Reference Manual

Simrad EK80
Scientific wide band echo sounder

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Simrad EK80

Wide band scientific echo sounder

Reference Manual

Release 2.0.0

The purpose of this manual is to provide the descriptions and procedures required to allow for safe and efficient use of the Simrad EK80. The manual also offers a thorough understanding of the various EK80 operational settings and adjustments.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

The information in this manual is also available in the EK80 context-sensitive *On-line help*.

395234/H

Document information

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit https://www.simrad.com. On this website you will also find a list of our dealers and distributors.

Kongsberg Maritime AS
www.kongsberg.com

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About this manual

The purpose of this manual is to provide the descriptions, procedures and detailed parameter explanations required to allow for safe and efficient use of the Simrad EK80. The manual also provides you with a thorough understanding of the EK80 parameters and adjustments.

Target audience

This manual is intended for all users of the EK80. Due to the nature of the descriptions and the level of detail provided by this manual, it is well suited for those who are - or wish to be - expert users. This manual is a reference book, and as such it is *not* intended for sequential reading. Use the table of content, the index, the search functionality as well as the interactive links to seek out the information you need when you need it.

A good understanding of system functions and controls is essential to fully take advantage of the functionality provided. Sea conditions vary, sometimes drastically. The acoustic conditions are also changing. Temperature and salinity layers differ from one day to the next, and from one position to another. It is not possible to identify settings that will provide the best data at all times. A careful study of the information in this manual is highly recommended, preferably while exploring the EK80 functionality.

We assume that you are familiar with the basic acoustic principles of sound in water. We also expect that you have some experience with multibeam, split-beam and/or single-beam echo sounders in scientific applications.

Use the Help button

Installed on your EK80 you will find a comprehensive context-sensitive online help system. Everything you can read in the EK80 Reference Manual can also be found in the online help. To open the context sensitive on-line help, select **Help** on the top bar, or the **Help** button in one of the dialog boxes.

Online information

All end-user manuals provided for operation and installation of your Simrad EK80 can be downloaded from our website.

- https://www.simrad.com/ek80

Our website also provides information about other Simrad products.

License information

The EK80 is a licensed product. In order to obtain a license, contact your local dealer.

Software version

This EK80 Reference Manual complies with software version 2.0.0.

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We want your feedback

We want to improve EK80 continuously. We also want our end-user documentation to be comprehensive and relevant. You can help. Please provide comments, suggestions or constructive criticism to any of our support offices.

Simrad EK80

Topics

Important

The EK80 is an advanced product. It is used with other advanced products. There is important information that you need to know.

Before you turn on the EK80

Before you turn on the EK80, make sure that the transducer is submerged in water. If you are using a drop keel, make sure that you have sufficient water depth to lower it.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

When the EK80 is not used

When you do not use the EK80, turn off the display and the Processor Unit. If you know that you will not use the EK80 for a long time, we recommend that you also switch off the transceiver(s).

When you are docking your vessel

You must never turn on the EK80 when the ship is in dry dock. The transducer(s) may be damaged if the EK80 transmits in open air. To prevent inadvertent use of the EK80, pull out the mains plug on the Processor Unit whenever your vessel is in dry dock. Additional precautionary measurers should be considered.

If something breaks down

If you believe that something has broken down, contact your local dealer. A list of all our dealers is provided on our website.

- https://www.simrad.com

If you are unable to contact a dealer, observe the support information in this publication.

When you want to turn off the EK80

You must never turn off the EK80 by means of the on/off switch on the Processor Unit. You must ALWAYS select **Exit** on the top bar.

Note

If you turn off the EK80 by means of the on/off switch on the Processor Unit you may damage the software and the interface settings used to communicate with external devices.

Rules for transducer handling

A transducer must always be handled as a delicate instrument. Incorrect actions may damage the transducer beyond repair. Observe these transducer handling rules:

- **Do not** activate the transducer when it is out of the water.
- **Do not** handle the transducer roughly. Avoid impacts.
- **Do not** expose the transducer to direct sunlight or excessive heat.
- **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer face.
- **Do not** damage the outer protective skin of the transducer face.
- **Do not** lift the transducer by the cable.
- **Do not** step on the transducer cable.
- **Do not** damage the transducer cable, and avoid exposure to sharp objects.

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System description

The Simrad EK80 is the most modern high-end split-beam scientific echo sounder in the scientific market. Based on more than 60 years of research and development in close collaboration with leading marine scientists this wideband echo sounder system has succeeded the famous EK60, which became an international standard for fish stock assessment.

The Simrad EK80 is the natural choice for modern research vessels and environmental monitoring installations requiring high quality scientific data for resource management and cutting edge research.

The EK80 supports hull mounting transducers, but it is also well suited for portable use. Pulses sweeping over a wide frequency band (FM) and the traditional discrete frequencies (CW) are available. Wide band sweeps provide long range without compromising target resolution. Continuous frequency responses over a wide band improve target identification and discrimination. Split beam calibration is implemented for both FM and CW modes.

Real time echo integration and target strength analysis in an unlimited number of layers is provided as well as storage of raw data for replay or analysis in one of several post-processing software packages. Several post-processing alternatives are available for survey analysis and reporting.

By means of a common and well documented RAW data format, EK80 data can be collected and integrated across a variety of acoustic platforms.

The Simrad EK80 can operate a large number of frequencies simultaneously ranging from 10 to 500 kHz. A wide selection of high quality accurate transducers is available.

The EK80 uses Microsoft® Windows® operating system. It can operate with single and/or split beam transducers, and provides you with a dedicated built-in application for calibration. The EK80 is specifically suited for permanent installation onboard a research vessel. It is still compact and a natural choice for portable use.

The Simrad EK80 is well suited for a number of applications:

- Assessment of fish biomass and distribution
- Species identification and discrimination
- Plankton research
- Habitat mapping
- Behavioral studies
- Environmental research
- Oil and gas detection

The echo sounder system is modular, and you can assemble any combinations of transceivers and transducers to fit your purposes. In a typical configuration, the EK80 comprises:

A Display

B One Processor Unit

C One or more transceiver units

D An Ethernet switch (if more than one transceiver is used)

E One or more single- or split beam transducers

The EK80 can work with several transceivers. This includes relevant hardware for acoustic Doppler current profiling (ADCP) operation.

Related topics

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System diagram

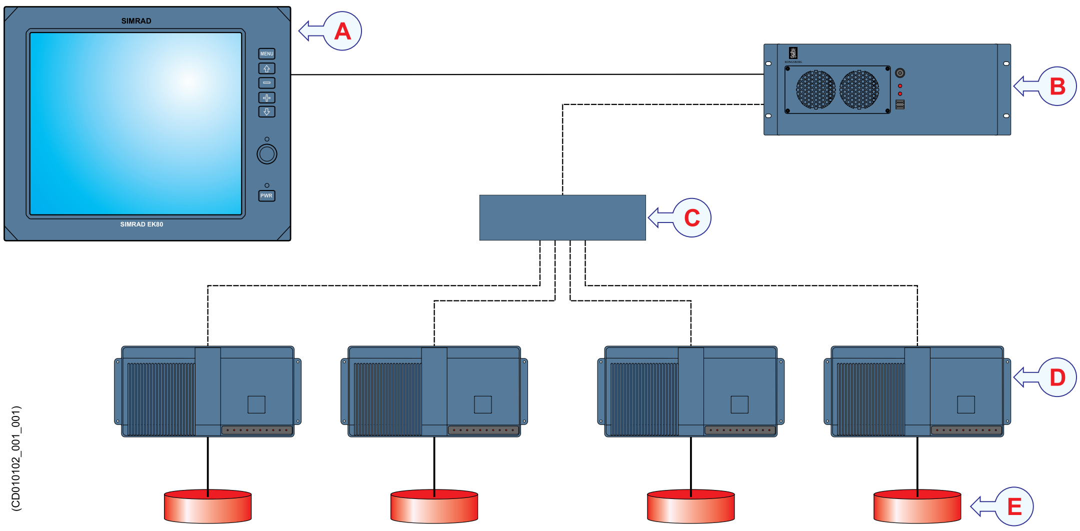
The system diagram identifies the main components of a basic EK80 system. Only the main connections between the units are shown. Detailed interface capabilities and power cables are not shown.

In this publication, the computer is referred to as the Processor Unit.

Basic system

The basic Simrad EK80 Wide band scientific echo sounderconsists of one transducer, one Wide Band Transceiver (WBT) and one Processor Unit. Additional transceivers and transducers can be added to meet your operational and functional requirements. Post-processing software is provided by third-party suppliers. See our website for more information.

Unless otherwise specified in a contract, the display and the Ethernet switch are not included in the standard delivery from Kongsberg Maritime. These are commercial items that can be purchased locally.



A *Display*

B *Processor Unit*

C *Ethernet switch*

D *Wide Band Transceiver (WBT)*

E *Transducers*

System with acoustic Doppler current profiler (ADCP) functionality

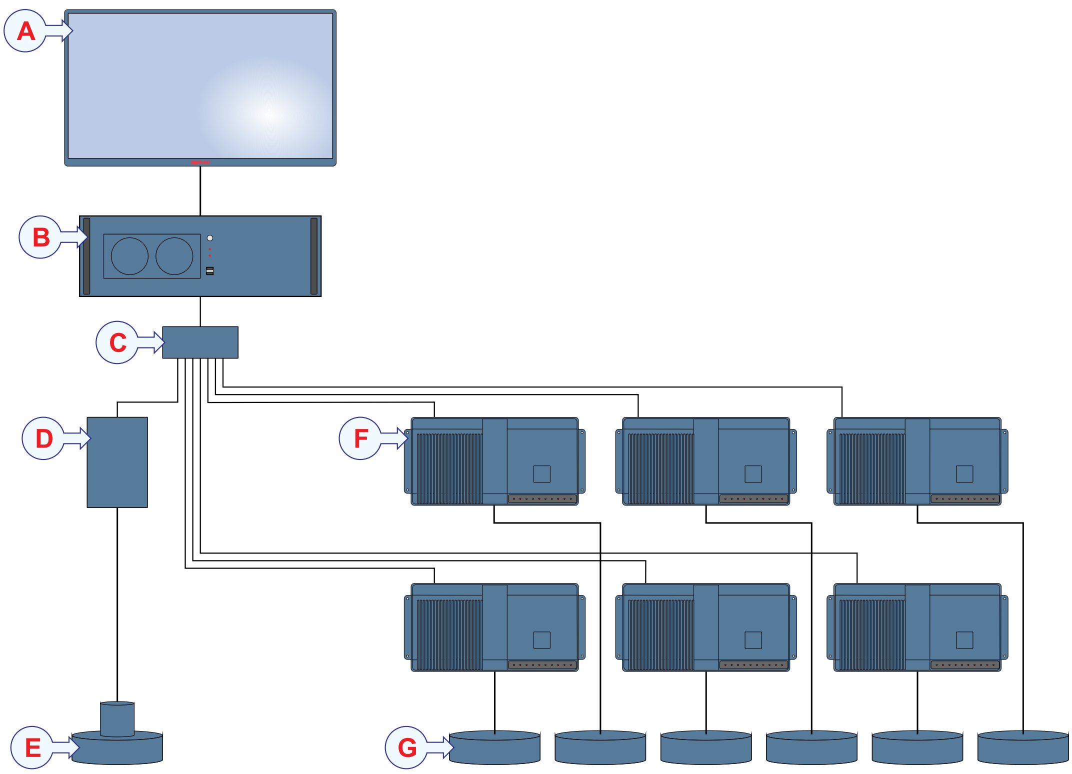
The EK80 can be expanded by adding dedicated hardware for acoustic Doppler current profiler (ADCP) measurements. The following ADCP systems are currently supported:

- Simrad EC150-3C

The Simrad EC150-3C is a 150 kHz phased-array transducer designed for current profiling applications. It offers 2.8 degrees beamwidth for accurate current profiling and 2.5 degrees beamwidth when applied as a split-beam echo sounder transducer. The EC150-3C housing includes the required transceiver circuitry.

The EC150-3C is a dual purpose unit. It can be used *either* as an acoustic Doppler current profiler (ADCP) instrument to measure water current *or* as a split-beam echo sounder. It can not operate these two functions simultaneously.

The ADCP hardware can be added to an existing EK80 system. You can also use the EK80 as an exclusive ADCP instrument.



A *Display*

B *Processor Unit*

C *Ethernet switch*

D *Power Supply Unit*

E *Simrad EC150-3C*

F *Wide Band Transceiver (WBT)*

G *Transducers*

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Main system units

Topics

Display description

A display is a required part of the EK80 Wide band scientific echo sounder. For best readability, the display must be protected from glare and have the correct height and angle.

Any commercial display can be used with the EK80 Wide band scientific echo sounder, provided that the display meets the minimum requirements.

You may wish to see many echogram channels simultaneously. A large display with high resolution is then useful. The EK80 software supports all display sizes. The visual quality of the EK80 presentation depends on the quality of your graphic adapter and display.

Note

The display is not a standard part of the EK80 delivery. This is a commercial item that can be purchased locally.

The chosen display must be designed for maritime use, and it must meet the minimum performance specifications. You must also make sure that the chosen display supports the video formats provided by the Processor Unit. Kongsberg Maritime may provide a suitable display.

Tip

Many computers have two video ports. Two displays can therefore be used to see the EK80 presentations. You can place the two displays next to each other. You can also choose to place the second display at another location on the vessel.

The presentation on the second display is controlled using the operating system features on the Processor Unit.

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Processor Unit description

The Processor Unit is the computer that controls the EK80 system. It is a vital part of the EK80 Wide band scientific echo sounder. The Processor Unit contains the operational software, and offers the user interface that allows you to control the EK80. Furthermore, it offers a number of serial and Ethernet lines for communication with external devices. In this publication, the computer is referred to as the Processor Unit.

A dedicated maritime computer is provided with the EK80 Wide band scientific echo sounder. It is set up with all necessary software. The Processor Unit is normally mounted on the bridge.

The Processor Unit is designed for rugged maritime use. It has been customized by Kongsberg Maritime. Except from the fans, it contains no moving parts. The computer is based on a commercial design, but the software and hardware have been specified by Kongsberg Maritime to suit the EK80 requirements. The Processor Unit cabinet is placed on shock absorbers.

The Processor Unit is based on the Microsoft® Windows 10 operating system.

The computer offers multiple USB ports for use with future software upgrades. These USB ports also allow you to export screen captures from the EK80.

Note

The operating system has been modified to make the computer work with the EK80. These modifications include removal of all safety features provided by Microsoft®. The built-in firewall and all virus protection features have been removed. Any attempt to use the computer for any other purposes than EK80 operation, such as games, desktop applications and Internet connection, may result in serious damage to the program. Such damages are not covered by the warranty.

The EK80 design supports two displays. This can be a practical solution. You can place the two displays next to each other. You can also choose to place the second display at another location on the vessel.

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Ethernet switch description

A high capacity Ethernet switch is a key component of the EK80 system.

If you use more than one Wide Band Transceiver (WBT), a high capacity Ethernet switch is required. The Ethernet switch is used to connect each Wide Band Transceiver (WBT) to the Processor Unit.

Related topics

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Wide Band Transceiver (WBT) description

The EK80 Wide Band Transceiver (WBT) is provided to transmit acoustic energy through water. This transmission and reception are commonly referred to as a *ping*. After each transmission, the transceiver receives the echoes from the targets in the water and/or the seabed. These echoes are filtered and amplified and then converted into digital format.

The EK80 software supports several different transceiver units. Several transceivers may be used simultanously.

Wide Band Transceiver (WBT)

The Wide Band Transceiver (WBT) comprises a rugged box providing all necessary transmitter and receiver electronics. The receiver is designed for low noise, and it can handle input signals spanning a very large instantaneous dynamic amplitude range. All targets are correctly measured. The transceiver operates within a large frequency band, and supports single frequencies, frequency sweep (chirp) and user defined wave forms.

The Wide Band Transceiver (WBT) is designed for applications where performance is the top priority. It has four 500 W channels that can either work independently with single beam transducers, or together with a split beam transducer. The design is optimized for applications where power consumption and physical size is not critical.

A high quality Ethernet cable connects the Wide Band Transceiver (WBT) to the Processor Unit. The distance between the Processor Unit and the transceiver can be extended up to maximum 70 meters. If a longer cable is required, cut it in half, and insert an Ethernet switch to provide buffer amplification.

The Wide Band Transceiver (WBT) requires an external power supply offering 12 to 15 Vdc, minimum 5 A. A suitable power supply is provided with the delivery. The transceiver can also be powered by a large capacity battery.

Note

If more than one Wide Band Transceiver (WBT) is used, a small high capacity Ethernet switch is required to connect the transceivers to the Processor Unit.

WBT Mini

The WBT Mini is a compact version of the highly efficient Wideband Transceiver (WBT) used by marine research vessels all around the world. Typical deployments include portable echo sounders and any other surface platforms that may benefit from its compact size and energy-efficient design. The WBT Mini has a small size, high capacity and low power consumption, and - as an option - autonomous operation.

The transceiver electronics in the WBT Mini have the linear FM (chirp) and CW pulse forms similar to the Wideband Transceiver. It contains four individual transceiver channels with multiplexing functionality. This allows for great flexibility when you set up a system with various split-beam or single-beam transducer configurations.

The WBT Mini is contained in a splash-proof cabinet. The robust design allows long-term deployment in challenging environments. The WBT Mini requires an external power supply.

WBT Tube

The WBT Tube is a compact version of the highly efficient Wide Band Transceiver (WBT) used by marine research vessels all around the world. The WBT Tube is contained in a pressure rated tube. It is designed for long term use down to 4000 m water depth. Typical deployments include buoys, subsea structures for environmental monitoring, autonomous underwater vehicles or unmanned surface vehicles.

The shape and pressure rating makes the WBT Tube an ideal solution for subsea structures with multiple sensors.

The transceiver electronics in the WBT Tube have the same linear FM (chirp) and CW pulse forms as the Wide Band Transceiver. It contains eight individual transceiver channels with multiplexing functionality. This allows for great flexibility when you set up a system with various split-beam or single-beam transducer configurations.

The WBT Tube requires an external power supply. Two versions are available, one for 15 VDC operation ,and one for or 24 VDC.It communicates with the computer using a high speed Ethernet line.

Related topics

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Transducer description

The EK80 Wide band scientific echo sounder can be used with all our single-beam and split-beam transducers.

Kongsberg Maritime can provide a wide range of efficient and accurate Simrad transducers for the EK80 Wide band scientific echo sounder. A large number of operational frequencies is available.

All our transducers are designed to work optimally across a large bandwidth and in demanding environments. For scientific echo sounders, we divide the features of the transducers into three main categories; split-beam, wideband and depth-rated. Several transducers fit into more than one category.

For more information about our transducers, see our website.

- https://www.simrad.com

Related topics

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Simrad EC150-3C

The Simrad EC150-3C is a 150 kHz phased-array transducer designed for current profiling applications. It offers 2.8 degrees beamwidth for accurate current profiling and 2.5 degrees beamwidth when applied as a split-beam echo sounder transducer. The EC150-3C housing includes the required transceiver circuitry.

The EC150-3C is delivered with a power supply unit and an open-ended cable. The transducer cable is 40 metres long. One end of the cable is connected to the transducer. The other end is terminated in the power supply.

Note

The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Related topics

Main system units, page 26
System diagram, page 23

Network security

If a EK80 system is connected to a local area network, data security is important.

Equipment manufactured by Kongsberg Maritime is frequently connected to the vessel's local area network (LAN). When you connect a computer to a local area network you will always expose the data on that computer. All other computers connected to the same network may be able to access your data. Several threats may immediately occur:

- Remote computers can read the data.
- Remote computers can change the data.
- Remote computers can change the behaviour of the computer, for example by installing unwanted software.

Usually, two parameters are used to define the threat level:

1. The likelihood that any remote computer will do any of the above.
2. The damage done if a remote computer succeeds doing this.

Kongsberg Maritime has no information regarding the complete system installation on any vessel. Systems provided by Kongsberg Maritime are regarded as stand-alone offline systems. They are stand-alone even though they may be connected to a network for sensor interfaces and/or data distribution.

Note

No network safety applications are installed on Kongsberg Maritime computers. The computers are therefore not protected against viruses, malware or unintentional access by external users.

Securing the EK80 system itself has no meaning unless there is a policy in place that secures all computers in the network. This policy must include physical access by trained and trusted users. The customer/end user of the EK80 system will always be in charge of defining and implementing a security policy, and providing the relevant network security applications.

Note

Kongsberg Maritime will not accept any responsibility for errors and/or damages caused by unauthorized use of or access to the EK80.

Related topics

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Support information

If you need technical support for your Simrad EK80 you must contact your local dealer, or one of our support departments. A list of all our offices and dealers is provided on our website. You can also contact our main support office in Norway.

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Related topics

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Getting started

Topics

Starting normal operation

Topics

Turning on the EK80

In order to use the EK80, you must first turn it on. You must first turn on the display, the Processor Unit, the transceiver(s), and the Ethernet switch (if applicable). After this you can start the EK80 program.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. Minimum one transceiver with one or more transducers has been connected. All relevant navigation sensors are operational.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Make sure that each transceiver is turned on.

2 Turn on the display and the Processor Unit, and start the EK80 program.

3 Once the EK80 program has started, observe that the presentation fills the entire screen.

4 On the **Main** menu in the top right corner of the presentation, select **User Settings**, and then choose the default settings.

5 At the bottom of the **Main** menu, observe that the **Operation** icon is flashing.

The icon is flashing to indicate that even if the EK80 is turned on, "pinging" is disabled. **Ping** is set to *Off* to prevent transmission ("pinging"). This is for safety reasons.

Related topics

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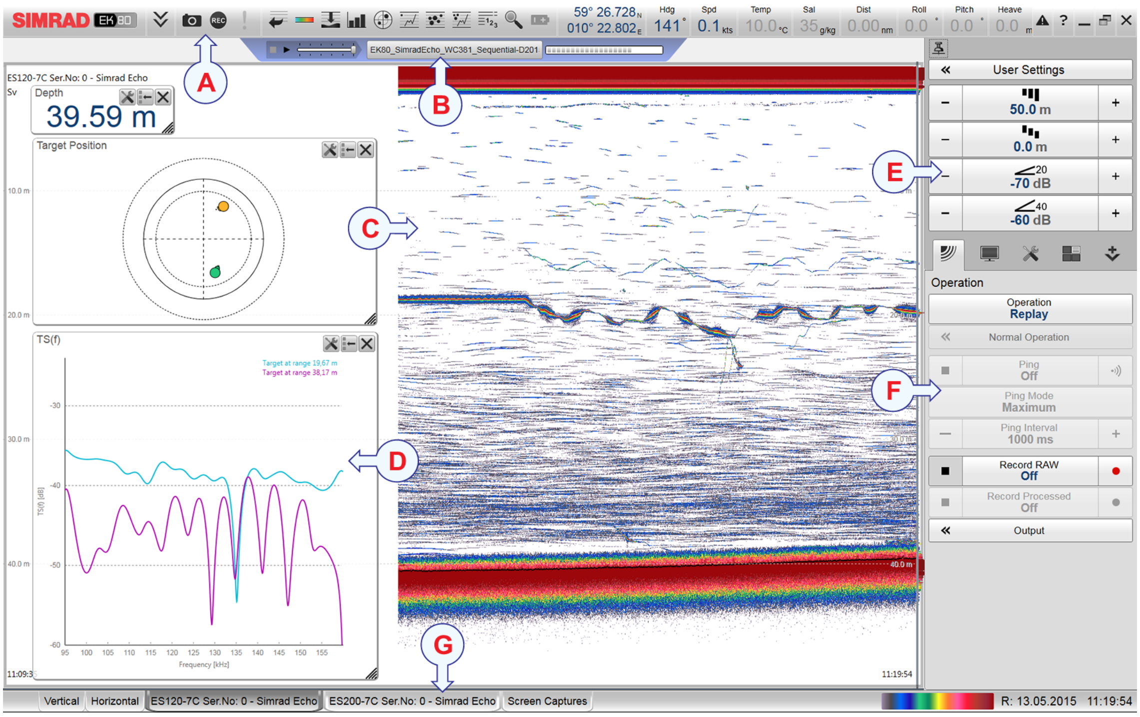
Getting to know the user interface

The EK80 consists of specific visual elements that work together. The visual elements provide you with the echo information you need, they help you to control the functionality needed to understand this information, and finally, they allow you to control the operational parameters. By default, the EK80 presentation covers the entire screen.



A *Top bar*

B *Replay bar*

C *Echogram view*

D *Information panes*

E *Main menu*

F *Secondary menus*

G *Bottom bar*

Procedure

1 Move the cursor to the top bar, and investigate the functions provided.

Observe that small tooltips open to identify the various functions you can use.

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

2 Observe the information pane "buttons" on the top bar.

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. Before you open an information pane, you must first click in an echogram view to make it "active".

3 Move the cursor to the menu system on the right side of the EK80 presentation.

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Below the **Main** menu, a set of dedicated icons are used to open the secondary menus. Select the icon one more time to close the menu.

4 Move the cursor to the bottom of the EK80 presentation.

The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

5 Move the cursor to the bottom of the EK80 presentation.

The bottom bar is located at the bottom of the EK80 presentation and stretches from the far left to the far right. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

6 Move the cursor to the echogram views in the main EK80 presentation.

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

7 Click inside one of the echogram views.

Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Observe that the border lines of the active view are drawn with a thicker line.

Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to *all the views* simultaneously.

Related topics

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Checking transceiver and transducer settings

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. It is often useful to verify that all the channels are properly set up. This is a requirement for the EK80 performance.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. The EK80 system is turned on and operates normally. Minimum one Wide Band Transceiver (WBT) with one or more transducers has been connected.

Context

If you are using a EK80 that has been in use for some time, you can safely assume that the transceivers and transducers have been set up properly. However, the procedure may prove useful if you are an inexperienced user. Make sure that you do not change any important settings.

Note

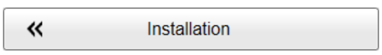
When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 Make sure that the currently connected transducer(s) are shown as "tabs" at the bottom of the EK80 presentation.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side, select **Transducer Installation**.

On the **Installed Transducers** list, select one of the transducers. Observe that the **Transducer** page opens with all settings unavailable. This is a safety precaution to prevent unintentional changes to the transducer settings. To make any changes, you must select **Edit**.

5 Make sure that each transducer has been installed with all settings defined.

The physical location of the EK80 transducer is important for the EK80 data accuracy. The offset value for "X" defines the vertical location (the depth) of the transducer face.

This is the installation depth of the transducer; the vertical location of the transducer face relative to the water surface. In order to measure correct water depth, the EK80 needs to know the vertical distance between the vessel's water line and the acoustic face of each transducer. The depth of each individual transducer must be defined manually. Enter the depth as a positive number. If the displacement of your vessel changes considerably, you may consider changing this parameter often. For accurate location of the transducer, you need the detailed vessel drawings.

6 On the left side of the **Installation** dialog box, select **Transceiver**.

Observe that the **Transceiver Installation** page opens.

7 Make sure that all applicable transceivers and transducers are connected and operational.

For each transceiver, this is indicated by the green label with text "Installed".

8 Close the **Installation** dialog box without making any changes.

Selecting *Normal* mode to start "pinging"

In order to transmit ("ping") you must set the EK80 to *Normal* operating mode.

Context

The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*. *Normal* mode allows the EK80 to transmit ("ping") through the water, and to receive the echoes.

The transmission ("pinging") from the EK80 can be turned on or off. The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

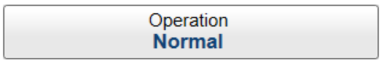
Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Normal*.



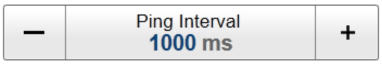
The EK80 is now ready for use.

3 Set **Ping** to *On*.

The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

4 Set **Ping Mode** to *Interval*.

5 Select either side of the button to choose a value.



Specify the ping rate that has been defined for the survey.

Result

The EK80 is now transmitting acoustic pulses ("pinging") into the water.

Further requirements

When the EK80 starts, it is very important that it detects the bottom correctly. In most cases this will take place automatically. However, we have experienced that large schools of fish or difficult bottom conditions have deceived the EK80 to display the wrong depth. In these cases the sounder may display the bottom at 0.0 metres at the top of the fish school. In order to aid the EK80 to locate the correct depth, you must adjust to bottom maximum and minimum ranges according to the actual bottom depth.

Related topics

Starting normal operation, page 35

Verifying that the bottom is correctly detected

Locating the bottom is important for the EK80. The EK80 needs this *bottom lock* to locate the correct depth, and to stay on it during the operation, even if the depth changes continuously. Occasionally, difficult environmental, water or bottom conditions may inhibit a *bottom lock*.

Context

The **Bottom Detection** parameters provide separate limits for minimum and maximum depth. These limits may be used to obtain a *bottom lock* on the depth when the EK80 is transmitting. The **Bottom Backstep** parameter allows you to manually modify where on the bottom echo the depth will be detected.

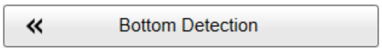
Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

Procedure

1 Open the **Active** menu.

2 Select **Bottom Detection**.



Tip

The bottom detection parameters are also found as a page in the **Information Pane Options** *dialog box. To open the* **Information Pane Options** *dialog box, select the button on the* **Active** *menu. To open the page, you can also select* **Setup** *in the Depth information pane.*

3 Set **Minimum Depth** and **Maximum Depth** to values fit for the depth at your current location.

- The **Minimum Depth** setting eliminates all unwanted bottom detections from the transducer face and down to the depth you have chosen.
- Set the **Maximum Depth** to approximately 50 % more than the expected depth.

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The EK80 will not detect the bottom at all, and the displayed depth will be 0.00 m.

Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

4 Select **OK** to save the selected settings and close the dialog box.

Result

If the EK80 should loose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined.

Related topics

Starting normal operation, page 35
Basic operation, page 44

Checking and/or editing the transceiver parameters

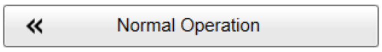
The **Normal Operation** dialog box lists all the transmission parameters. The dialog box provides one row for each channel in use. You can change the parameters.

Prerequisites

This procedure assumes that the EK80 system is turned on and operates normally. The **Normal Operation** dialog box is only available when the EK80 operates in *Normal* mode.

Procedure

1. On the **Operation** menu, open the **Normal Operation** dialog box.

2. For each channel:

   a. Set **Pulse Type** to a *LFM* or *CW* mode as permitted by your license and the transducer.

   b. Set **Mode** to *Active*.

   c. Set **Pulse Duration** to your chosen value.

   d. Set **Power** to the correct power level for the transducer.

   e. For the relevant channel, set **Start Frequency** and **End Frequency** to values permitted by your transducer.

   In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

3. Close the dialog box.

Related topics

Starting normal operation, page 35
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Turning off the EK80

You must never turn off the EK80 by means of the on/off switch on the Processor Unit. You must always close the EK80 program by selecting **Exit** on the top bar.

Context

When you do not use the EK80, turn off the display and the Processor Unit. If you are not using the EK80 for a long period of time, we recommend that you turn off the Wide Band Transceiver (WBT). Use the on/off switch on the power supply, or disengage the circuit breakers.

Procedure

1 Select **Exit** on the top bar.

   Observe that the EK80 program closes down.

   Tip

   If the EK80 Processor Unit is used as a server with one or more clients connected, a relevant message will appear. We recommend that you turn these clients off first. Closing down the EK80 program with clients connected will take longer time.

2 If the Processor Unit does not turn itself off automatically, use the functionality provided by the operating system to turn it off manually.

3 Turn off the display.

   If required, refer to the instructions provided by the display manufacturer.

4 Turn off each transceiver.

   The Wide Band Transceiver (WBT) is not fitted with an on/off switch. You can leave the unit permanently turned on. If you are not using the EK80 for a long period of time, disconnect the power supply.

Related topics

Starting normal operation, page 35

Basic operation

Topics

Selecting which echogram type to use

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** dialog box.

Prerequisites

This functionality is not relevant when ADCP is activated.

Context

Use this function to select what kind of echogram you wish to see in the current (active) view.

- *Surface*: A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.
- *Bottom*: A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.
- *Pelagic*: A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.
- *Trawl*: The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

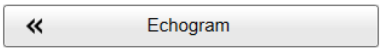
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Echogram** to open the page.

5 Under **Echogram Type** select the type you wish to apply to the chosen view.

6 Apply the change(s) you have made.

   a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

   b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Further requirements

If necessary, adjust the **Range** and **Start Range** settings accordingly.

Related topics

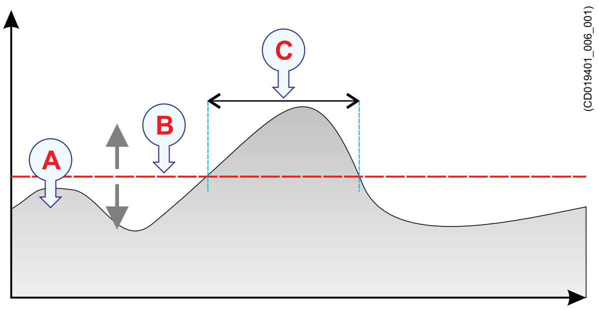
Basic operation, page 44
Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Echogram page, page 735

Adjusting the minimum level (echo sensitivity)

On the EK80 you do not change the actual gain in the receiver, but the minimum level of the colour scale. When the numerical dB level is *decreased*, the weaker echoes will start to appear in the echogram. This does not happen because the signal amplification is increased, but because the "visual sensitivity" has been improved.

Context

There are two minimum level buttons, one for each TVG setting (*20 log R* and *40 log R*). Each of these will only work on echograms with the same TVG setting.



The echo strength (A) changes with time. The Minimum Level (B) is adjusted up or down. Reducing the Minimum Level setting will increase the sensitivity. Only echoes over the Minimum Level will be shown (C).

The setting is by default only applied to currently selected echogram. It is identified with a thick border. Several echogram types are available. To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** dialog box.

Do not confuse this **Minimum Level** setting with the **TVG** (Time Varied Gain) setting.

Procedure

1 Observe the **Main** menu.

2 Locate the **Minimum Level** button.

3 Make the necessary adjustment.

The following methods can be used to adjust this setting:

- Select [+] or [-] to choose the level.
- Select the middle of the button and keep the mouse button pressed. Drag the cursor sideways to increase or decrease the level.
- Select the middle of the button to open the menu. Type the requested value. (You can only do this if you have computer keyboard connected to your Processor Unit.)

Related topics

Basic operation, page 44

Choosing the depth range and the start depth for the echograms

In each echogram, the start depth is defined by the **Start Range** depth value. This is the "upper limit" of the echogram. The range from this start depth and down is defined by the **Range** value.

Context

The **Range** setting defines how "deep" you wish the EK80 to detect echoes. In other words, this is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies the "bottom" depth, while the **Start Range** setting specifies the "top" depth. The way the **Range** and **Start Range** settings work depends on the echogram type.

- *Surface*: A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.
- *Bottom*: A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.
- *Pelagic*: A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.
- *Trawl*: The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

Procedure

1 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

2 Locate the **Start Range** function.

3 Make the necessary adjustment.

The following methods can be used to adjust this setting:

a Select [+] or [-] to choose the requested setting.

b Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

c Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

4 Locate the **Range** function.

5 Make the necessary adjustment.

The following methods can be used to adjust this setting:

a Select [+] or [-] to choose the requested setting.

b Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

c Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

Example

In a surface echogram, set the **Start Range** value to 0 metres. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 metres. The echogram will now show the area from the sea surface and down to 20 metres "below" the sea bottom. The sea bottom contour is easily detected when the depth changes.

In a bottom echogram, set the **Start Range** value to –5 metres. This will make the echogram start from 5 metres above the sea bottom. Set **Range** to the 5 metres plus 10 = 15 metres. The echogram will now show the area from 5 metres above the depth, and down to 10 meters "below" the sea bottom. The sea bottom contour will appear as a flat line.

Related topics

Basic operation, page 44

Choosing the colours used to present the echograms

Several different colour scales are predefined and available for the presentation of echograms. You can easily choose which colours to use. The presentation colours have no effect on the operational performance of the EK80. The **Colour Setup** dialog box controls the presentation colours used by the EK80. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation

Context

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

Tip

By default you have 64 or 12 colours available to present the echoes, and a selection of palettes. The colour scale can be retrieved any time by selecting **Colour Scale** *on the top bar. The chosen colours are shown at the bottom of the EK80 presentation.*

If you choose to use many colours, the resolution of the EK80 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Tip

You can adjust the echo level range by means of the **Colour Scale** *settings. These are opened from the Colour Scale information pane. You can find the same settings in the* **Information Pane Options** *dialog box on the* **Active** *menu.*

The following colour scales are available:

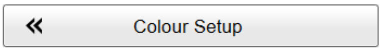
12 Colours **Sonar Colours** **Smooth ES** **Grayscale** **BI500 Colours**

The **Smooth Echosounder** scale is based on the standard 12-colour scale. Additional colours have been added between them to make smoother colour transitions.

Procedure

1 Open the **Display** menu.

2 Select **Colour Setup**.



3 Select the number of colours you want to use.

Note

If you want to apply one of the predefined colour scales, you must select 64 colours.

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4 Select the colour scale you want to use.

5 At the bottom of the dialog box, select **Apply** to preview your choice(s).

6 Select **OK** to close the dialog box.

Related topics

Basic operation, page 44

Opening the context-sensitive online help

Installed on your EK80 you will find a comprehensive context-sensitive online help system. Everything you can read in the EK80 Reference Manual can also be found in the online help. The online help can be opened from all dialog boxes in the EK80 user interface. You can also use the **Help** button on the top bar.

Context

To open the online help on its start page, select **Help** on the top bar. To read about a dialog box and the options provided, select the **[?]** button in its top right corner.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Note

The EK80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

Procedure

1 Select **Help** on the top bar.

The online help opens on its start page. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

2 Select **Help** in the top right corner of each dialog box.

The description of the relevant dialog box opens. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

Related topics

Basic operation, page 44
Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105

Defining the file and folder settings for raw data recording

The EK80 allows you to record both raw and processed echo data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1. Open the **Operation** menu.
2. Select **Output**.

   

   Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.
3. In the **Output** dialog box, select **File Setup**.
4. On the **File Setup** page, define the recording parameters.
   a. Define the output directory for the recorded files.

      In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.
   b. Define a file name prefix.

      By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey.
   c. Define the maximum amount of bytes to be contained in one data file.

      Select **Maximum** for 1 GB file size.

      The current size of the RAW data file is displayed during data recording. If the current file size gets too big during recording, select **Split File** on the **Record RAW** button. **Record RAW** is located on the **Operation** menu.
   d. Specify the raw data recording parameters.

      The **Range** setting defines the vertical or horizontal distance from where the echo presentation starts to the end of the search area.

- Select **Common** to use the same recording range for all your active channels.
- Select **Auto** to allow the EK80 to automatically find the required range value.
- Select **Individual** to use the different recording ranges for your active channels.

The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

- Select **Complex samples** to use the default data format.
- Select **Power/Angle** to reduce the file sizes.
- Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

The **Motion Data Recording** function allows you to control how often the motion data are saved in the raw data file.

5 At the bottom of the page, select **Apply** to save your settings.

6 Select **OK** to close the dialog box.

Related topics

Basic operation, page 44

Defining the file and folder settings for processed data recording

The EK80 allows you to record processed data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined. You can also define the which file format to use.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 On the **File Setup** page, define the relevant file and folder properties.

5 On the left side of the **Output** dialog box, select **Processed Data Output** to open the page.

6 Specify the recording parameters.

a Select an output type from the list.

Observe that the **Processed Data Output Configuration** dialog box opens to record the relevant settings for the chosen output format.

b Select the settings for the chosen output format.

- The output destination has been previously selected on the **File Setup** page.
- Select the channel to be used as source for the information. You can only choose from the channels that have already been installed. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Note

Note that some formats will not allow you to create an output file.

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c Select **Add** to save the output format.

7 At the bottom of the **Output** dialog box, select **OK** to save the chosen parameters and close it.

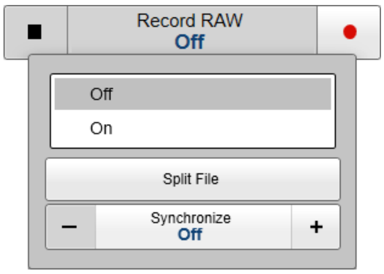
Related topics

Basic operation, page 44

Recording raw data

Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. You can save the data to the Processor Unit hard disk, or onto an external storage device. If your Processor Unit is connected to a local area network, you can also save to a network disk. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record RAW** function.

Prerequisites



Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page. The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Context

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.
- Use **Record RAW** on the **Operation** menu to record raw data. To play back data, use **Operation** to select *Replay* mode.This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer". These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. To open the *History* information pane, select the button on the top bar.
- Use **Record Processed** on the **Operation** menu to record processed data. This is only an export format. Processed data files can not be played back on the EK80.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Procedure

1 Open the **Operation** menu.

2 To start data recording, open the **Record RAW** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

The **Record** indicator on the top bar changes its colour to reflect that recording is active.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

3 If you wish to reduce the size of the data file you are recording, click the middle of the **Record RAW** button to open it, and select **Split File**.

The current file is closed, and a new file is automatically started.

4 To stop recording, open the **Record RAW** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

Basic operation, page 44

Recording processed data

The processed data recording function provided by the EK80 allows you to save processed data on a selected format. The data files can be copied or moved to an external storage device, or to another computer on the network. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record Processed** function.

Prerequisites

Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page.

The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Before you start recording, you must also define which output format(s) you wish to use. To choose which processed data formats to record, select **Processed Data Output**. The **Processed Data Output** page is located in the **Output** dialog box.

Context

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar.
- Use **Record RAW** on the **Operation** menu to record raw data.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer".
- Use **Record Processed** on the **Operation** menu to record processed data.

  This is only an export format. Processed data files can not be played back on the EK80.

Note

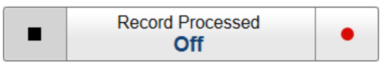
The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Procedure

1 Open the **Operation** menu.

2 Make sure that the **Record Processed** function is available.



If the **Record Processed** function is unavailable, it is most likely because you have forgotten to specify an output format.

a On the **Operation** menu, select **Output**.

b On the left side of the **Output** dialog box, select **Processed Data Output** to open the page.

c Select **New** in the **Installed Outputs** area.

d Select an output type from the list.

e Select the settings for the chosen output format.

f Select **Add** to save the output format.

g At the bottom of the **Output** dialog box, select **OK** to save the chosen parameters and close it.

3 To start data recording, open the **Record Processed** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

4 To stop recording, open the **Record Processed** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

Basic operation, page 44

Target strength calibration summary

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly. We strongly recommend that calibration surveys are done at regular intervals. As a minimum, calibration must be done prior to each survey. A summary of the target strength calibration process is provided.

Prerequisites

In order to calibrate the EK80, the following equipment is required.

- Calibration spheres: The calibration spheres must be chosen to match the operational frequencies used by the EK80 system.
- Winch arrangement: The winch arrangement must provide the necessary lines to lower the sphere into the sound beam.

The vessel must be anchored in a suitable position with sufficient depth, calm and sheltered water, and minimum sea currents.

Note

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies. Each sphere diameter is selected for minimum temperature dependence.

Context

We strongly recommend that calibration surveys are done at regular intervals. As a minimum, calibration must be done prior to each survey.

Note

Calibration must be taken seriously. To achieve the best results, the calibration must be planned and done carefully.

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly.

In this context, the transducer beam is conically shaped with a cross-section area increasing with the depth. The cross-section is divided into "slices", and each slice represents a sector in the transducer. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

Any adjustments to the EK80are done automatically by the calibration program. No gain adjustments are required.

Note

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process. To select Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

If you have a EK80 system with several transceivers, you must calibrate one by one.

Procedure

1 Prepare the vessel for EK80 calibration.

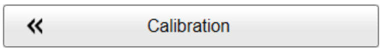
2 On the **Operation** menu, set **Operation** to *Normal*.

3 In the **Normal Operation** dialog box, set up the operating parameters for the channel you wish to calibrate.

4 Lower the sphere into the beam at the specified depth. Verify that the echoes are clearly detected.

5 On the **Operation** menu, open the **Record RAW** button, and select *On*.

6. On the **Setup** menu, select **Calibration**.



7. On the first page of the wizard, select **New calibration from raw data (Real time or Replay)**.
8. Select **Next** to continue.
9. On the *second* page of the wizard:
   a. Select the channel to be calibrated.
   b. Select **Next** to continue.
10. On the *third* page of the wizard:

    Select the sphere to use in target strength calibration. You can also add a new sphere if it is not listed.
11. On the *fourth* page of the wizard:
    a. Make the necessary preparations to record calibration data.
    b. Select **Start** to start echo data import.
    c. When the appropriate number of echoes have been imported, select **Stop**.
    d. Stop the recording.
    e. Select **Save** or **Save As** to save the calibration data.
    f. Select **Next** to continue.
12. On the *fifth* page of the wizard:
    a. Remove the echoes you do not wish to use in the calibration.
    b. Select **Reprocess** to run the calibration processing.
    c. Select **Save** or **Save As** to save the calibration data.
    d. Update the calibration used by the echo sounder using **Merge** or **Replace**.
13. Stop raw data recording.
14. Close the **Calibration Wizard** dialog box, and resume normal operation.

Further requirements

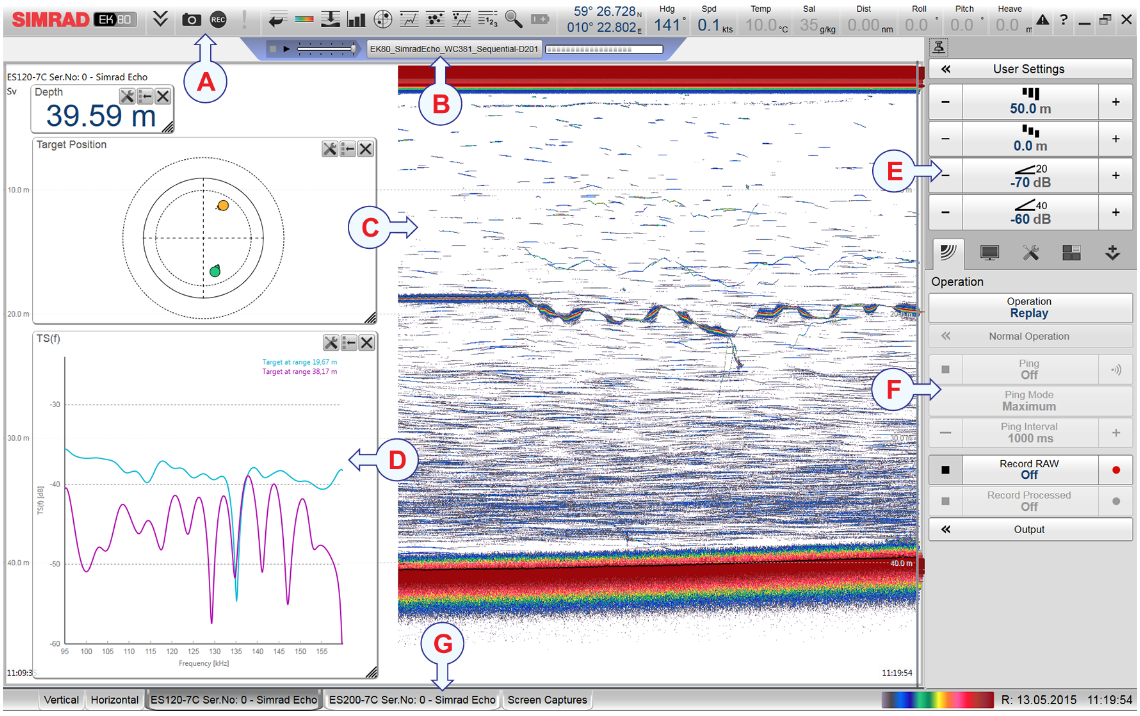
Repeat the procedure for each channel you wish to calibrate.

User interface introduction

Topics

EK80 user interface familiarization

By default, the EK80 presentation covers the entire screen. The visual elements provide you with the echo information you need, they help you to control the functionality needed to understand this information, and finally, they allow you to control the operational parameters.



This EK80 screen capture shows you a typical data replay situation. You can see one echogram view, and several information panes. The top bar shows you navigational information as well as buttons for key functions and information panes. The menu system on the right side gives you easy access to all the functionality offered by the EK80.

A Top bar

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

B Replay bar

During replay, the dedicated replay bar is shown immediately under the top bar. The replay bar allows you to retrieve saved files, and to control the playback.

C Echogram views

By default, you have one echogram for each frequency channel. You can choose which type of echogram you wish to see. If you have more than one frequency channel, the echograms for each channel can be presented horizontally with one over the other, or vertically next to each other. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D Information panes

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. You can change the appearance of the information panes to suit your preferences. You can change the transparency and the physical size of each pane.

E Main menu

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. By default, the **Main** menu is open. It is placed on the right side of the EK80 presentation. On the top bar, use the **Menu** button to hide or show the menu.

F Secondary menus

Below the **Main** menu you find the icons for opening (and closing) the secondary menus. Select an icon to open the relevant menu, and reselect the icon to close the menu.

G Bottom bar

The bottom bar is located at the bottom of the EK80 presentation and stretches from the far left to the far right. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

Related topics

User interface introduction, page 60

Echogram views

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open.

Supported echogram types

- *Surface*

  A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.

  Since this echogram is referenced to the sea surface, the sea bottom contour will vary with the actual depth. If you set up the **Start Range** and **Range** depths to place the sea bottom contour at the lower end of the echogram, you will have good opportunity to study the echoes from the water column.

  In the surface echogram, all calculations are made from the sea surface and down to the detected sea bottom. Use this echogram type to obtain correct calculation of the biomass. It will also provide valid data for the *Target Strength Histogram* information pane.

- *Bottom*

  A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.

  Since this echogram is referenced to the sea bottom, the sea surface will vary with the actual depth, while the bottom is drawn flat. This makes it easy to study the echoes from the sea bottom. You can investigate the sea bottom conditions and hardness, and detect fish.

  The echogram is only drawn for pings that have a successful bottom detection.

- *Pelagic*

  A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.

  Pelagic echograms are useful when you work in deeper waters. The reduced range and the fact that you do not need to wait for the bottom echo means that the EK80's ping rate is increased.

  In a *Pelagic* echogram the calculations disregard any bottom detection. All calculations are based on the entire echogram shown in the view. If the bottom echo is present in the echogram, the biomass calculation will be wrong.

- *Trawl*

  Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals.

  This information is required for the trawl echogram to be generated. The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope. In addition to the trawl opening, the echogram covers a certain range over and under the trawl opening.

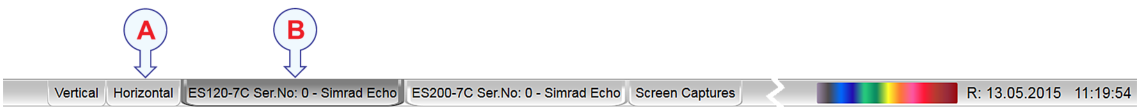
The biomass calculations in a *Trawl* echogram are not restricted by the bottom detection. This means that the bottom echo will be included in the calculations if it appears within the chosen range.

The echogram is only drawn when trawl position information is available.

Bottom bar

The number of tabs available on the bottom bar depends on how many channels your EK80 has. Two tab "groups" allow you to select channels and views. This example shows the EK80 with two channels. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.



A **Presentation modes**

Three presentation modes are available when you wish to see all the echogram channels simultaneously in the EK80 presentation. The three tabs will arrange the echogram views vertically, horizontally, or in rectangular rows and columns.

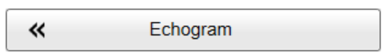
By default, the views are arranged automatically in the EK80 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

B **Selecting individual echogram channels**

Each channel is shown with a dedicated tab. The channel is identified with the name of the transducer in use. This name is the custom name you provided when you installed the transducer. Select a specific transducer tab to see only that channel in the EK80 presentation.

Selecting which echogram type to use

Once one or more echogram views are open, you can choose which echogram type to see.



Click once in the view that you wish to change. The view is activated. It is identified with a thick border. Open the **Active** menu, click **Echogram** to open the dialog box, and select **Echogram Type** on the **Echogram** page.

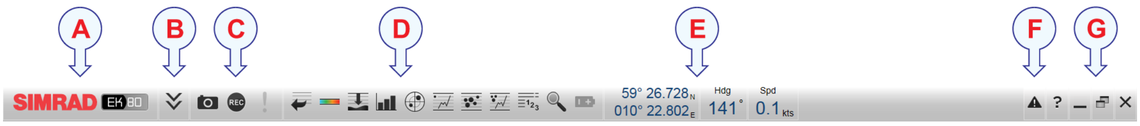
In each echogram view, you can also select from a number of markers, lines and annotations to enhance the echogram, or to provide additional information. These can be selected on the **Lines** page in the **Echogram** dialog box.

Related topics

User interface introduction, page 60

Top bar description

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.



A **Logo and product name**

This information identifies the brand and the product.

B **Menu button**

Select this button to hide or show the menu.

C **Screen Capture / Event / Record**

Select **Screen Capture** to make a screen dump of the current EK80 presentation. Select **Event** to initiate an event annotation on the echogram. The **Record** indicator shows you when recording is active.

D **Information panes**

Each information pane is opened and closed with its dedicated button on the top bar.

E **Navigational information**

These fields are separate read-outs that presenting useful information related to the vessel and/or EK80 navigation and operation. The information shown on the EK80 top bar must not be used for vessel navigation.

F **Messages button**

By flashing, **Messages** shows you that the EK80 has issued a message. The colour of the triangle reflects the severity of the most serious message. Select to open the **Messages** dialog box.

G **Operating system buttons**

Select to open the context-sensitive help, to minimize and maximize the presentation window, and to close the EK80 program.

Related topics

User interface introduction, page 60

Information panes

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Select the relevant button on the top bar to open the information pane. In most cases, the data in the information pane is only valid for the selected channel. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

The EK80 offers the following information panes (from left).

- **History**

  The *History* information pane allows you to view previously recorded echogram sequences. Do not confuse this function with the recording functionality. The *History* function saves the echogram images automatically on the Processor Unit hard disk The information in the *History* presentation is the same as on the original echogram presentation.

- **Colour Scale**

  The *Colour Scale* information pane allows you to view the current colour scale in use, and to make changes to the echo levels it presents.

- **Depth**

  The *Depth* information pane provides the water depth in the current echogram view. If you have several echogram views open, you can place one pane in each view.

- **Bottom Hardness**

  The *Bottom Hardness* information pane shows you the current bottom reflectivity. This indicates what type of bottom you have under your keel. The value is calculated using the bottom echo strength in the current ping.

- **TS (Target Strength) Histogram**

  The *TS Histogram* information pane shows a histogram of the echoes detected from single fishes. The histogram presents the actual size of the fish in weight or length, or with echo strength (shown in dB). The *TS Histogram* information pane only works when you have a split-beam transducer.

- **Target Position**

  The *Target Position* information pane shows the position of the detected single target echoes. The current ping (largest circles) and the three previous ping (smaller circles) are shown. The view is "from above". The colours indicate the echo strength. The *Target Position* information pane only works when you use of a split-beam transducer.

- **TS(f)**

  The *TS(f)* information pane offers an analysis of the target strength for single targets versus frequency. The algorithms use settings from the **Single Target Detection** dialog box. The information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.

- **Biomass**

  The *Biomass* information pane displays an index of the biomass in the current view. The biomass index is the $\mathbf{s_A}$ value, or *Nautical area scattering coefficient* (NASC), measured with unit m^2/nmi^2.

- **Sv(f)**

  The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them. The information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.

- **Numerical**

  The *Numerical* information pane offers a numerical and graphical presentation of all the various parameters applicable for the current mode and operation. Information about transducer, environment and current layers are included. The currently active layer is identified with red text.

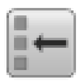
- **Zoom**

  The *Zoom* information pane allows you to magnify a chosen area of the current echogram.

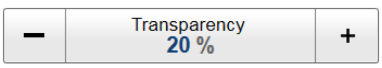
- **Transceiver Power Supply**

  The transceiver may be powered by an external power source. If the transceiver runs of a battery, you must monitor the supply voltage. The *Transceiver Power Supply* information pane shows you the current supply voltage provided to the transceiver.

Tip



You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size.
The **Transparency** *function allows you to adjust how much you are able to see "through" the information panes you have opened. The* **Transparency** *function is located on the* **Display** *menu.*

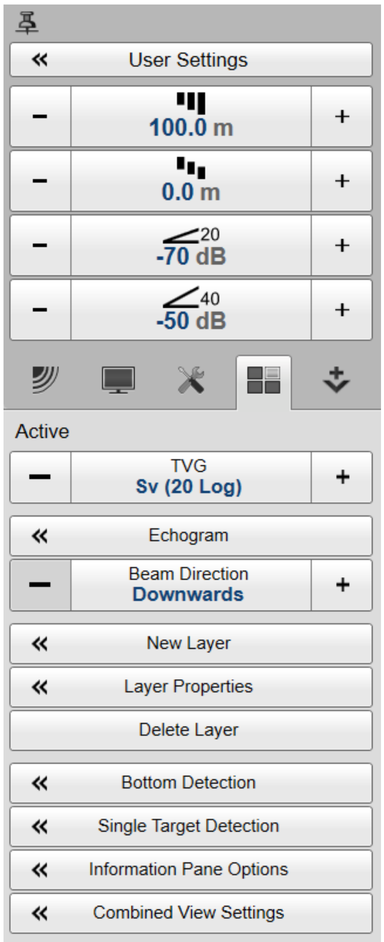


Related topics

User interface introduction, page 60

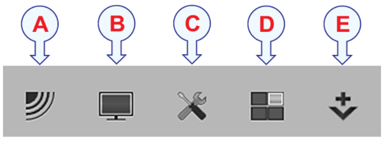
Menu system

The menu system is by default located on the right side of the EK80 presentation. The menus are organized in a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.



The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.

Below the **Main** menu, a set of dedicated icons are used to open the secondary menus.



A **Operation menu**: The **Operation** menu offers the most common functions for basic EK80 operation.

B **Display menu**: The **Display** menu provides basic functions related to the screen behaviour and presentation of EK80 data.

C **Setup menu**: The **Setup** menu provides basic functions related to the EK80 installation parameters and its communication with peripheral systems.

D **Active menu**: The **Active** menu offers parameters related to current views and data presentations shown by the EK80.

E **Extras menu**: The **Extras** menu is - in spite of its name and location - not a menu at all. This "menu" opens a small view to monitor key operational parameters.

Tip

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the EK80 presentation. This gives you more space for echo information. To hide the menu, select **Menu** *on the top bar. To retrieve the menu, select* **Menu** *one more time. When the menu is hidden, it is temporarily shown on the left or right side of the EK80 presentation if you move the cursor to that position.*

Related topics

User interface introduction, page 60

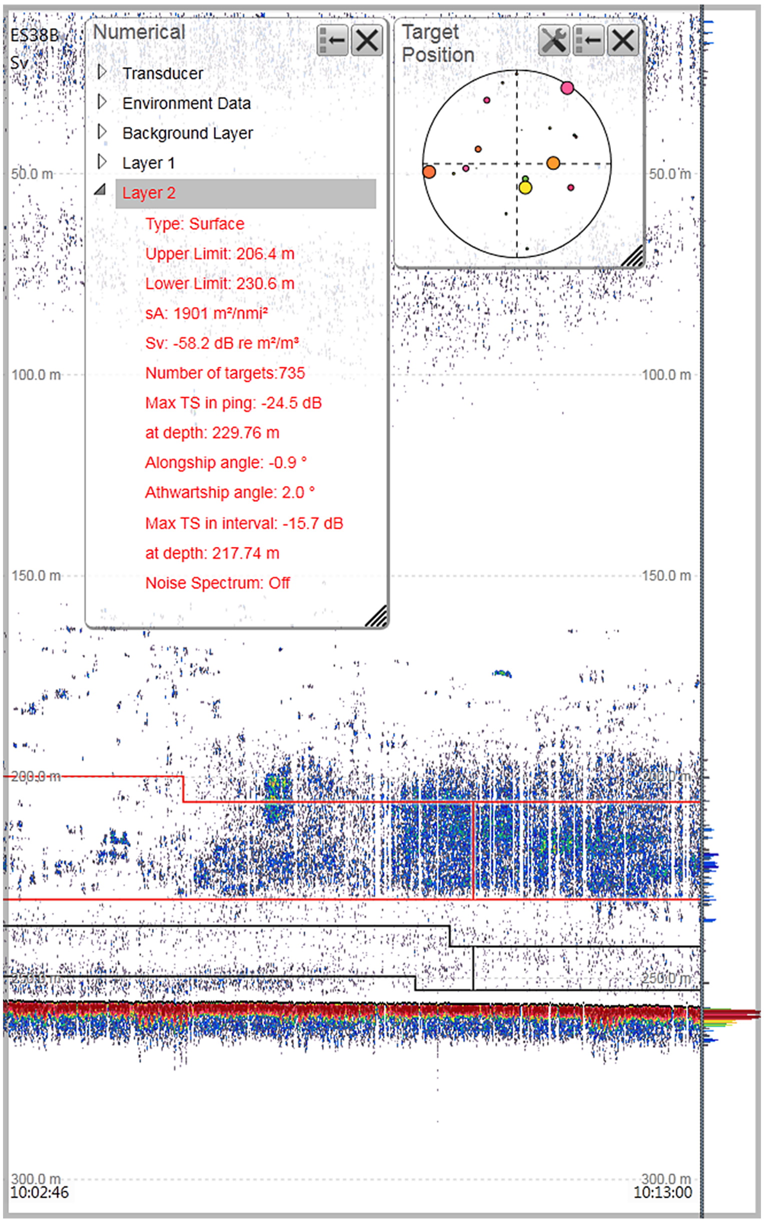
Working with depth layers

Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis.

Description

Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.



Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

Note

The layers are a key function of the EK80. During normal operation, make sure that you are aware of the layer(s) that you have established, and that the requested layer is activated to feed information to the information panes.

You can create as many depth layers as you want on the EK80. By default, any layer you create will be applied to all echogram views simultaneously. The layers may overlap if necessary, and you can control how much they overlap each other.

When you are working with layers, the following functionality is available.

- To create a new layer, use the **New Layer** dialog box. The **New Layer** dialog box is located on the **Active** menu.
- In the echogram, you can click between the layer lines in the echogram view to select ("activate") it. The active layer is shown with red border lines.

Note

The information shown in your information panes only reflect the echo data from the currently "active" layer.

If you wish your information panes to show data from the entire water column, you must either click "outside" the layer(s) in your echogram to deselect all of them. This will "activate" the default background layer. Another option is to simply delete all the layers.

- Once a depth layer has been made you can change its properties using the **Layer Properties** dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view. The lines in the echogram will reflect the changes you make, but these will disappear to the left after some time. Observe that vertical lines are drawn in the echogram to identify the start of each calculation interval. The **Layer Properties** dialog box is located on the **Active** menu.
- A single layer can be deleted if you do not need it any longer. To delete a layer, select it in the echogram or in the *Numerical* information pane (layer data shown with red text), and then click **Delete Layer**. The **Delete Layer** function is located on the **Active** menu.
- When you record raw data, the layers you have defined are <u>not</u> included. This means that you can also use the layer functionality during replay.
- Each of the depth layers can be used to measure the background (ambient) noise in the water column.
- The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Related topics

User interface introduction, page 60

Setting up the EK80 Wide band scientific echo sounder for the first time

Topics

Setting up summary

Before a new EK80 Wide band scientific echo sounder can be put to use, it must be set up for operation.

Prerequisites

- The EK80 Wide band scientific echo sounder system units have all bee installed according to the instructions in the EK80 *Installation manual*.
- All cables have been connected and verified.
- All system units have been inspected.
- The EK80 operational software is available.
- The EK80 software license is available.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Do the following preparations.

  a Turn on the Processor Unit.

  b Make sure that you have administrative rights.

c Switch off any firewall applications.

d Open the operating systems's *Network and Sharing Center*, and set the IP address for the network adapter used to communicate with the transceiver.

- **IP Address**: 157.237.15.12

  Any address can be used, but 157.237.15.12 is recommended for legacy reasons. This is particularly important if your system contains old GPT transceivers.

- **Subnet mask**: 255.255.255.0

  You can leave **Subnet mask** blank and select **OK**. When you see an error message saying that the message subnet mask is missing, select **OK** again. A default subnet mask is then automatically generated.

2 Install the EK80 operational software.

3 Turn on the transceiver(s).

4 Make sure that the Processor Unit is connected to the transceiver(s) using the Ethernet cable specified in the EK80 *Installation manual*.

If you use more than one transceiver, a high performance Ethernet switch must be used.

Note

It is very important that high-quality Ethernet cables are used. You must use CAT-5E STP (Shielded Twisted Pair) quality or better. If you use cables with lower bandwidth capacity you will reduce the EK80 performance.

5 Start the EK80.

6 On the **Software License** page, install the software license(s).

7 On the **Transducer** page, install each transducer.

8 On the **Transceiver Installation** page, connect the transducer(s) to the transceiver(s).

9 On the **Sensor Installation** page, set up the interfaces to the navigation sensors.

10 In the **Environment** dialog box, select correct water temperature and salinity.

11 Start normal operation.

a On the **File Setup** page, define the recording parameters.

b Set **Operation** to *Normal*.

c In the **Normal Operation** dialog box, set the operating parameters.

d Set **Ping Mode** to *Interval*.

e With the **Ping Interval** function, specify the ping rate that has been defined for the survey.

f Set **Ping** to *On*.

Further requirements

To obtain quantitative data, the EK80 must be calibrated.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Installing the EK80 operational software

If your EK80 Wide band scientific echo sounder is provided with a Processor Unit, the EK80 software has already been installed. If you intend to use your own computer, you must install the software yourself.

Prerequisites

In order to install the software, you need the relevant file set on a suitable media. If the software is provided on a CD or a DVD, and your computer is not fitted with a suitable drive, copy the files to a USB flash drive.

Note

Make sure that you have administrative rights on the Processor Unit. You need this to install the software. If you purchased your own computer, you must verify that it meets the technical requirements for use with the EK80. Do this before you install the software.

Context

One or more valid software licenses are required to operate the EK80. The software licenses are installed after the EK80 software installation. The **Software License** page is provided for this purpose.

Procedure

1. Turn on the Processor Unit.
2. Switch off any firewall applications.
3. Insert the EK80 software media.

   If the EK80 software is provided on a CD or DVD, and your Processor Unit is not fitted with a suitable drive, copy the files to a USB flash drive.
4. Use a file manager application on the Processor Unit to access the software files.
5. Double-click `Setup.exe` to start the installation.

   Note

   If the operating system on your computer is not supported, the installation will stop with an error message. You must then upgrade your computer - or use a different one - to complete the software installation.

---

6 Allow the installation wizard to run. Follow the instructions provided.

We recommend that you install the software in the default folder suggested by the wizard. In the last dialog box you are permitted to remove old settings. Since this is your first installation of the software, you can disregard this option.

7 Once the software installation has been completed, double-click the icon on the desktop to start the program.

8 Depending on your operating system parameters, certain dialog boxes may open.

   a The Windows® Firewall may open a dialog box requesting information about the network. Select **Public**, and then select **Allow access**.

   b The operating system may also open other dialog boxes to verify that the EK80 software can run on the computer. You must permit this.

Further requirements

Observe the dedicated procedures for obtaining and installing the software licence(s).

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Turning on the EK80 to *Passive* mode

In order to use the EK80, you must first turn it on. In this situation we do not want the EK80 to transmit, so we will leave it in *Passive* mode.

Prerequisites

This procedure assumes that the entire EK80 installation has been inspected. All power sources have been measured and verified. All system cables and connectors have been checked and tested. The EK80 has been installed on the Processor Unit.

Context

The program is not automatically started when the Processor Unit is turned on. Once the operating system has started, select the program icon on the desktop.

When the EK80 is powered up and set to *Normal* mode, it will use the transducer to transmit acoustic pulses into the water.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Make sure that each transceiver is turned on.

2 Turn on the display.

If required, refer to the instructions provided by the display manufacturer.

3 Turn on the Processor Unit.

Wait while the operating system loads.

4 On the Processor Unit desktop, double-click the EK80 icon to start the program.

5 Select user settings.

During the program load, a dialog box appears to let you choose from the current user settings available on the EK80. The dialog box is only visible a few seconds. You do not need to make a choice here. You can select your predefined user setting at any time by means of the **User Settings** dialog box on the **Main** menu.

6 Once the EK80 program has started, observe that the presentation fills the entire screen.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71
Getting started, page 93
Starting normal operation, page 93

Obtaining and installing the software license

To operate the EK80 with a transceiver you need a valid software license. Before you can use the EK80 you must obtain a "license string" and install it on your Processor Unit. Without a license you will not be able to communicate with the transceiver.

Prerequisites

This procedure assumes that the EK80 operating software has been successfully installed on the Processor Unit.

Context

The software license is a 32 character hexadecimal string based on the transceiver's serial number. It defines several key parameters that control the functionality and behaviour of the transceiver(s) you use. Each software license code "unlocks" one transceiver for operational use with a set of predefined properties.

The software license is not linked to the physical Processor Unit. You can therefore easily move the software from one computer to another, just remember to make a copy of the license string.

Note

Once you receive your software license string(s), do not lose them. We suggest that you copy the information into a text file (for example Notepad), and add relevant information. Place the text file on the Processor Unit desktop, and make sure that backup copies are made.

In order to obtain a software license you must contact a Simrad dealer or distributor. You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

Note

This information is only valid if your EK80 is meant to operate with a Wide Band Transceiver (WBT), a WBT Mini or a WBT Tube.

Procedure

1. Obtain the necessary information about your transceiver(s) and transducer(s). Write down:
   a. The serial number for each transceiver.
   b. The beam type.
   c. Which transducers you have connected to each transceiver.
2. Send the necessary information to one of Simrad's dealers or distributors.

   You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

   You can use the following e-mail address:

   - purchase.order@simrad.com

Once the software license string(s) have been returned to you (most likely by e-mail), you can install the licenses into the software.

3. On the **Setup** menu, select **Installation**.

   Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.
4. On the left side of the **Installation** dialog box, select **Software License**.

   Observe that the **Software License** page opens.
5. Select **Type License String**, and type the license string into the dialog box.

   If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard. If you have received the license string on an electronic format (e-mail or text file), you can copy the string from the source document and paste it into the **Type License String** dialog box.

6 Select **OK** to save the license string and close the **Type License String** dialog box.

7 Verify that the license string is placed in the **Currently active licenses** list.

If necessary, select the license string on the left side, and click the arrow button [>] to move it to the **Currently active licenses** list.

8 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Defining the IP address on the Processor Unit network adapter for communication with the transceiver

The Processor Unit and the transceiver(s) communicate on a high capacity Ethernet cable. If more than one transceiver is used, an Ethernet switch is added. On the Processor Unit, define the IP address and Subnet mask for the Ethernet port used to communicate with the transceiver(s). EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

Prerequisites

This procedure is made for the Microsoft® Windows® 10 operating system. It is assumed that you are familiar with this operating system.

Context

As long as you do not change the Processor Unit to another computer, or replace the network adapter in your Processor Unit, you will only need to do this once.

Procedure

1 On the Processor Unit, close the EK80 program.

2 Open the **Network Connections** dialog box.

   a In the bottom-left corner of your desktop, select the Windows® search function.

   b In the search box, type "Network Connections", and open the **Network Connections** dialog box.

3 Right-click the network adapter you are going to use and select **Properties** on the shortcut menu.

4 On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.

5 Select **Use the following IP address**, and type the IP address and network mask.

   - **IP Address**: 157.237.15.12

     Any address can be used, but 157.237.15.12 is recommended for legacy reasons. This is particularly important if your system contains old GPT transceivers.

- **Subnet mask**: 255.255.255.0

  You can leave **Subnet mask** blank and select **OK**. When you see an error message saying that the message subnet mask is missing, select **OK** again. A default subnet mask is then automatically generated.

6 Select **OK** to save the selected settings, and then close all the dialog boxes.

7 Start the EK80 program.

8 Open the **Transceiver Installation** page.

   a Open the **Setup** menu.

   b On the **Setup** menu, select **Installation**.

   c On the left side of the **Installation** dialog box, select **Transceiver**.

9 Under **Transceiver Browsing** insert the IP Address that you just specified for the Ethernet adapter.

10 At the bottom of the page, select **Apply** to save your settings.

11 Turn each transceiver off and on.

   This forces the EK80 to assign new IP addresses within the selected IP range.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Installing one or more transducers

The transducers you wish to use with the EK80 must be "installed" as a part of the software configuration. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these. Unless you replace a broken transducer, or add a new, you only need to do this once.

Prerequisites

It is assumed that the EK80 software has been installed, and that all relevant license strings have been applied. You need to know the type and serial number of each transducer that you wish to install.

Context

Each transducer is added using the **Transducer Installation** page. The **Transducer Installation** page is located in the **Installation** dialog box.

You can only choose a transducer from the **Model** list. The list is generated from a system file on your Processor Unit. It contains all the transducers that are compatible with the transceiver(s) you have. The list also includes technical specifications for each transducer. You can not see this information, but it is used by the EK80 to set up the operational parameters. This allows each transceiver to optimise its performance for the individual transducer models.

If you cannot find your transducer in the list, contact you dealer, agent or Kongsberg Maritime to upgrade the relevant software component in the EK80.

Note

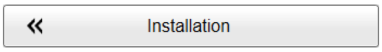
Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

If your EK80 shall only be used with an ADCP transceiver for current profiling, you do not need to install other transducers.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transducer Installation**.

4 Select the transducer you wish to install from the **Model** list.

Note

Make sure that you select a transducer that is supported by your current license.

---

5 Insert the serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 is calibrated. Some new Simrad transducers with built-in "intelligence" will automatically provide this serial number.

6 Type the name you wish to use into the **Custom Name** box.

Type any name that you wish to use to identify the transducer. The name you select will only be used to identify the transducer in other dialog boxes. It is not used in the echo data that you export. If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

7 Select mounting method.

8 Specify the orientation of the transducer beam.

9 If relevant for your transducer installation, provide the accurate physical location of the transducer with reference to the vessel's coordinate system.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

Use the centre of the transducer face as reference, and define the offset values related to the *Ship Origin*.

a Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the transducer is located ahead of the ship origin.

b Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the transducer is located on the starboard side of the ship origin.

c Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the transducer is located under the ship origin.

10 If relevant for your transducer installation, provide the rotation angles.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

a Obtain the rotation (angle) information from the personnel that installed the transducer.

b Insert the values.

- Specify an angle (in degrees) to compensate for any deviation from the X axis (fore-and-aft direction) in the coordinate system.
- Specify an angle (in degrees) to compensate for any deviation from the y-axis (athwartship direction) in the coordinate system.
- Specify an angle (in degrees) to compensate for any deviation from the Z axis (vertical direction) in the coordinate system.

Keep in mind that in its default position (all axis set to 0 (zero)) the transducer points straight down with the orientation mark (arrow) pointing forward. This default position must always be used as reference for rotation adjustments. To set the angles correctly, observe this exercise.

1 Start with the transducer in its default position: The transducer face is horizontal facing down, and the indicator arrow is pointing straight forward.

2 If the transducer is properly installed without unintentional skew, the **Rotation around X** can also be set to 0 (zero).

3 Lift the front end of the transducer up, so that the indicator arrow moves up. This is a **Rotation around Y**.

4 Proceed until the requested angle has been reached.

Example: If a 30-degree Y angle is requested, the **Rotation around Y** must be set to 60 degrees (that is the angle from the default position). Since the transducer is pointing straight forward, the **Rotation around Z** value is 0 (zero).

5 From this raised position, turn the transducer towards starboard. The indicator arrow is still pointing up. This is a **Rotation around Z**.

6 Proceed until the requested angle has been reached.

Example: If a 90-degree Z angle is requested, the **Rotation around Z** must be set to 90 degrees (that is the angle from the forward position).

11 Select **Add** to save the information you have provided.

The transducer is added to the list in the **Installed Transducers** box.

12 Repeat for each transducer that you wish to install.

13 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

Once a transducer has been installed, it is listed in the **Installed Transducers** box. To see the information you have collected about the transducer, select the relevant transducer in the list.

The **Edit** functionality on the **Transducer Installation** page makes it possible to change the information you have provided for the transducer. You cannot change the model identification and the serial number. The custom name is used several places in the user interface, and it can be changed.

The **Remove** functionality on the **Transducer Installation** page makes it possible to delete the information you have provided for the transducer. There is no "undo" functionality.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Installing transceiver channels

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*.

- All cables are connected and tested.
- Each transceiver is turned on.
- The software license for each transceiver is installed and activated.
- The Ethernet adapter in the Processor Unit is set up with a unique IP address.

- All relevant transducers are installed using the **Transducer Installation** page.

Context

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers.

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.
- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.
- **Available**: This channel is vacant and ready for use.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

2 On the left side of the **Installation** dialog box, select **Transceiver**.

3 Install the channels(s).

a Observe that the transceiver(s) you have connected to the Processor Unit are listed.

Each transceiver is identified with type and serial number. The available channels on each transceiver are listed separately.

b For each channel, choose which transducer to connect to.

The list of transducers available for installation is defined by those you installed on the **Transducer** page.

Note

This is a critical task. Make sure that the correct transducer is selected.

---

c Observe that the status for the relevant frequency channels change to *Installed*.

Tip

If no transceivers are listed:

1. *Select* **Browse** *in the* **Transceiver Browsing** *box, and open the* **Local IP Address** *box.*
2. *Select the correct address for the Ethernet adapter you are using.*

   Select **Apply**.

   This will make the EK80 search the network for available transceivers.
3. *Check that each transceiver has been turned on.*
4. *Verify that the Ethernet communication between the units is operational.*
5. *If you are using an Ethernet switch, make sure that it works.*
6. *If you have changed the network settings, turn each transceiver off and on.*

   EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

---

4 At the bottom of the page, select **Apply** to save your settings.

5 Repeat until all the channels have been installed.

6 Continue your work in the **Installation** dialog box, or select **OK** to close it.

When all channels have been installed, you can start normal operation.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Related topics

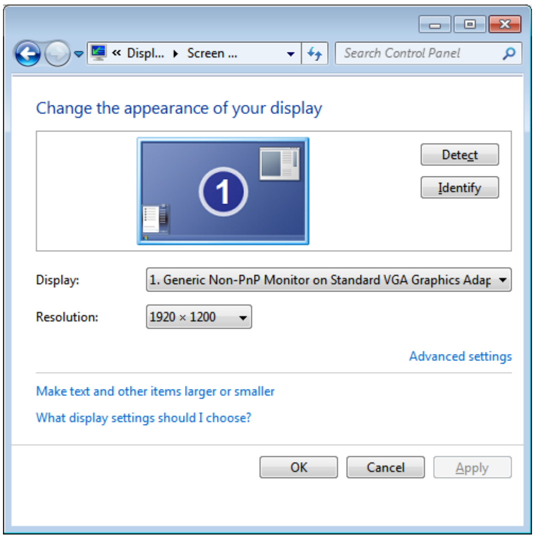
Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

Adjusting the screen resolution

Some computers have graphic adapters that are not able to detect the resolution of the current display. This limitation can also be caused by the display cable, or by imperfections in a display matrix system. In such cases, you must use the functionality of the operating system to adjust the screen resolution.

Prerequisites

This procedure is made for the Microsoft® Windows® 7 and 10 operating systems. It is assumed that you are familiar with these operating systems.



Context

As a general recommendation, you should set the screen resolution as high as possible. This will allow you more "space" in the EK80 presentation to offer more detailed information. The physical width of your top bar will also be extended, and free space for icons and navigational information.

Unless you change the hardware (computer, graphic adapter or display), you will only need to do this once.

Procedure

1 On the Processor Unit, close the EK80 program.

2 This procedure is made for the Microsoft® Windows® 7 operating system.

   a In the bottom-left corner of your desktop, select the Windows® **Start** button.

   b On the right-hand side of the **Start** menu, select **Control Panel**.

   c Observe that the Control Panel opens.

   d In the **Control Panel** dialog box, under **Appearance and Personalization**, select **Adjust screen resolution**.

   e Change the display settings.

      1 Make sure that the correct display is shown.

      2 Change the resolution to maximum permitted resolution for the display.

      3 Select **OK**.

      4 Observe that the screen resolution changes.

      5 If you are satisfied with the new resolution, select **Keep changes** in the acknowledge dialog box.

   f Click the [**X**] in the top right corner to close the Control Panel.

3 This procedure is made for the Microsoft® Windows® 10 operating system.

   a In the bottom-left corner of your desktop, select the Windows® **Start** button.

   b On the menu, select **Settings**.

   c Observe that the **Windows Settings** dialog box opens.

   d Select **System** in the top left corner of the **Windows Settings** dialog box.

   e On the left side of the dialog box, select **Display**.

   f Change the display settings.

      1 Make sure that the correct display is shown.

      2 Change the resolution to maximum permitted resolution for the display.

      3 Select **OK**.

      4 Observe that the screen resolution changes.

      5 If you are satisfied with the new resolution, select **Keep changes** in the acknowledge dialog box.

   g Select [**X**] in the top right corner to close the **Windows Settings** dialog box.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71

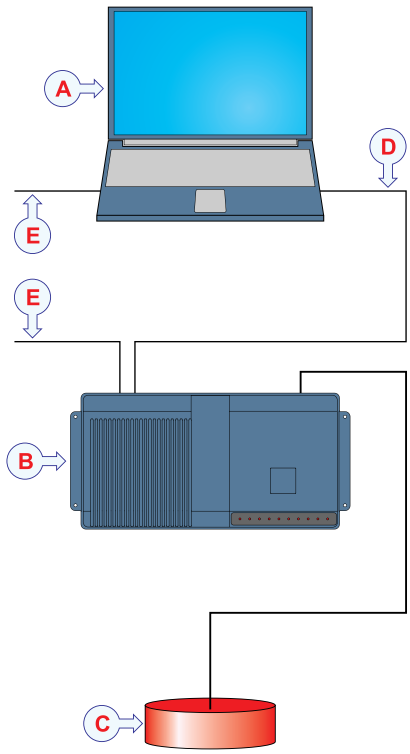
Assembling a portable EK80 system

Topics

System diagram, portable

The system diagram identifies the main components of a portable EK80 system. Only the main connections between the units are shown.

The portable EK80 Wide band scientific echo sounder system consists of one transducer, one Wide Band Transceiver (WBT) and one computer. The WBT Mini and WBT Tube transceivers can also be used. In this publication, the computer is referred to as the Processor Unit.



A *Processor Unit*

B *Wide Band Transceiver (WBT)*

C *Transducer*

D *Ethernet cable*

E *Battery cables*

Related topics

Assembling a portable EK80 system, page 86

Assembling a portable system

A portable EK80 system does not require an "installation". However, each main unit must be connected together, and a suitable power source must be available. The use of external sensors must be dictated by the operational requirements.

Prerequisites

Assembling a portable system does not require any special skills or tools. We will however suggest that initial unpacking and assembly take place in a workshop.

The computer is not a standard part of the EK80 delivery. A suitable computer must be purchased locally.

We suggest that you use a dedicated protective device to prevent the battery from discharging.

Procedure

1. Unpack each item from its transport box.

   Consider keeping the boxes for future use.

2. Consult the packing list(s) to verify that all the necessary parts are included in the shipment.

   If you believe that parts are missing, contact your dealer immediately to have the necessary actions taken.

3. Inspect each item closely for visible damage following storage and/or transport.

   If you find damage, such as dents, scratches or loose parts, contact your dealer immediately to have the necessary actions taken.

4. Place the computer and the Wide Band Transceiver (WBT) on a suitable workbench.
5. Place the transducer in a large bucket or tank of water.

   Note

   You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers may be damaged if they transmit in open air.

6. Connect the Ethernet cable from the computer to the Ethernet socket on the Wide Band Transceiver (WBT).

   Note

   It is very important that a high-quality Ethernet cable is used. You must use CAT-5E STP (Shielded Twisted Pair) quality or better. If you use cables with lower bandwidth capacity you will reduce the EK80 performance.

7. Connect the transducer cable to the Wide Band Transceiver (WBT).
8. Connect the computer to power.
9. Connect the Wide Band Transceiver (WBT) to mains power.

Further requirements

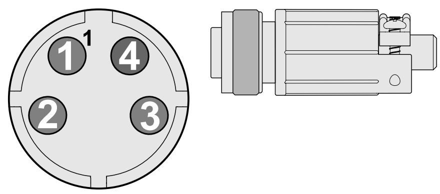
You can now turn on the computer, install the software and the license(s), and set up the EK80 system for normal operation.

Related topics

Assembling a portable EK80 system, page 86

Battery power cable

A suitable cable must be provided if you wish to power the Wide Band Transceiver (WBT) from a battery.



The power socket is mounted on the rear panel of the transceiver. The socket fits a Conxall 4-pin Mini-Con-X® shielded plug. One spare plug is included with the EK80 delivery. You can use this plug if you wish to operate the transceiver from a battery. The plug can be ordered from the manufacturer or purchased from Kongsberg Maritime. Use part number 390616.

- **Manufacturer**: Switchcraft Conxall
- **Manufacturer's website**: http://www.conxall.com
- **True manufacturer's part number**: SF6382–4SG–520

Pin configuration

Pin number	1	2	3	4
Voltage	+12 VDC	0 VDC	0 VDC	+12 VDC

Minimum cable requirements

- **Conductors**: 2 x 1.5 mm^2
- **Screen**: None
- **Voltage**: 60 V
- **Maximum outer diameter**: Not applicable

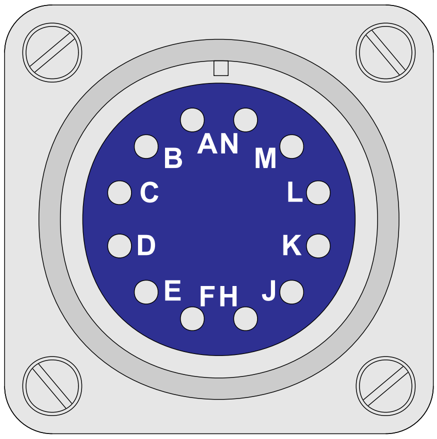
Related topics

Assembling a portable EK80 system, page 86

GPT Transducer plug connections

The transducer plug on the General Purpose Transceiver (GPT) and some versions of the Wide Band Transceiver (WBT) allows offers 12 pins named A through N.

The special plug used to connect the transducer(s) to the Wide Band Transceiver (WBT) is provided with the EK80 delivery.



- **A** Segment 4 (+)
- **B** Segment 4 (–)
- **C** Segment 3 (+)
- **D** Segment 3 (–)
- **E** Segment 2 (+)
- **F** Segment 2 (–)
- **G** Does not exist
- **H** Segment 1 (+)
- **I** Does not exist
- **J** Segment 1 (–)
- **K** Not used
- **L** Used for specific transducer functionality
- **M** Used for specific transducer functionality
- **N** Cable screen

If you need more information about the transducer connections, refer to the documentation provided with the transducer, or to the EK80 *Installation manual*.

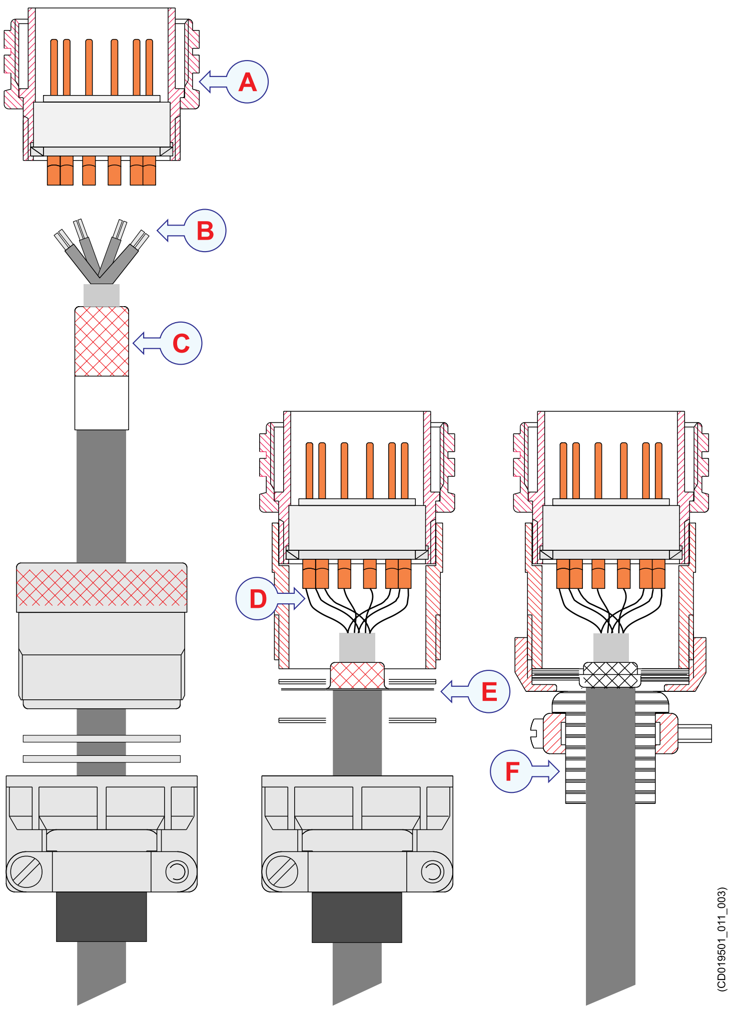
Related topics

Assembling a portable EK80 system, page 86

12-pin Amphenol plug

The transducer socket on the transceiver allows you to connect one or more single or split beam transducers using a 12-pin Amphenol plug (97-24-19P).

In order to connect the transducer cable to the plug, the plug must be disassembled as described below.



A Disassemble the plug.

B Remove a few millimeters of the insulation on the individual cables.

C Fold the outer and inner screen backwards, and fasten them temporary with tape.

D Thread each wire through a heat-shrinkable tubing, solder the wire end to the appropriate pin, and insulate with the heat-shrinkable tubing.

E Remove the tape from the outer and inner screen, and spread the screens out to place them between the large washers.

F Assemble the plug house, and tighten the rubber sleeve.

Related topics

Assembling a portable EK80 system, page 86

Operating procedures

Topics

Installing and maintaining software, page 329

Maintaining the EK80, page 341

Installing and troubleshooting Network Time Protocol (NTP), page 360

Getting started

Topics

Starting normal operation

The procedures are partly provided to get you acquainted with the basic functionality offered by the EK80, and partly to set up the EK80 for normal use. If you already know the current operational settings are acceptable, you may not need to do any of these procedures.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. The operational software is installed on the Processor Unit, and ready for use.

Context

Observe these brief procedures to familiarize yourself with the basic operation. When starting up, the EK80 will automatically apply its previous settings.

Procedure

1 Turn on the EK80.

Turning on the EK80 to *Passive* mode, page 94

2 Familiarize yourself with the user interface.

Getting to know the user interface, page 95

3 Make sure that the transceiver and transducer settings are correct.

Checking transceiver and transducer settings, page 97

4 Set **Operation** to *Normal* to start "pinging"..

Selecting *Normal* mode, page 99

5 Make sure that the bottom detection parameters have been set up so that the bottom is correctly detected.

Verifying that the bottom is correctly detected, page 101

6 Make sure that the transceiver parameters are set up correctly.

Checking and/or editing the transceiver parameters, page 102

7 Turn off the EK80.

Turning off the EK80, page 104

Related topics

Getting started, page 93

Turning on the EK80 to *Passive* mode

In order to use the EK80, you must first turn it on. In this situation we do not want the EK80 to transmit, so we will leave it in *Passive* mode.

Prerequisites

This procedure assumes that the entire EK80 installation has been inspected. All power sources have been measured and verified. All system cables and connectors have been checked and tested. The EK80 has been installed on the Processor Unit.

Context

The program is not automatically started when the Processor Unit is turned on. Once the operating system has started, select the program icon on the desktop.

When the EK80 is powered up and set to *Normal* mode, it will use the transducer to transmit acoustic pulses into the water.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Make sure that each transceiver is turned on.

2 Turn on the display.

If required, refer to the instructions provided by the display manufacturer.

3 Turn on the Processor Unit.

Wait while the operating system loads.

4 On the Processor Unit desktop, double-click the EK80 icon to start the program.

5 Select user settings.

During the program load, a dialog box appears to let you choose from the current user settings available on the EK80. The dialog box is only visible a few seconds. You do not need to make a choice here. You can select your predefined user setting at any time by means of the **User Settings** dialog box on the **Main** menu.

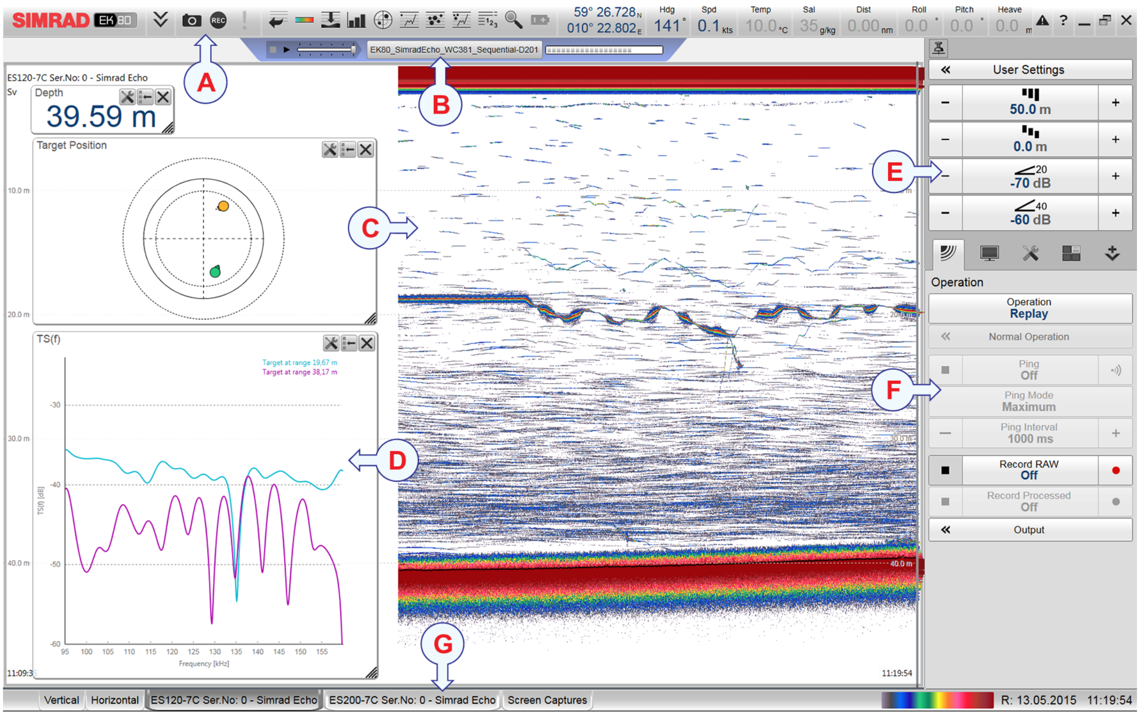
6 Once the EK80 program has started, observe that the presentation fills the entire screen.

Related topics

Setting up the EK80 Wide band scientific echo sounder for the first time, page 71
Getting started, page 93
Starting normal operation, page 93

Getting to know the user interface

The EK80 consists of specific visual elements that work together. The visual elements provide you with the echo information you need, they help you to control the functionality needed to understand this information, and finally, they allow you to control the operational parameters. By default, the EK80 presentation covers the entire screen.



A *Top bar*

B *Replay bar*

C *Echogram view*

D *Information panes*

E *Main menu*

F *Secondary menus*

G *Bottom bar*

Procedure

1 Move the cursor to the top bar, and investigate the functions provided.

Observe that small tooltips open to identify the various functions you can use.

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

2 Observe the information pane "buttons" on the top bar.

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. Before you open an information pane, you must first click in an echogram view to make it "active".

3 Move the cursor to the menu system on the right side of the EK80 presentation.

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Below the **Main** menu, a set of dedicated icons are used to open the secondary menus. Select the icon one more time to close the menu.

4 Move the cursor to the bottom of the EK80 presentation.

The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

5 Move the cursor to the bottom of the EK80 presentation.

The bottom bar is located at the bottom of the EK80 presentation and stretches from the far left to the far right. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

6 Move the cursor to the echogram views in the main EK80 presentation.

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

7 Click inside one of the echogram views.

Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Observe that the border lines of the active view are drawn with a thicker line.

Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to *all the views* simultaneously.

Related topics

Getting started, page 93
Starting normal operation, page 93

Checking transceiver and transducer settings

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. It is often useful to verify that all the channels are properly set up. This is a requirement for the EK80 performance.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. The EK80 system is turned on and operates normally. Minimum one Wide Band Transceiver (WBT) with one or more transducers has been connected.

Context

If you are using a EK80 that has been in use for some time, you can safely assume that the transceivers and transducers have been set up properly. However, the procedure may prove useful if you are an inexperienced user. Make sure that you do not change any important settings.

Note

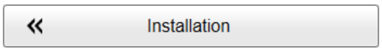
When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 Make sure that the currently connected transducer(s) are shown as "tabs" at the bottom of the EK80 presentation.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side, select **Transducer Installation**.

On the **Installed Transducers** list, select one of the transducers. Observe that the **Transducer** page opens with all settings unavailable. This is a safety precaution to prevent unintentional changes to the transducer settings. To make any changes, you must select **Edit**.

5 Make sure that each transducer has been installed with all settings defined.

The physical location of the EK80 transducer is important for the EK80 data accuracy. The offset value for "X" defines the vertical location (the depth) of the transducer face.

This is the installation depth of the transducer; the vertical location of the transducer face relative to the water surface. In order to measure correct water depth, the EK80 needs to know the vertical distance between the vessel's water line and the acoustic face of each transducer. The depth of each individual transducer must be defined manually. Enter the depth as a positive number. If the displacement of your vessel changes considerably, you may consider changing this parameter often. For accurate location of the transducer, you need the detailed vessel drawings.

6 On the left side of the **Installation** dialog box, select **Transceiver**.

Observe that the **Transceiver Installation** page opens.

7 Make sure that all applicable transceivers and transducers are connected and operational.

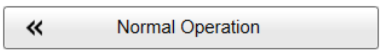
For each transceiver, this is indicated by the green label with text "Installed".

8 Close the **Installation** dialog box without making any changes.

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements.

9 Open the **Operation** menu.

10 On the **Operation** menu, open the **Normal Operation** dialog box.



11 For each channel (if necessary):

a Set **Pulse Type** to a *LFM* or *CW* mode as permitted by your license and the transducer.

b Set **Mode** to *Active*.

c Set **Pulse Duration** to your chosen value.

d Set **Power** to the correct power level for the transducer.

e Set **Start Frequency** and **End Frequency** to values permitted by your license and the transducer.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

12 Close the dialog box.

Related topics

Starting normal operation, page 35
Getting started, page 93
Starting normal operation, page 93
Maintaining the EK80, page 341
Transceiver pages, page 677
Transceiver Installation page, page 679
Transceiver IP Address page, page 686

Selecting *Normal* mode

In order to transmit ("ping") you must set the EK80 to *Normal* operating mode.

Context

The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*. *Normal* mode allows the EK80 to transmit ("ping") through the water, and to receive the echoes.

The transmission ("pinging") from the EK80 can be turned on or off. The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

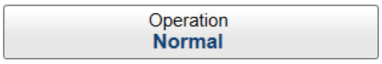
Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Normal*.



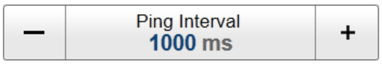
The EK80 is now ready for use.

3 Set **Ping** to *On*.

The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

4 Set **Ping Mode** to *Interval*.

5 Select either side of the button to choose a value.



Specify the ping rate that has been defined for the survey.

Result

The EK80 is now transmitting acoustic pulses ("pinging") into the water.

Further requirements

When the EK80 starts, it is very important that it detects the bottom correctly. In most cases this will take place automatically. However, we have experienced that large schools of fish or difficult bottom conditions have deceived the EK80 to display the wrong depth. In these cases the sounder may display the bottom at 0.0 metres at the top of the fish school. In order to aid the EK80 to locate the correct depth, you must adjust to bottom maximum and minimum ranges according to the actual bottom depth.

Related topics

Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105
Operation function, page 569

Verifying that the bottom is correctly detected

Locating the bottom is important for the EK80. The EK80 needs this *bottom lock* to locate the correct depth, and to stay on it during the operation, even if the depth changes continuously. Occasionally, difficult environmental, water or bottom conditions may inhibit a *bottom lock*.

Context

The **Bottom Detection** parameters provide separate limits for minimum and maximum depth. These limits may be used to obtain a *bottom lock* on the depth when the EK80 is transmitting. The **Bottom Backstep** parameter allows you to manually modify where on the bottom echo the depth will be detected.

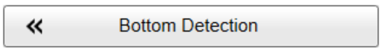
Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

Procedure

1 Open the **Active** menu.

2 Select **Bottom Detection**.



Tip

The bottom detection parameters are also found as a page in the **Information Pane Options** *dialog box. To open the* **Information Pane Options** *dialog box, select the button on the* **Active** *menu. To open the page, you can also select* **Setup** *in the Depth information pane.*

---

3 Set **Minimum Depth** and **Maximum Depth** to values fit for the depth at your current location.

- The **Minimum Depth** setting eliminates all unwanted bottom detections from the transducer face and down to the depth you have chosen.
- Set the **Maximum Depth** to approximately 50 % more than the expected depth.

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The EK80 will not detect the bottom at all, and the displayed depth will be 0.00 m.

Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

---

4 Select **OK** to save the selected settings and close the dialog box.

Result

If the EK80 should loose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined.

Related topics

Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105
Bottom Detection dialog box, page 621

Checking and/or editing the transceiver parameters

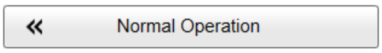
The **Normal Operation** dialog box lists all the transmission parameters. The dialog box provides one row for each channel in use. You can change the parameters.

Prerequisites

This procedure assumes that the EK80 system is turned on and operates normally. The **Normal Operation** dialog box is only available when the EK80 operates in *Normal* mode.

Procedure

1 On the **Operation** menu, open the **Normal Operation** dialog box.



2 For each channel:

   a Set **Pulse Type** to a *LFM* or *CW* mode as permitted by your license and the transducer.

   b Set **Mode** to *Active*.

   c Set **Pulse Duration** to your chosen value.

   d Set **Power** to the correct power level for the transducer.

   e Set **Start Frequency** and **End Frequency** to values permitted by your license and the transducer.

   In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

3 Close the dialog box.

Related topics

Getting started, page 93
Starting normal operation, page 93
Adjusting the transceiver parameters, page 257
Normal Operation dialog box, page 572
Extras menu, page 554
Processor page, page 713
Transceiver page, page 716

Opening the context-sensitive online help

Installed on your EK80 you will find a comprehensive context-sensitive online help system. Everything you can read in the EK80 Reference Manual can also be found in the online help. The online help can be opened from all dialog boxes in the EK80 user interface. You can also use the **Help** button on the top bar.

Context

To open the online help on its start page, select **Help** on the top bar. To read about a dialog box and the options provided, select the **[?]** button in its top right corner.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Note

The EK80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

Procedure

1. Select **Help** on the top bar.

   The online help opens on its start page. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

2. Select **Help** in the top right corner of each dialog box.

   The description of the relevant dialog box opens. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

Related topics

Basic operation, page 44
Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105

Turning off the EK80

You must never turn off the EK80 by means of the on/off switch on the Processor Unit. You must always close the EK80 program by selecting **Exit** on the top bar.

Context

When you do not use the EK80, turn off the display and the Processor Unit. If you are not using the EK80 for a long period of time, we recommend that you turn off the Wide Band Transceiver (WBT). Use the on/off switch on the power supply, or disengage the circuit breakers.

Procedure

1 Select **Exit** on the top bar.

Observe that the EK80 program closes down.

Tip

If the EK80 Processor Unit is used as a server with one or more clients connected, a relevant message will appear. We recommend that you turn these clients off first. Closing down the EK80 program with clients connected will take longer time.

2 If the Processor Unit does not turn itself off automatically, use the functionality provided by the operating system to turn it off manually.

3 Turn off the display.

If required, refer to the instructions provided by the display manufacturer.

4 Turn off each transceiver.

The Wide Band Transceiver (WBT) is not fitted with an on/off switch. You can leave the unit permanently turned on. If you are not using the EK80 for a long period of time, disconnect the power supply.

Related topics

Getting started, page 93
Starting normal operation, page 93

Choosing operating mode and key transmit parameters

Topics

Selecting *Normal* mode

In order to transmit ("ping") you must set the EK80 to *Normal* operating mode.

Context

The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*. *Normal* mode allows the EK80 to transmit ("ping") through the water, and to receive the echoes.

The transmission ("pinging") from the EK80 can be turned on or off. The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

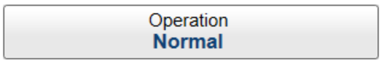
Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Normal*.



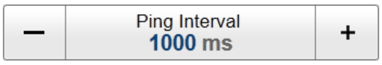
The EK80 is now ready for use.

3 Set **Ping** to *On*.

The **Ping** function enables or disables the EK80 transmissions into the water. Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*.

4 Set **Ping Mode** to *Interval*.

5 Select either side of the button to choose a value.



Specify the ping rate that has been defined for the survey.

Result

The EK80 is now transmitting acoustic pulses ("pinging") into the water.

Further requirements

When the EK80 starts, it is very important that it detects the bottom correctly. In most cases this will take place automatically. However, we have experienced that large schools of fish or difficult bottom conditions have deceived the EK80 to display the wrong depth. In these cases the sounder may display the bottom at 0.0 metres at the top of the fish school. In order to aid the EK80 to locate the correct depth, you must adjust to bottom maximum and minimum ranges according to the actual bottom depth.

Related topics

Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105
Operation function, page 569

Selecting *Inactive* mode

Inactive mode is provided to pause the EK80 operation temporarily. Neither transmission nor reception will take place. The current echoes will be removed from the presentation.

Context

The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*.

Note

Note that Inactive operating mode is not the same as Passive mode. While Inactive mode stops both transmission and reception, Passive mode will still allow the EK80 to receive echoes. To select Passive mode, use the **Normal Operation** *dialog box.*

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Inactive*.

When the EK80 has been disabled using this function, it will stop. The transmission ("pinging") stops.The current echoes will be removed from the presentation.

Related topics

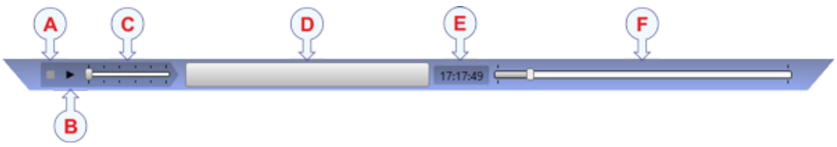
Choosing operating mode and key transmit parameters, page 105

Selecting *Replay* mode

Replay mode allows you to play back previously recorded raw data. The EK80 can not operate normally while in *Replay* mode. Neither transmission nor reception take place.

Context

All playback is controlled by the replay bar.



A ***Stop****: Select this button to stop the playback.*

B ***Play/Pause****: Select this button to start the playback, or to pause it.*

C ***Replay Speed****: Select this slider and move it sideways to adjust the replay speed.*

D ***Replay File****: The button shows you which file you are replaying. Select the button to open the* **Replay File** *dialog box.*

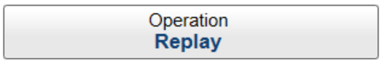
E ***Elapsed Time****: This is the elapsed time of the replay sequence.*

F ***Playback Progress****: This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.*

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Replay*.



The replay bar opens automatically. It is positioned directly below the top bar at the top of the EK80 presentation.

If you need to select which files to replay, select **Replay File** under the **Operation** button. You can also select the large button in the middle of the replay bar.

3 Select **Play/Pause** to start the playback.

4 To stop the replay choose any other operating mode.

Related topics

Choosing operating mode and key transmit parameters, page 105
Recording and replaying raw echo data, page 127
Operation function, page 569

Selecting *Mission* mode

In order to use a mission plan you must set the EK80 to *Mission* operating mode.

Prerequisites

A mission plan is complete, checked and saved.

Context

The **Operation** function controls the operating mode of the EK80. *Mission* mode allows the EK80 to transmit ("ping") through the water according to a mission plan.

The transmission ("pinging") from the EK80 can be turned on or off. The **Ping** function enables or disables the EK80 transmissions into the water. The pings included in the mission plan defines how often the EK80 will transmit.

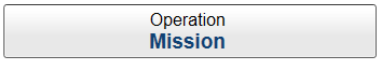
Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

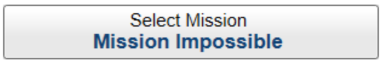
1 Open the **Operation** menu.

2 On the **Operation** menu, set **Operation** to *Mission*.



The EK80 is now ready for use.

3 Select **Select Mission** to choose the preferred mission.



The mission is now ready for use.

Result

The EK80 is now ready for activating the mission plan operation.

Further requirements

To activate the mission plan pinging (transmission) must be switched "on".

Related topics

Choosing operating mode and key transmit parameters, page 105

Verifying that the bottom is correctly detected

Locating the bottom is important for the EK80. The EK80 needs this *bottom lock* to locate the correct depth, and to stay on it during the operation, even if the depth changes continuously. Occasionally, difficult environmental, water or bottom conditions may inhibit a *bottom lock*.

Context

The **Bottom Detection** parameters provide separate limits for minimum and maximum depth. These limits may be used to obtain a *bottom lock* on the depth when the EK80 is transmitting. The **Bottom Backstep** parameter allows you to manually modify where on the bottom echo the depth will be detected.

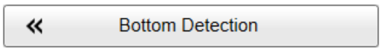
Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

Procedure

1 Open the **Active** menu.

2 Select **Bottom Detection**.



Tip

The bottom detection parameters are also found as a page in the **Information Pane Options** *dialog box. To open the* **Information Pane Options** *dialog box, select the button on the* **Active** *menu. To open the page, you can also select* **Setup** *in the Depth information pane.*

3 Set **Minimum Depth** and **Maximum Depth** to values fit for the depth at your current location.

- The **Minimum Depth** setting eliminates all unwanted bottom detections from the transducer face and down to the depth you have chosen.
- Set the **Maximum Depth** to approximately 50 % more than the expected depth.

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The EK80 will not detect the bottom at all, and the displayed depth will be 0.00 m.

Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

4 Select **OK** to save the selected settings and close the dialog box.

Result

If the EK80 should loose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined.

Related topics

Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105
Bottom Detection dialog box, page 621

Defining the ping (transmission) modes

You can easily control how often the EK80 shall transmit acoustic energy (a ping) into the water. You can disable the transmission altogether, set it to operate as fast as possible, or select a time interval.

Context

Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use it to control the *behaviour* of the transmissions (pinging).

- *Single Ping*: The EK80 transmits (pings) only when you select the symbol on the right side of the button.
- *Interval*: The EK80 transmits (pings) with a fixed time interval. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping).
- *Maximum*: The EK80 transmits (pings) as frequent as possible.

Note

For scientific operations, choose Interval, and select a **Ping Interval** *value according to the survey requirements.*

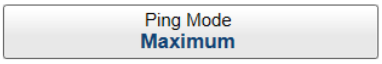
Procedure

1 Open the **Operation** menu.

2 On the **Operation** menu, set **Ping** to *On*.

- Select the symbol on the right side of the button to start pinging.
- Select the symbol on the left side the button to stop pinging.
- Select the middle of the button to open it.

3 Set **Ping Mode** to *Maximum*.

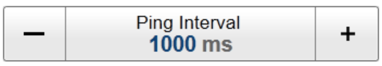


If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible. This gives you the maximum refresh rate. The time between each ping (the *ping rate*) depends mainly on the current range. In some systems, a low performance Processor Unit and/or a slow hard disk may reduce the ping rate. How fast your Processor Unit communicates with external peripherals may also have an effect on the ping rate.

or:

4 Set **Ping Mode** to *Interval*.

Select **Ping Interval** to specify the interval between each ping.

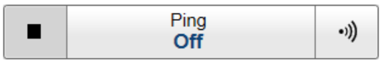


Select either side of the button to choose a value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

You can also change the value by selecting - and holding - the middle of the button, and move the cursor sideways. Drag the cursor sideways to increase or decrease the value. Release the mouse button when requested value is shown.

or:

5 Set **Ping Mode** to *Single Ping*.



Select the ping symbol on the right side of the button to transmit one single ping.

Related topics

Choosing operating mode and key transmit parameters, page 105
Setting up the echogram presentation, page 151
Ping Mode function, page 580

Transmitting single pings

You can set up the EK80 to transmit a single ping only when you select the **Ping** button.

Context

Use **Ping Mode** to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Maximum*. If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible.

If you choose *Single Ping*, you can transmit single pings by selecting the ping symbol on the right side of the button.

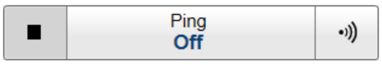
Note

For scientific operations, choose Interval, and select a **Ping Interval** *value according to the survey requirements.*

Procedure

1 Open the **Operation** menu.

2 Set **Ping Mode** to *Single Ping*.



3 Select the ping symbol on the right side of the button to transmit one single ping.

Related topics

Choosing operating mode and key transmit parameters, page 105

Transmitting with fixed-time intervals

You can set up the EK80 to transmit pings with a fixed time interval.

Context

Use **Ping Mode** to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Maximum*. If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible.

If you choose *Interval*, you must define the time between each ping with the **Ping Interval** function. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping).

Note

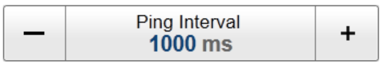
For scientific operations, choose Interval, and select a **Ping Interval** *value according to the survey requirements.*

Procedure

1 Open the **Operation** menu.

2 Set **Ping Mode** to *Interval*.

3 Select **Ping Interval** to specify the interval between each ping.



a Select either side of the button to choose a value.

b Select the middle of the button to open it.

If you have a keyboard connected to the EK80, type the requested value.

You can also change the value by selecting - and holding - the middle of the button, and move the cursor sideways. Drag the cursor sideways to increase or decrease the value. Release the mouse button when requested value is shown.

4 On the **Operation** menu, set **Ping** to *On*.

5 Select the symbol on the right side of the button to start pinging.

Related topics

Choosing operating mode and key transmit parameters, page 105

Switching between ADCP and echo sounder operation

The EC150-3C is a dual purpose unit. It can be used *either* as an acoustic Doppler current profiler (ADCP) instrument to measure water current *or* as a split-beam echo sounder. It can not operate these two functions simultaneously.

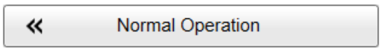
Context

This task is only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 Select operating mode.

- To activate ADCP operation, click the small option button on the left side of the **ADCP** table.
- To activate echo sounder operation, click the small option button on the left side of the **ES** table.

4 Select **OK** to save the selected setting and close the dialog box.

Result

The **Active** menu is changed accordingly.

Related topics

Choosing operating mode and key transmit parameters, page 105
Adjusting the transceiver parameters, page 257
Installing an ADCP transceiver in the user interface, page 308
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Opening the context-sensitive online help

Installed on your EK80 you will find a comprehensive context-sensitive online help system. Everything you can read in the EK80 Reference Manual can also be found in the online help. The online help can be opened from all dialog boxes in the EK80 user interface. You can also use the **Help** button on the top bar.

Context

To open the online help on its start page, select **Help** on the top bar. To read about a dialog box and the options provided, select the **[?]** button in its top right corner.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Note

The EK80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

Procedure

1 Select **Help** on the top bar.

The online help opens on its start page. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

2 Select **Help** in the top right corner of each dialog box.

The description of the relevant dialog box opens. Observe the menu on the left side of the help window. If you have a computer keyboard connected, you can use the search functionality.

Related topics

Basic operation, page 44
Getting started, page 93
Starting normal operation, page 93
Choosing operating mode and key transmit parameters, page 105

Controlling the gain and range settings

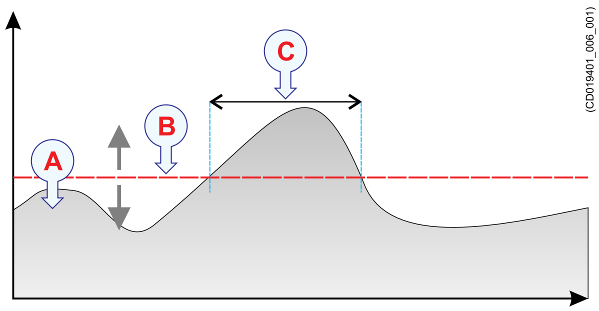
Topics

Adjusting the minimum level (echo sensitivity)

On the EK80 you do not change the actual gain in the receiver, but the minimum level of the colour scale. When the numerical dB level is *decreased*, the weaker echoes will start to appear in the echogram. This does not happen because the signal amplification is increased, but because the "visual sensitivity" has been improved.

Context

There are two minimum level buttons, one for each TVG setting (*20 log R* and *40 log R*). Each of these will only work on echograms with the same TVG setting.



The echo strength (A) changes with time. The Minimum Level (B) is adjusted up or down. Reducing the Minimum Level setting will increase the sensitivity. Only echoes over the Minimum Level will be shown (C).

The setting is by default only applied to currently selected echogram. It is identified with a thick border. Several echogram types are available. To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** dialog box.

Do not confuse this **Minimum Level** setting with the **TVG** (Time Varied Gain) setting.

Procedure

1 Observe the **Main** menu.

2 Locate the **Minimum Level** button.

3 Make the necessary adjustment.

The following methods can be used to adjust this setting:

- Select [+] or [-] to choose the level.
- Select the middle of the button and keep the mouse button pressed. Drag the cursor sideways to increase or decrease the level.
- Select the middle of the button to open the menu. Type the requested value. (You can only do this if you have computer keyboard connected to your Processor Unit.)

Related topics

Controlling the gain and range settings, page 116
Minimum Level function, page 567

Adjusting the TVG (Time Variable Gain) setting

When an acoustic pulse is sent through the water, it will gradually lose its energy. The greater the distance between the transducer and the target(s), the greater the loss of energy. **TVG** (Time Variable Gain) compensates for the loss of acoustic energy due to geometric spread and absorption. Use the **TVG** button or the **Echogram** dialog box.

Context

The TVG (Time Variable Gain) compensation is designed to counteract the natural phenomena of geometric spread and absorption loss. In the EK80, the TVG compensation is made using digital signal processing software.

Tip

You can select TVG using this function. You can also adjust the TVG setting in the **Echogram** *dialog box. The* **TVG** *function is located on the* **Echogram** *page.*

Procedure

1 Click in any echogram view to make it active.

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 Open the **Active** menu.

3 Locate the **TVG** button.

4 Select the **TVG** setting you want to use.
   - **No TVG**: TVG compensation is not implemented. This option is hardly ever used.
   - **Sv (20 Log)**: Volume backscattering strength
   - **Sp (40 Log)**: Point backscattering strength
5 Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

Related topics

Controlling the gain and range settings, page 116
TVG (Time Variable Gain) function, page 609

Choosing Range and Start Range values in a surface-related echogram

A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom. In a *Surface* echogram, the start depth of the echogram is defined by the positive **Start Range** depth value. The range from this start depth and down is defined by the **Range** value.

Context

The **Range** setting defines how "deep" you wish the EK80 to detect echoes. In other words, this is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies the "bottom" depth, while the **Start Range** setting specifies the "top" depth.

The range you specify applies to the currently selected echogram. It is identified with a thick border.Several echogram types are available.

In a *Surface* echogram, the **Start Range** value is used to determine from which depth the echogram will start. This is normally a few metres below the sea surface. The **Range** value is then used to define the vertical extension of the echogram. The **Range** may be set to *Auto*, but for scientific purposes a fixed range is recommended. The *Auto* setting allows the EK80 to automatically determine the depth range based on bottom detection.

Example

Start Range in a surface-related echogram

In a surface echogram, set the **Start Range** value to 0 metres. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 metres. The echogram will now show the area from the sea surface and down to 20 metres "below" the sea bottom. The sea bottom contour is easily detected when the depth changes.

Procedure

1 Click in any echogram view to make it active.

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

3 Locate the **Start Range** function.

4 Choose a positive value for **Start Range** to place the top of the echogram at the preferred depth below the sea bottom.

The following methods can be used to adjust this setting:

- Select [+] or [-] to choose the level.
- Select the middle of the button and keep the mouse button pressed. Drag the cursor sideways to increase or decrease the level.
- Select the middle of the button to open the menu. Type the requested value. (You can only do this if you have computer keyboard connected to your Processor Unit.)

5 Locate the **Range** function.

6 Choose a positive value for **Range** to place the bottom of the echogram at the preferred depth over or under the sea bottom.

Related topics

Controlling the gain and range settings, page 116
Range function, page 564
Start Range function, page 565
Observation range versus operational frequency, page 766
About bottom echoes, page 768

Choosing Range and Start Range values in a bottom-related echogram

A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom. In a *Bottom* echogram, the start depth of the echogram is defined by the negative **Start Range** depth value. The range from this start depth is defined by the **Range** value.

Context

The **Range** setting defines how "deep" you wish the EK80 to detect echoes. In other words, this is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies the "bottom" depth, while the **Start Range** setting specifies the "top" depth.

The range you specify applies to the currently selected echogram. It is identified with a thick border.Several echogram types are available.

In a *Bottom* echogram, the **Range** value is "added" to the **Start Range** value to determine the vertical depth of the echogram. The **Start Range** value must be negative because the echogram must start from a preferred height over the bottom.

> *Example*
>
> **Start Range** and **Range** in bottom-related echogram
>
> In a bottom echogram, set the **Start Range** value to –5 metres. This will make the echogram start from 5 metres above the sea bottom. Set **Range** to the 5 metres plus 10 = 15 metres. The echogram will now show the area from 5 metres above the depth, and down to 10 meters "below" the sea bottom. The sea bottom contour will appear as a flat line.

Procedure

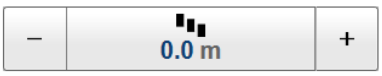
1. Click in any echogram view to make it active.

   The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2. Observe the **Main** menu.

   Its default location is on the right side of the EK80 presentation.

3. Locate the **Start Range** function.

4. Choose a negative value for **Start Range** to place the start depth at the preferred distance over the sea bottom.

   The following methods can be used to adjust this setting:

   - Select [+] or [-] to choose the level.
   - Select the middle of the button and keep the mouse button pressed. Drag the cursor sideways to increase or decrease the level.

- Select the middle of the button to open the menu. Type the requested value. (You can only do this if you have computer keyboard connected to your Processor Unit.)

5 Locate the **Range** function.

6 Choose a positive value for **Range** to place the bottom of the echogram at the preferred depth under the sea bottom.

Related topics

Controlling the gain and range settings, page 116
Range function, page 564
Start Range function, page 565
Observation range versus operational frequency, page 766
About bottom echoes, page 768

Defining the environmental settings

Topics

Configuring the environmental parameters

In order to make correct measurements of the targets in the water column, as well as the current depth, you must set up the correct environmental parameters.

Context

In order to obtain accurate depth readings and fish echoes, it is very important that the sound speed through the water is set correctly. Several parameters are required to calculate the correct sound speed value. If these parameters are not known to you, use the default value 1494 m/s. This is a typical mean value for sound speed in salt water. In fresh water we suggest that you set the sound speed value to 1450 m/s.

Procedure

1 Open the **Setup** menu.

2 Select **Environment**.

Observe that the **Environment** dialog box opens.

3 Open the **Water Column** page.

4 Specify if you work in fresh or salt water.

5 Specify the relevant environmental parameters.

6 Specify the sound speed.

If you select *Calculated*, the EK80 will calculate the sound speed based on the parameters you have provided. If you select *Manual*, you can provide your own value.

7 To study the resulting absorption curve, observe the information at the bottom of the page.

To increase the physical size of the curve, simply increase the size of the dialog box.

8 Select **OK** to save the selected settings and close the dialog box.

Related topics

Defining the environmental settings, page 122
Water Column page, page 653

Defining the sound speed close to the transducer

The sound speed close to the transducer face is an important parameter for maximum accuracy. You can define the sound speed at the transducer manually, or retrieve the information from a dedicated sensor.

Context

Many users mount a sensor close to the transducer face in order to measure the sound speed. The sensor is often referred to as a sound velocity probe. If the sensor is not mounted, the sound speed information must be provided manually.

The sensor is not a part of the EK80 system. This is a commercial item that can be purchased locally.

Procedure

1 Open the **Setup** menu.

2 Select **Environment**.

Observe that the **Environment** dialog box opens.

3 Open the **Transducer Face** page.

4 Select *Probe* if you have a suitable sensor connected to your EK80.

By selecting *Probe*, the sound speed values from the sensor are received. The information is included in the raw data files.

5 Select *Manual* if you do not have a suitable sensor.

Specify a manual sound speed value.

6 Select **OK** to save the selected settings and close the dialog box.

Related topics

Defining the environmental settings, page 122
Transducer Face page, page 656

Loading a sound speed profile

You can add a sound speed profile. The profile is used to calculate the mean speed of sound in the water column and to extract the speed of sound at the depth of the transducer.

Context

You can add a sound speed profile from a CTD (Conductivity, Temperature, Depth) sensor. Once a data set has been opened it is shown on the page.

Procedure

1 Open the **Setup** menu.

2 Select **Environment**.

3 Open the **Profile** page.

4 Select **Browse** to find and open the relevant source file from the sensor.

You can open any `.CTD` files, as well as other formats that are supported.

5 Select **Apply** to load the current data set.

Once a data set has been opened it is shown on the page.

6 On the **Transducer Face** and **Water Column** pages, select **Profile** to use this file as source for the sound speed information.

Related topics

Defining the environmental settings, page 122
Profile page, page 658

Setting up the input from a sound speed sensor

If you have a sound speed sensor located close to the transducer face, you can import the information from this sensor. This will result in more accurate EK80 data.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.
- The EK80 system is turned on and operates normally.

- The new sensor is physically connected to the EK80 using a serial or network cable. The sensor is turned on and in normal operation.

Neither tools nor instruments are required.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add***.*

Communication with the sound speed sensor is based on proprietary datagrams.

Procedure

1 Connect the sound speed sensor to an available serial communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Sensor Installation**.

5 For **Type**, select *Sound Speed* to import information from a sound speed sensor.

6 Select which port you want to import the sensor information on.

7 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page.*

---

8 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

   The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9 Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the sensor.

11 If relevant, specify a dedicated talker ID.

12 Select **Add** to save the new sensor interface you have defined.

   The sensor interface is added to the **Installed Sensors** list on the **Sensor Installation** page.

13 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Defining the environmental settings, page 122
Interfacing peripheral equipment, page 268
Profile page, page 658
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Recording and replaying raw echo data

Topics

Defining the raw data recording parameters

The EK80 allows you to record both raw and processed echo data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 On the **File Setup** page, define the recording parameters.

a Define the output directory for the recorded files.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.

b Define a file name prefix.

By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey.

c Define the maximum amount of bytes to be contained in one data file.

Select **Maximum** for 1 GB file size.

The current size of the RAW data file is displayed during data recording. If the current file size gets too big during recording, select **Split File** on the **Record RAW** button. **Record RAW** is located on the **Operation** menu.

d Specify the raw data recording parameters.

The **Range** setting defines the vertical or horizontal distance from where the echo presentation starts to the end of the search area.

- Select **Common** to use the same recording range for all your active channels.
- Select **Auto** to allow the EK80 to automatically find the required range value.
- Select **Individual** to use the different recording ranges for your active channels.

The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

- Select **Complex samples** to use the default data format.
- Select **Power/Angle** to reduce the file sizes.
- Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

The **Motion Data Recording** function allows you to control how often the motion data are saved in the raw data file.

5 At the bottom of the page, select **Apply** to save your settings.

6 Select **OK** to close the dialog box.

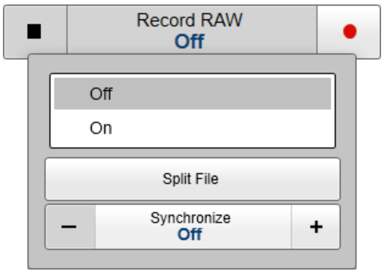
Related topics

Recording and replaying raw echo data, page 127
Record RAW function, page 582
File Setup page, page 632

Recording raw data

Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. You can save the data to the Processor Unit hard disk, or onto an external storage device. If your Processor Unit is connected to a local area network, you can also save to a network disk. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record RAW** function.

Prerequisites



Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page. The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Context

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.
- Use **Record RAW** on the **Operation** menu to record raw data. To play back data, use **Operation** to select *Replay* mode.This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer". These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. To open the *History* information pane, select the button on the top bar.

- Use **Record Processed** on the **Operation** menu to record processed data. This is only an export format. Processed data files can not be played back on the EK80.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Procedure

1 Open the **Operation** menu.

2 To start data recording, open the **Record RAW** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

The **Record** indicator on the top bar changes its colour to reflect that recording is active.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

3 If you wish to reduce the size of the data file you are recording, click the middle of the **Record RAW** button to open it, and select **Split File**.

The current file is closed, and a new file is automatically started.

4 To stop recording, open the **Record RAW** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

Recording and replaying raw echo data, page 127
Record RAW function, page 582

Selecting *Replay* mode

Replay mode allows you to play back previously recorded raw data. The EK80 can not operate normally while in *Replay* mode. Neither transmission nor reception take place.

Context

All playback is controlled by the replay bar.

A ***Stop****: Select this button to stop the playback.*

B ***Play/Pause****: Select this button to start the playback, or to pause it.*

C ***Replay Speed****: Select this slider and move it sideways to adjust the replay speed.*

D ***Replay File****: The button shows you which file you are replaying. Select the button to open the* ***Replay File*** *dialog box.*

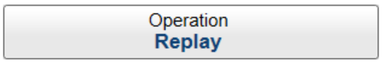
E ***Elapsed Time****: This is the elapsed time of the replay sequence.*

F ***Playback Progress****: This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.*

Procedure

1 Open the **Operation** menu.

2 Set **Operation** to *Replay*.



The replay bar opens automatically. It is positioned directly below the top bar at the top of the EK80 presentation.

If you need to select which files to replay, select **Replay File** under the **Operation** button. You can also select the large button in the middle of the replay bar.

3 Select **Play/Pause** to start the playback.

4 To stop the replay choose any other operating mode.

Related topics

Choosing operating mode and key transmit parameters, page 105
Recording and replaying raw echo data, page 127
Operation function, page 569

Choosing which raw data file(s) to replay

Every time you record echo data, the information is stored on the Processor Unit hard disk. Depending on your initial settings, the files may also be stored on a USB hard disk or even a network disk. The echo data files can be retrieved, and played back on the EK80.

Context

All playback is controlled by the replay bar.

A ***Stop***: *Select this button to stop the playback. The replay bar is not removed from the presentation until you select another operating mode.*

B ***Play/Pause***: *Select this button to start the playback, or to pause it.*

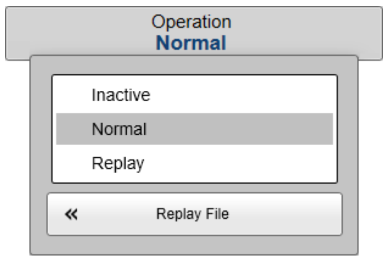
C ***Replay Speed***: *Select this slider and move it sideways to adjust the replay speed.*

D ***Replay File***: *The button shows you which file you are replaying. Select the button to open the* ***Replay File*** *dialog box.*

E ***Elapsed Time***: *This is the elapsed time of the replay sequence.*

F ***Playback Progress***: *This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.*

Procedure



1 Open the **Operation** menu.

2 Select **Operation** to see the available choices.

3 Select **Replay File** to open the dialog box.

The **Replay File** dialog box allows you to choose which file(s) to play back. The file names were generated automatically during recording, and each file is identified with the time and date it was made.

4 Select **Add** to choose a replay file.

A standard operating system dialog box is used to locate and select the files you wish to use.

5 If you wish to replay the selected files in an "endless" loop, select **Loop**.

6 If you wish to create index files for the selected files, select **Check for missing index files**.

During raw file recording, the EK80 automatically creates index files to allow for easier navigation in the replay files. On old files, however, these index files are not present. If you activate the **Check for missing index files** function, the index files are created on the selected files before playback starts.

Note

Creating index files can take a long time if you have many or/and large replay files, or if the files are stored on a network server.

---

7 Select **OK** to save the selected settings and close the dialog box.

8 Set **Operation** to *Replay*.

The replay bar opens automatically. It is positioned directly below the top bar at the top of the EK80 presentation.

Related topics

Recording and replaying raw echo data, page 127
Operation function, page 569
Replay File dialog box, page 747

Accessing the raw data files to delete, move or copy them

Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. You can save the data to the Processor Unit hard disk, or onto an external storage device. The data files can be copied or moved to an external storage device, or to another computer on the network. You can keep the recorded files for scientific studies, future references or for training purposes.

Prerequisites

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

You need a data storage device. This is typically a large capacity USB flash drive or a small portable hard disk. You can also connect the Processor Unit to a network, and copy the files to a server.

Procedure

1 Prepare a data storage device.

2 If you have a computer keyboard connected to your Processor Unit, press ⊞ **Win+E** to open the file manager.

3 Without a keyboard:

  a Observe the **Screen Captures** tab at the bottom of the EK80 presentation.

  b Select the **Screen Captures** tab to open the screen capture browser.

  c In the browser, select **Open Image Folder** to open the operating system folder.

4 In the file manager utility, locate the folder you defined on the **File Setup** page.

5 Use the functionality provided by the operating system to delete the files, or to copy or move them to the storage device.

6 Close the file manager utility.

7 To resume normal EK80 operation, select any other tab on the bottom bar.

Related topics

Recording and replaying raw echo data, page 127

Defining the depth range for raw data recording

Before you start recording, you must specify the range you wish to use. The EK80 will only record the echo data retrieved between the selected **Start Range** setting and the total range.

Context

You can set up a common recording range for all active channels, or individual ranges for each channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Tip

Set up the recording parameters ***before*** *you start the recording.*

Procedure

1. Open the **Operation** menu.
2. Select **Output**.

   Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.
3. In the **Output** dialog box, select **File Setup**.
4. On the **File Setup** page, define the recording parameters.
   a. Select **Common** to use the same recording range for all your active channels.

      Use **Range** to define the depth range to collect data from. Select **Auto** to allow the EK80 to automatically find the required range value.

      or:

   b. Select **Individual** to use the different recording ranges for your active channels.

      Limiting the recording range for high frequency channels is useful to reduce file size.
5. Select **OK** to save the selected settings and close the dialog box.

Related topics

Recording and replaying raw echo data, page 127
File Setup page, page 632

Reducing the raw data file sizes during CW recording

The data files will normally become very large. The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

Context

If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Tip

Set up the recording parameters before you start the recording.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 On the **File Setup** page, define the recording parameters.

a Select **Complex samples** to use the default data format.

This is the data format that was first introduced with the EK80. The format stores the maximum amount of information, but requires a larger data storage capacity.

or:

b Select **Power/Angle** to reduce the file sizes.

This will store the data using the Wide Band Transceiver (WBT) sample rate, but on the format used by the General Purpose Transceiver (GPT).

or:

c Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

---

5 At the bottom of the **Output** dialog box, select **OK** to save the chosen parameters and close it.

Related topics

Recording and replaying raw echo data, page 127
File Setup page, page 632

Disabling the automatic echogram history recording

The *History* function saves the echogram images automatically on the Processor Unit hard disk Every time the history file is saved to the hard disk, the pinging may be interrupted. It is therefore possible to disable the *History* function.

Context

The *History* information pane allows you to view previously recorded echogram sequences. These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation.

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 Under **History**, deselect **History Logging** to disable the function.

Note

If you open the History information pane while history logging is disabled, the information presented reflects the latest echoes recorded before the logging was disabled. When history logging is enabled after some time, you will have a "hole" in the ping sequence.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Recording and replaying raw echo data, page 127
File Setup page, page 632
History information pane description, page 462

Recording and exporting processed echo data

Topics

Defining the processed data recording parameters

The EK80 allows you to record processed data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined. You can also define the which file format to use.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 Select **File Setup** to open the page.

a Define the output directory for the recorded files.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.

b Select **Apply** to save your choice.

4 Select **Processed Data to File** to open the page.

a Select an output type from the list.

b Select the channel to be used as source for the information.

You can only choose from the channels that have already been installed. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

c Select **Add** to save the output format.

d Select **Apply** to save your choices.

5 At the bottom of the **Output** dialog box, select **OK** to save the chosen parameters and close it.

Related topics

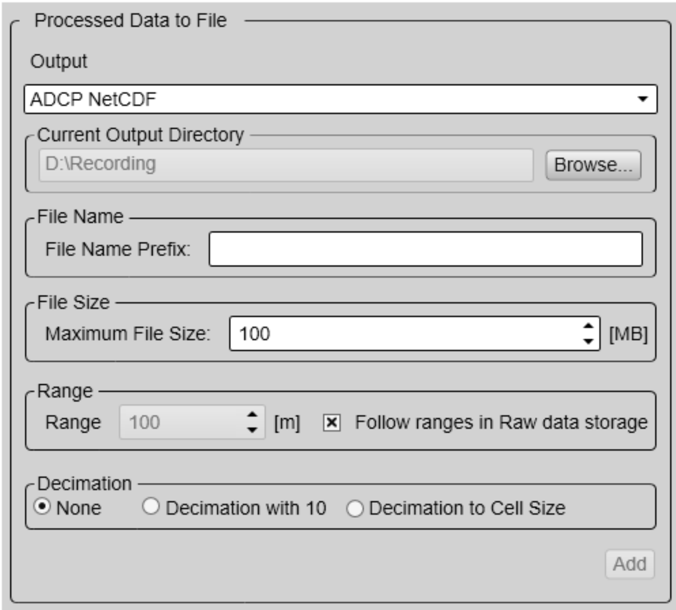
Recording and exporting processed echo data, page 137
File Setup page, page 632
Processed Data to File page, page 642

Defining recording formats for *ADCP netCDF* outputs

The EK80 allows you to record processed data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined. You can also define the which file format to use. One supported file format is the proprietary *ADCP netCDF* format.

Context

The ADCP netCDF file format is a proprietary file format designed by Kongsberg Maritime to hold ADCP velocity data. The format is created as an extension to the ICES SONAR-netCDF4 format using many of the same groups.



Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 Select **File Setup** to open the page.

a Define the output directory for the recorded files.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.

   b Select **Apply** to save your choice.

4 Select **Processed Data to File** to open the page.

   a Select the *ADCP netCDF* file format.

   b Define a file name prefix.

      By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey.

   c Define the maximum amount of bytes to be contained in one data file.

   d Specify the depth range.

      The **Range** setting defines the vertical range from the start depth and down. In other words, this is the vertical distance between the "top" and the "bottom" of the detection area. The EK80 will only export data retrieved between the sea surface and the selected depth. The depth range is selected in meters.

      If relevant, you can use the channel recording range you defined for raw data recording on the **File Setup** page.

   e Specify a decimation factor to reduce the sample density and the file size.

      - By selecting **Decimation with 10** groups of ten samples are averaged.
      - By selecting **Decimation to Depth Cell Size** all samples from the currently selected depth cell are averaged.

   f Select **Add** to save the output format.

   g Select **Apply** to save your choices.

5 At the bottom of the **Output** dialog box, select **OK** to save the chosen parameters and close it.

Related topics

Recording and exporting processed echo data, page 137
File Setup page, page 632
Processed Data to File page, page 642

Recording processed data

The processed data recording function provided by the EK80 allows you to save processed data on a selected format. The data files can be copied or moved to an external storage device, or to another computer on the network. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record Processed** function.

Prerequisites

Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page.

The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Before you start recording, you must also define which output format(s) you wish to use. To choose which processed data formats to record, select **Processed Data to File**.

Context

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.
- Use **Record RAW** on the **Operation** menu to record raw data. To play back data, use **Operation** to select *Replay* mode.This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer". These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. To open the *History* information pane, select the button on the top bar.
- Use **Record Processed** on the **Operation** menu to record processed data. This is only an export format. Processed data files can not be played back on the EK80.

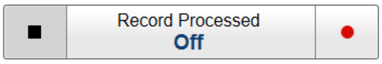
Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Procedure

1 Make sure that the **Record Processed** function is available.



If the **Record Processed** function is unavailable, it is most likely because you have forgotten to specify an output format. Use **Processed Data to File** to define which processed data formats to save, and where to place the files. This page is located in the **Output** dialog box.

2 To start data recording, open the **Record Processed** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

3 To stop recording, open the **Record Processed** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

Recording and exporting processed echo data, page 137
Record Processed function, page 584
File Setup page, page 632

Accessing the processed data files to delete, move or copy them

The processed data recording function provided by the EK80 allows you to save processed data on a selected format. You can save the data to the Processor Unit hard disk, or onto an external storage device. The data files can be copied or moved to an external storage device, or to another computer on the network.

Prerequisites

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

You need a data storage device. This is typically a large capacity USB flash drive or a small portable hard disk. You can also connect the Processor Unit to a network, and copy the files to a server.

Context

Processed data files can not be played back on the EK80.

Procedure

1 Prepare a data storage device.

2 If you have a computer keyboard connected to your Processor Unit, press ⊞ **Win+E** to open the file manager.

3 Without a keyboard:
   a Observe the **Screen Captures** tab at the bottom of the EK80 presentation.
   b Select the **Screen Captures** tab to open the screen capture browser.
   c In the browser, select **Open Image Folder** to open the operating system folder.
4 In the file manager utility, locate the folder you defined on the **File Setup** page.
5 Use the functionality provided by the operating system to delete the files, or to copy or move them to the storage device.
6 Close the file manager utility.
7 To resume normal EK80 operation, select any other tab on the bottom bar.

Related topics

Recording and exporting processed echo data, page 137

Setting up depth output to an external system

The EK80 can export depth information on a dedicated communication port (serial or Ethernet) The **Depth Output** page is used to set up the output parameters.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.

Context

The EK80 can export the depth information on several NMEA datagram formats. You can export several depth formats simultaneously, as each of them is handled independently.

Procedure

1 Connect the peripheral system to an available communication port on your Processor Unit.

   This is described in the EK80 *Installation manual*.
2 Open the **Operation** menu.

3 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Outputs** dialog box, select **I/O Setup**.

Observe that the **I/O Setup** page opens.

5 Observe that the available serial and network interface ports on the Processor Unit are listed.

6 Set up the relevant serial or Ethernet (LAN) communication parameters.

a On the **I/O Setup** page, select the port you wish to set up.

b Select **Setup** below the list to open the **Serial Port Setup** or **LAN Port Setup** dialog box.

c Set up the relevant communication parameters.

7 On the left side of the **Output** dialog box, select **Depth Output**.

Observe that the **Depth Output** page opens.

8 Select **Processed Data to Output** to open the page.

a Select which depth datagram to export.

b Select the communication port you want to use.

c Choose which channel to use as source for the depth information.

"Best practice" is to use the lowest frequency. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

d Select **Add** to start export of the chosen data format.

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page.

9 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

10 If you want to check the data flow on the selected port, select **Monitor**.

Make sure that there is data traffic on the output port (shown in the **Tx Data** box).

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

11 Select **Apply** and then **Close** to save all the parameters and close the **Output** dialog box.

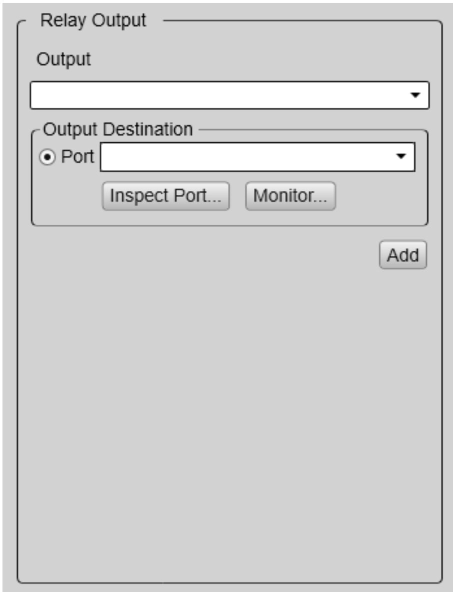
Related topics

Recording and exporting processed echo data, page 137
Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Processed Data to Output page, page 640

Exporting sensor data to a peripheral system

The information provided to the EK80 from various sensors can also be useful for other systems on board. The EK80 allows you to export the same sensor data that was originally imported. This can "reuse" the same information on other systems. The **Relay Output** page is used to set up and control this export functionality.

Context



The information imported to the EK80 from various sensors can also be useful for other systems on board your vessel. The EK80 allows you to "re-export" this sensor information. When activated, the selected sensor information is sent out on the chosen communication port (serial or LAN) on the Processor Unit.

The following sensor data can be exported:

- Navigation
- Motion sensor

Procedure

1 Connect the peripheral system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Operation** menu.

3 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the dialog box, select **I/O Setup**.

5 Observe that the available serial and network interface ports on the Processor Unit are listed.

6 Set up the relevant serial or Ethernet (LAN) communication parameters.

   a On the **I/O Setup** page, select the port you wish to set up.

   b Select **Setup** below the list to open the **Serial Port Setup** or **LAN Port Setup** dialog box.

   c Set up the relevant communication parameters.

   d Select **Apply** to save your choices.

7 On the left side of the **Output** dialog box, select **Relay Output**.

8 On the **Relay Output** page, set up the data export parameters.

   a Select which information to export.

   b Select the communication port you want to use.

   c Select **Add** to start export of the chosen data format.

9 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

10 If you want to check the data flow on the selected port, select **Monitor**.

In order to see this data traffic, your EK80 must be active and transmitting information to the peripheral system.

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

11 Select **Apply** and then **Close** to save all the parameters and close the **Output** dialog box.

Related topics

Recording and exporting processed echo data, page 137
Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Relay Output page, page 645

Saving and recalling screen captures

Topics

Saving a screen capture

While using the EK80 you may wish to make a screen capture to save an instantaneous copy of the current presentation. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk.

Context

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.
- Use **Record RAW** on the **Operation** menu to record raw data. To play back data, use **Operation** to select *Replay* mode.This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer". These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. To open the *History* information pane, select the button on the top bar.
- Use **Record Processed** on the **Operation** menu to record processed data. This is only an export format. Processed data files can not be played back on the EK80.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Procedure

1. Before you make the screen capture, you may wish to place an event marker on the echogram.

   The event marker may be useful later to identify the information.
2. Observe **Screen Capture** on the top bar.

3. Select **Screen Capture** to make a screen dump of the current EK80 presentation.

   Every time you do this a new image file is created. Each capture includes the entire presentation. This includes all the current views as well as the menu system.

Result

Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk.

Related topics

Saving and recalling screen captures, page 148
Recalling single echogram screen capture images, page 149
Accessing the screen capture images to delete, move or copy them, page 150
Screen Capture button, page 451

Recalling single echogram screen capture images

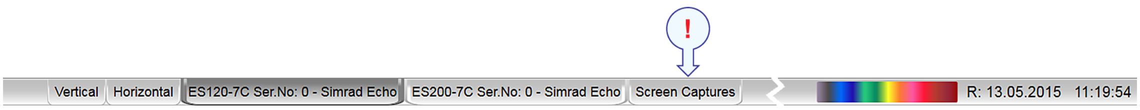
Screen Capture on the top bar allows you to make a copy of the current EK80 presentation. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a viewer that allows you to open these images.

Context

The screen capture browser simply presents a miniature version of each screen capture that you have made. Each file is provided in standard JPG format, which can be opened by most commercial bitmap editors. The file names are created automatically using the date and time when you used the **Screen Capture** button.

Procedure

1. Observe the **Screen Captures** tab at the bottom of the EK80 presentation.

2. Select the **Screen Captures** tab to open the screen capture browser.
3. Double-click the image you wish to enlarge.

4 Select **Return to Browser** to close the image.

5 To resume normal EK80 operation, select any other tab on the bottom bar.

Related topics

Saving and recalling screen captures, page 148
Saving a screen capture, page 148
Bottom bar description, page 530
Screen capture browser description, page 535

Accessing the screen capture images to delete, move or copy them

Once the screen capture images have been saved, you may also wish to delete them, copy them, or move them from the Processor Unit to a separate storage device.

Prerequisites

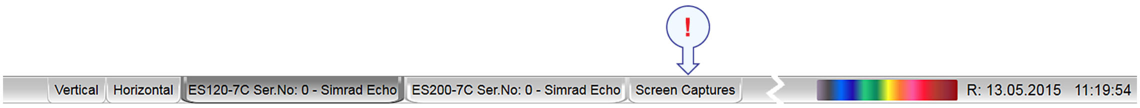
It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

You need a data storage device. This is typically a large capacity USB flash drive or a small portable hard disk. You can also connect the Processor Unit to a network, and copy the files to a server.

Procedure

1 Prepare a data storage device.

2 Observe the **Screen Captures** tab at the bottom of the EK80 presentation.



3 Select the **Screen Captures** tab to open the screen capture browser.

4 In the browser, select **Open Image Folder** to open the operating system folder.

5 Use the functionality provided by the operating system to delete the files, or to copy or move them to the storage device.

6 Close the file manager utility.

7 To resume normal EK80 operation, select any other tab on the bottom bar.

Related topics

Saving and recalling screen captures, page 148
Saving a screen capture, page 148
Bottom bar description, page 530
Screen capture browser description, page 535

Setting up the echogram presentation

Topics

Selecting which echogram type to use

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** dialog box.

Prerequisites

This functionality is not relevant when ADCP is activated.

Context

Use this function to select what kind of echogram you wish to see in the current (active) view.

- *Surface*: A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.

- *Bottom*: A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.
- *Pelagic*: A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.
- *Trawl*: The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

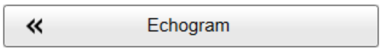
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Echogram** to open the page.

5 Under **Echogram Type** select the type you wish to apply to the chosen view.

6 Apply the change(s) you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Further requirements

If necessary, adjust the **Range** and **Start Range** settings accordingly.

Related topics

Basic operation, page 44
Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Echogram page, page 735

Selecting echogram views on the bottom bar

The bottom bar in the EK80 presentation allows you to select which presentations you wish to see, and how these are organized. The number of tabs available on the bottom bar depends on how many channels your EK80 has.

Context

The bottom bar is available all the time. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

The number of tabs available on the bottom bar depends on how many channels your EK80 has. Two tab "groups" allow you to select channels and views. This example shows the EK80 with two channels. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

The tabs on the bottom bar allows you to control the echogram presentation.

- **Selecting presentation modes**

  Three presentation modes are available when you wish to see all the echogram channels simultaneously in the EK80 presentation. The three tabs will arrange the echogram views vertically, horizontally, or in rectangular rows and columns.

  The **Vertical** and **Horizontal** tabs are only shown if you have two or more channels in use on your EK80. The **Square** tab is only shown if you have three or more channels.

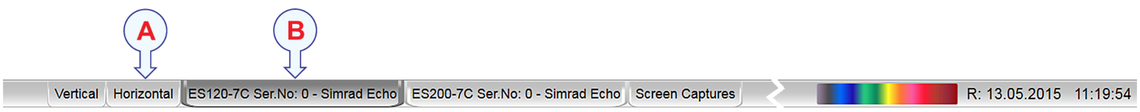
  By default, the views are arranged automatically in the EK80 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

- **Selecting individual echogram channels**

  Each channel is shown with a dedicated tab. The channel is identified with the name of the transducer in use. This name is the custom name you provided when you installed the transducer. Select a specific transducer tab to see only that channel in the EK80 presentation. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Procedure

- Observe the bottom bar at the bottom of the EK80 presentation.



- Select the appropriate tab to set up the presentation of the echogram views.

  A *Select **Square**, **Vertical** or **Horizontal** to arrange the echogram views accordingly.*

  B *Click the name of a transducer to see the relevant echogram. The echograms from the other channels are hidden.*

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519

Changing the size of the echogram views

You can modify the size of each individual echogram view in the EK80 presentation.

Context

The physical size of each echogram or other view can be changed individually. The content in a view that changes size will automatically be adjusted to take full advantage of the space available. The modifications you make are erased when you select one of the tabs on the bottom bar.

Tip

When two or more echograms are shown, you can use the **Layout** *dialog box to decide in which order - from top to bottom or left to right - you wish to see the echogram channels.*

The bottom bar in the EK80 presentation allows you to select which presentations you wish to see, and how these are organized. The number of tabs available on the bottom bar depends on how many channels your EK80 has. In this context, the phrase channel is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Procedure

1 Move the cursor to the border line between two views.

Observe that the cursor changes its shape; it now appears as two parallel lines with arrows pointing sideways or up/down.

2 Change the size of the view.

a Click on the left mouse button, and keep it depressed.

b Move the mouse - or roll the control wheel - and observe that the border line moves.

c Release the mouse button when the border line has been moved to desired position.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519

Defining the ping (transmission) modes

You can easily control how often the EK80 shall transmit acoustic energy (a ping) into the water. You can disable the transmission altogether, set it to operate as fast as possible, or select a time interval.

Context

Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use it to control the *behaviour* of the transmissions (pinging).

- *Single Ping*: The EK80 transmits (pings) only when you select the symbol on the right side of the button.
- *Interval*: The EK80 transmits (pings) with a fixed time interval. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping).
- *Maximum*: The EK80 transmits (pings) as frequent as possible.

Note

For scientific operations, choose Interval, and select a **Ping Interval** *value according to the survey requirements.*

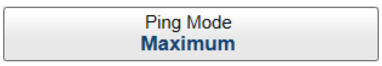
Procedure

1 Open the **Operation** menu.

2 On the **Operation** menu, set **Ping** to *On*.

- Select the symbol on the right side of the button to start pinging.
- Select the symbol on the left side the button to stop pinging.
- Select the middle of the button to open it.

3 Set **Ping Mode** to *Maximum*.

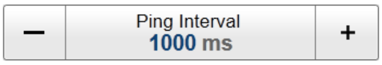


If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible. This gives you the maximum refresh rate. The time between each ping (the *ping rate*) depends mainly on the current range. In some systems, a low performance Processor Unit and/or a slow hard disk may reduce the ping rate. How fast your Processor Unit communicates with external peripherals may also have an effect on the ping rate.

or:

4 Set **Ping Mode** to *Interval*.

Select **Ping Interval** to specify the interval between each ping.

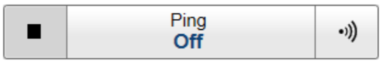


Select either side of the button to choose a value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

You can also change the value by selecting - and holding - the middle of the button, and move the cursor sideways. Drag the cursor sideways to increase or decrease the value. Release the mouse button when requested value is shown.

or:

5 Set **Ping Mode** to *Single Ping*.



Select the ping symbol on the right side of the button to transmit one single ping.

Related topics

Choosing operating mode and key transmit parameters, page 105
Setting up the echogram presentation, page 151
Ping Mode function, page 580

Choosing the colours used to present the echograms

Several different colour scales are predefined and available for the presentation of echograms. You can easily choose which colours to use. The presentation colours have no effect on the operational performance of the EK80. The **Colour Setup** dialog box controls the presentation colours used by the EK80. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation

Context

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

Tip

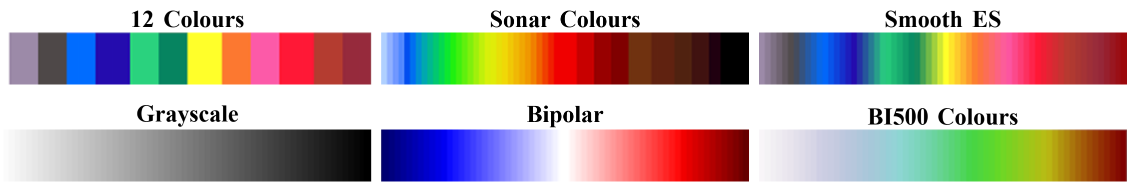
By default you have 64 or 12 colours available to present the echoes, and a selection of palettes. The colour scale can be retrieved any time by selecting **Colour Scale** *on the top bar. The chosen colours are shown at the bottom of the EK80 presentation.*

If you choose to use many colours, the resolution of the EK80 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Tip

You can adjust the echo level range by means of the **Colour Scale** *settings. These are opened from the Colour Scale information pane. You can find the same settings in the* **Information Pane Options** *dialog box on the* **Active** *menu.*

The following colour scales are available:

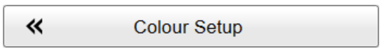


The **Smooth Echosounder** scale is based on the standard 12-colour scale. Additional colours have been added between them to make smoother colour transitions. The **Bipolar** scale is mainly intended for ADCP views.

Procedure

1 Open the **Display** menu.

2 Select **Colour Setup**.



3 Select the number of colours you want to use.

Note

If you want to apply one of the predefined colour scales, you must select 64 colours.

---

4 Select the colour scale you want to use.

5 At the bottom of the dialog box, select **Apply** to preview your choice(s).

6 Select **OK** to save the selected setting and close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Colour Setup dialog box, page 589

Adjusting the TVG in the Echogram dialog box

The Time Varied Gain (TVG) can be defined in the **Echogram** dialog box, or by means of the **TVG** function on the **Active** menu.

Context

When an acoustic pulse is sent through the water, it will gradually lose its energy. The greater the distance between the transducer and the target(s), the greater the loss of energy.

- **Geometric spread**: Once transmitted, the acoustic energy will spread out to form a circular beam. The width of this beam increases with the physical distance to the target(s).
- **Absorption loss**: Depending on the salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the physical distance to the target(s) increases.

Both the geometric spread and the absorption will also have an effect on the returned echo signal. That is why we normally refer to these factors as the *two-way transmission loss*.

The TVG (Time Variable Gain) compensation is designed to counteract the natural phenomena of geometric spread and absorption loss. In the EK80, the TVG compensation is made using digital signal processing software.

The TVG compensation is expressed as a logarithmic curve. You can choose from a selection of curves. Each curve has a different slope creating a different gain compensation. Each curve is identified with the equation *X log TVG*. The coefficient "*X*" is an integer. Typical values for "*X*" are 10 to 40.

Several TVG compensation settings are available.

- **No TVG**: TVG compensation is not implemented. This option is hardly ever used.
- **Sv (20 Log)**: Volume backscattering strength
- **Sp (40 Log)**: Point backscattering strength

Note

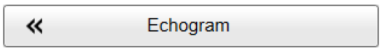
The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border. Normally, you must first click in the chosen echogram to activate it, and then choose the setting you wish to use.

Procedure

1. Click in the echogram view you wish to change.

   This will make the view active. The active echogram view is identified with a thicker border.
2. Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 In the **Echogram** dialog box, select the **Echogram** tab to open the page.

5 Choose the required setting.

6 Apply the change you have made.

   a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

   b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Select **OK** to save the selected settings and close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Echogram page, page 735

Selecting the horizontal scale in the echograms

The horizontal scale controls how "fast" the echograms move from right towards left across the EK80 presentation. You can change the horizontal scale on the **Horizontal Axis** page in the **Echogram** dialog box.

Context

The echogram travels from right towards left across the EK80 presentation. On the **Horizontal Axis** page you can choose the horizontal scale of the echogram. This controls the "speed" of the echogram.

- **Distance**: The horizontal scale is based on sailed distance. Select resolution and unit.
- **Time**: The horizontal scale is based on time. Select resolution and unit.
- **Ping**: The horizontal scale is based on the number of transmissions (“pings”) made. Select **View Size** to specify that the number of horizontal pixels shall define the number of displayed horizontal pings using one ping per pixel.
- **Speed**: The horizontal scale is based on the relative speed you choose. Select speed with the ruler.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

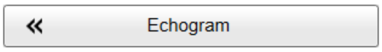
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Horizontal Axis** to open the page.

5 Select the horizontal scale you want to use.

6 Apply the change you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Select **OK** to close the dialog box.

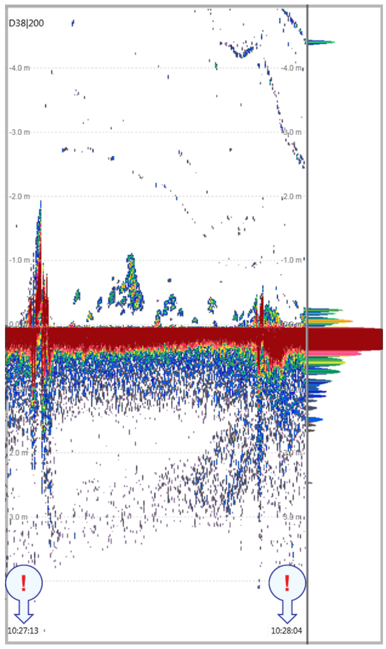
Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Horizontal Axis page, page 738

Adding scale labels to the echograms

In order to identify the horizontal scale of your echogram views, you can enable scale labels.

Context



Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

The following label options are available.

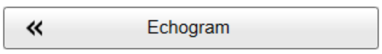
- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1. Click once in the view that you wish to change.

   The view is activated. It is identified with a thick border.
2. Open the **Active** menu.
3. Select **Echogram**.

   Observe that the **Echogram** dialog box opens.
4. On the left side of the **Echogram** dialog box, select **Horizontal Axis** to open the page.
5. Choose the label you wish to use.
6. Apply the change you have made.
   a. Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.
   b. Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.
7. Select **OK** to close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Horizontal Axis page, page 738

Adding horizontal depth lines to the echograms

When enabled, equidistant horizontal scale lines are drawn inside the view in the current foreground colour; black during day and white during night.

Context

A maximum of 10 scale lines can be selected. No scale lines are drawn when the scale line count is set to 0 (zero).

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

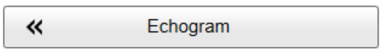
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Lines** to open the page.

5 Select **Scale** to enable the function, and choose how many scale lines you wish to see.

6 Apply the change(s) you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Lines page, page 732

Monitoring the biomass in the echogram

A biomass line can be added to your echogram to retrieve additional information. This function writes an extra thick and brightly coloured curve on the echogram.

Context

The biomass line shows you the integrated biomass for the pings within the selected calculation interval.This is a visual enhancement. It does not have any effect on the EK80 performance.

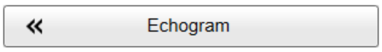
Tip

You can also measure the biomass in the Biomass information pane. The Biomass information pane displays an index of the biomass in the current view. The biomass index is the s_A *value, or Nautical area scattering coefficient (NASC), measured with unit* m^2/nmi^2.

Procedure

1. Click once in the relevant view.

   The view is activated. It is identified with a thick border.
2. Open the **Active** menu.
3. Select **Echogram**.

   Observe that the **Echogram** dialog box opens.
4. On the left side of the **Echogram** dialog box, select **Lines** to open the page.
5. Under **Lines** select **Biomass**.
6. Change the scale to fit the vertical space available on the echogram.
7. Apply the change(s) you have made.
   a. Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.
   b. Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.
8. Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Lines page, page 732
Biomass information pane description, page 474

Enhancing the bottom contour in the echograms

In order to make the bottom easier to identify, certain visual enhancements may be applied. These enhancements are made using the **Lines** page in the **Echogram** dialog box.

Context

The following enhancements can be used to increase the readability of the bottom contour.

- **Bottom Line**: This is an "on/off" switch. Select the box to enable the function. A bottom line can be added to your echogram to enhance the visual bottom detection. It appears as thin line that follows the bottom contour. The line is drawn in the current foreground colour.
- **White Line**: This is an "on" switch. A white line can be added to your echogram to enhance the visual bottom detection. It appears as thick line in the current background colour (normally white) that follows the bottom contour. This line will not remove information, it will simply "push" the echo information further down in order to make the bottom easier to see. You can use the white and the bottom lines simultaneously. Select **Normal** to disable the line.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

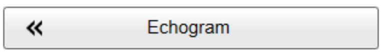
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Lines** to open the page.

5 Under **Bottom** select **White Line** and/or **Bottom Line** to suit your preferences.

6 Apply the change(s) you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Lines page, page 732

Adding vertical marker lines to the echogram

In order to create a horizontal scale, you can add short vertical marker lines to your echogram. These lines are used to measure time or distance.

Context

The following options are available:

- **None**: No vertical markers are shown.
- **Time**: A short vertical line is drawn in the upper part of the echogram once every minute.
- **Distance**: A short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

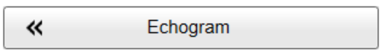
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Lines** to open the page.

5 Under **Ticks** select the vertical marker lines you want to use.

6 Apply the change(s) you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Lines page, page 732

Adding automatic trawl lines to the echogram presentation

Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram.

Prerequisites

In order to present the trawl lines automatically, a compatible trawl system must be connected to the EK80. A trawl with the relevant sensors mounted is deployed.

Context

A Simrad ITI (Integrated Trawl Instrumentation) system can be connected to the EK80. Communication with the ITI system is based on both NMEA and proprietary telegrams, and all necessary parameters are automatically defined. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram.

This is a visual enhancement. It does not have any effect on the EK80 performance.

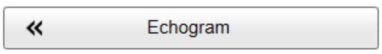
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

4 On the left side of the **Echogram** dialog box, select **Lines** to open the page.

5 Under **Lines** select **Trawl** to see the trawl lines in your echogram presentation.

6 Apply the change(s) you have made.

a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Lines page, page 732

Adding manual trawl lines to the echogram presentation

When you use a trawl, the EK80 can draw the upper and lower trawl lines in the echogram.

Context

A Simrad ITI (Integrated Trawl Instrumentation) system can be connected to the EK80. Communication with the ITI system is based on both NMEA and proprietary telegrams, and all necessary parameters are automatically defined. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram.

If another trawl or catch monitoring system is used, and this system does not provide the trawl opening and/or trawl distance automatically, the values must be entered manually.

Procedure

1. Open the **Setup** menu.
2. On the **Setup** menu, select **Installation**.

   Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.
3. On the left side of the **Installation** dialog box, select **Trawl** to open the page.
4. Use the spin box to provide the height of the trawl opening.

   If a computer keyboard is connected to your Processor Unit, you can click the spin box and type a new value.
5. Use the spin box to provide the distance from the vessel to the trawl.
6. Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Further requirements

In order to see the trawl lines in the echogram presentation, they must be enabled in the **Echogram** dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Trawl page, page 701

Adding comments and annotations to the echograms

When you study an echogram, it is often useful to add personal comments to it. Several different annotation types may be added to the echograms or other views. They are displayed on the views if this annotation feature is enabled.

Context

Use the **Annotations** page to type comments and insert annotations into views. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. The **Annotations** page is located in the **Installation** dialog box.

The **Lines** page in the **Echogram** dialog box allows you to enable or disable annotations in the echograms. Annotations can only be added to views while in *Normal* operational mode.

When you save raw data, the annotations you have defined are stored as annotation datagrams.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Annotations**.

4 Specify the annotations you wish to use, and how you wish to trigger them.

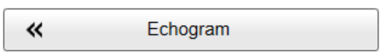
5 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

6 Click once in the relevant view.

The view is activated. It is identified with a thick border.

7 Open the **Active** menu.

8 Select **Echogram**.



Observe that the **Echogram** dialog box opens.

9 Select the **Lines** tab to open the page.

10 Under **Annotation** select the annotation types you want to use in your echogram.

11 Apply the change(s) you have made.

   a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

   b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

12 Close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Annotations page, page 702

Adding a single text comment to the echogram

Sometimes it can be useful to place a single written comment on the echogram. The **Manual Annotation** dialog box offers that function.

Context

Several different annotation types may be added to the echograms or other views. Annotations can only be added to views while in *Normal* operational mode.

Tip

Use the **Annotations** *page to type comments and insert annotations into views. The* **Annotations** *page is located in the* **Installation** *dialog box.*

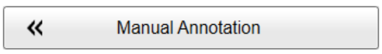
Procedure

1 Click once in the relevant view.

   The view is activated. It is identified with a thick border.

2 Open the **Setup** menu.

3 Select **Manual Annotation**.



4 Type any text into the box.

   The size of the box will adjust to the length of your text.

   If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

5 Select **OK** to place the annotation in the echoghram.

6 Select **Cancel** to close the dialog box.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Manual Annotation dialog box, page 596

Monitoring the survey operations from a client computer

By means of the EK80 Client application, you can monitor the survey operations made on the EK80.

Prerequisites

In order to monitor the survey operations, you need a computer. The computer must be connected to the same local area network as the EK80 Processor Unit. The computer must be operational with the EK80 Client program.

Context

The communication between the EK80 Client application and the EK80 can be made using the vessel's local area network.

In this context the EK80 Processor Unit is regarded as the "server". The computer that runs the EK80 client application is the "client".

To establish the communication, the Client computer must know the Ethernet address of the Server computer.

Procedure

1 On the **Setup** menu, select **Installation**.

2 On the left side of the **Installation** dialog box, select **Client Server Configuration**.

3 Select **Run as Server** to activate the EK80 Processor Unit as the "Server".

4 Select the **IP Address**.

This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one Ethernet adapter, you are provided with a list of the available addresses.

Choose which Ethernet adapter you will use on the Processor Unit to communicate with the Client computer. When the EK80 Client application starts, this Ethernet address will appear in the opening dialog box, and you can establish contact.

5 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

6 Start the EK80 Client program on your computer.

7 When the program starts, select the IP Address for the EK80 Processor Unit to establish contact.

Related topics

Setting up the echogram presentation, page 151
Echogram views, page 494
Lines and markers, page 519
Client Server Configuration page, page 708

Using the information panes to collect data from the echoes

Topics

Increasing the visibility of the information panes

When you open an information pane, you will see that it is transparent. This transparency allows you to see the echograms data behind the pane, but it may also reduce the visibility of the information in it.

Context

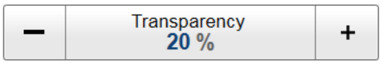
The information panes provided by the EK80 can be placed anywhere on top of the views in the presentation.

In order not to loose information, the panes have been designed so you can see through them. The degree of transparency can be controlled with this **Transparency** function. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.

Procedure

1 Open the **Display** menu.

2 Select a **Transparency** setting that fits your requirements.



To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.If you have a keyboard connected to the EK80, type the requested value.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Colour Scale information pane description, page 464
Depth information pane description, page 465
Bottom Hardness information pane description, page 467
TS (Target Strength) Histogram information pane description, page 469
Target Position information pane description, page 470
TS(f) information pane description, page 472
Biomass information pane description, page 474
Sv(f) information pane description, page 476
Numerical information pane description, page 478
Zoom information pane description, page 486
Transceiver Power Supply information pane description, page 488
Transparency function, page 588

Retrieving the latest echogram history

The *History* information pane allows you to view previously recorded echogram sequences.

Context

The *History* function saves the echogram images automatically on the Processor Unit hard disk These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation.

Note

The number of history files is limited. After reaching the maximum number of files, the latest echogram picture overwrites the oldest one. The history function still allows you to quickly look through echogram pictures from several hours.

Every time the history file is saved to the hard disk, the pinging may be interrupted. It is therefore possible to disable the *History* function. This function is located on the **File Setup** page in the **Output** dialog box.

Procedure

1 Click in any echogram view to make it active.

The data in the information pane is only valid for the selected channel. The active echogram view is identified with a thicker border.

2 On the top bar, select **History**.

In order to show you the recorded echograms, the echogram presentation is split in two. The right side will show you the active echogram, while the left side is used to display the recorded history. Move the slider button at the bottom of the presentation to view the full extent of the image.

3 Select **History** one more time to close the function.

Related topics

History information pane description, page 462

Disabling the automatic echogram history recording

The *History* function saves the echogram images automatically on the Processor Unit hard disk Every time the history file is saved to the hard disk, the pinging may be interrupted. It is therefore possible to disable the *History* function.

Context

The *History* information pane allows you to view previously recorded echogram sequences. These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation.

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 Under **History**, deselect **History Logging** to disable the function.

Note

If you open the History information pane while history logging is disabled, the information presented reflects the latest echoes recorded before the logging was disabled. When history logging is enabled after some time, you will have a "hole" in the ping sequence.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Recording and replaying raw echo data, page 127
File Setup page, page 632
History information pane description, page 462

Changing the colour scale in the EK80 presentations

The *Colour Scale* information pane shows you the current colour scale in use for the EK80 presentations. It also allows you to make changes to the echo levels it presents.

Context

The colour scales used by the EK80 are designed to reflect how strong the echoes are. The echo strength is measured in decibels (dB). In the basic colour scale with 12 colours, each colour represents a 3 dB step. This means that the entire scale covers 36 dB. The dynamic range of the EK80 is much larger. The **Colour Scale** parameters allow you to change the lower limit of colour scale range to match the current echoes.

Tip

The colour scale is shown on the bottom bar even when the Colour Scale information pane is closed.

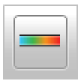
Your choice of colour scale has no effect on the gain settings. The colour scale only controls the visual presentation of the EK80 echo data.

Procedure

1 Click in any echogram view to make it active.

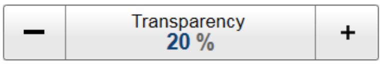
The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 On the top bar, select the appropriate button to open the information pane.



3 Click the bottom right corner of the information pane, and drag to requested size.

4 Select a **Transparency** setting that fits your requirements.



The chosen transparency percentage is used on all open information panes.

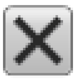
5 Investigate the information provided by the information pane.

The EK80 has a dynamic range of 140 dB. This means that the EK80 can receive both very strong and very weak echoes. Naturally, we can not present all these echoes on the display simultaneously, as this would create a mess of colours.

By default you have 64 or 12 colours available to present the echoes, and a selection of palettes. When 12 colours are used, we create a 36 dB total range, and let each colour present a 3 dB strength. Every colour (3 dB) the represent a doubling of the echo strength. With 12 colours in use this will be a 36 dB colour range from grey to brown. Grey is used for the weakest echoes, while the strongest echoes are brown. All echoes stronger than brown will still be brown, while echoes weaker than grey will not be shown. With 64 colours in use, each colour represents approximately 0.5 dB echo strength.

The **Colour Setup** dialog box allows you to choose from several colour scales to use in the EK80 echo presentations. Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience. If you choose to use many colours, the resolution of the EK80 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

6 Select **Close** in the top right corner to close the information pane.



Further requirements

Use the **Information Pane Options** dialog box to change the operating parameters for the data provided in the information panes. To open the **Information Pane Options** dialog box, select the button on the **Active** menu.

Related topics

Colour Scale information pane description, page 464

Opening the Depth information pane to read the current depth

You can easily read the current water depth in the *Depth* information pane.

Context

The *Depth* information pane provides the water depth in the current echogram view. If you have several echogram views open, you can place one pane in each view.

Procedure

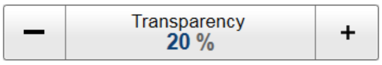
1 Click in the view you want to activate.

The active view is identified with a thicker border. The information provided will only be valid for the selected view.

2 On the top bar, select the appropriate button to open the information pane.

3 Click the bottom right corner of the information pane, and drag to requested size.

4 Select a **Transparency** setting that fits your requirements.



The chosen transparency percentage is used on all open information panes.

5 Investigate the information provided by the information pane.

The depth measure by the selected channel is shown. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. By default, the depth is shown in metres. You can change the unit of measurement on the **Units** page. The **Units** page is located in the **Installation** dialog box.

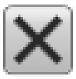
Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column. Use the dedicated **Bottom Detection** *function.*

6 Select **Setup** in the top right corner of the information pane to change the pane parameters.

Selecting **Setup** in the *Depth* information pane opens the **Bottom Detection** page in the **Information Pane Options** dialog box. The purpose of the **Bottom Detection** parameters are to define the upper and lower depth limits most likely to be used during the EK80 operation.

7 Select **Close** in the top right corner to close the information pane.



Related topics

Depth information pane description, page 465

Investigating the bottom characteristics

The *Bottom Hardness* information pane shows you the current bottom reflectivity. This gives an indication to how hard the bottom is. The value is calculated using the bottom echo strength in the current ping.

Context

The bottom hardness shown in the information pane was detected by the latest ping in the selected view.

Procedure

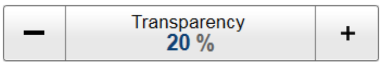
1 Click in any echogram view to make it active.

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 On the top bar, select the appropriate button to open the information pane.

3 Click the bottom right corner of the information pane, and drag to requested size.

4 Select a **Transparency** setting that fits your requirements.

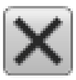


The chosen transparency percentage is used on all open information panes.

5 Investigate the information provided by the information pane.

The colours on the left side of the scale indicate a soft bottom, while the colours on the right hand side indicate a harder bottom. The vertical line in the hardness colour scale positions the latest ping. The current reflectivity is also shown measured in dB.

6 Select **Close** in the top right corner to close the information pane.



Related topics

Bottom Hardness information pane description, page 467

Changing the calculation parameters for the TS Histogram information pane

The **Calculation Interval** settings define the parameters that are used to calculate the information presented in the *TS Histogram* information pane.. You can base the calculations on sailed distance, elapsed time, or a portion of the echogram view.

Context

The biomass and size distribution values are calculated based on the echo data collected by the EK80. Use the **Calculation Interval** settings to limit the source data used by these calculations. You can base the calculations on data collected

- within a given time frame
- from a defined number of pings
- from the data used to create a portion of the current view

The **Calculation Interval** parameters can accessed from two places in the EK80 user interface.

- The page is opened in the **Information Pane Options** dialog box.
- The dialog box is opened using the **Calculation Interval** button on the **Setup** menu.

The parameters are the same, it does not matter if you use the page or the dialog box.

Procedure

1 Open the **Setup** menu.

2 Select **Calculation Interval** to open the dialog box.

3 Adjust the setting to fit your requirements.

- Select **Distance** to allow the EK80 to make the calculations based on the echo data collected during a sailed distance.
- Select **Time** to make the calculations based on the echo data collected during the last elapsed seconds or minutes.
- Select **Ping** to make the calculations based on the echo data collected during the latest number of Acoustic transmissions (pings).

4 If relevant, select **Apply to All Channels** and/or **Apply to All Layers**..

5 Select **OK** to save the selected setting and close the dialog box.

Related topics

TS (Target Strength) Histogram information pane description, page 469

Investigating the biomass

The *Biomass* information pane displays an index of the biomass in the current view. The biomass index is the $\mathbf{s_A}$ value, or *Nautical area scattering coefficient* (NASC), measured with unit m^2/nmi^2.

Context

The digit shown in the *Biomass* information pane is a calculated index.

Tip

Use the biomass line to monitor the current biomass in the echogram. This function writes an extra thick and brightly coloured curve on the echogram. The biomass line shows you the integrated biomass for the pings within the selected calculation interval. Change the scale to fit the vertical space available on the echogram. To add the biomass line to the echogram and change the scale, open the **Lines** *page in the* **Echogram** *dialog box.*

It is possible to convert the biomass index to weight (for example in metric tons). Based on practical use of the EK80 in different fisheries, you will soon be able to estimate the weight when you know the type of fish and their sizes.

Procedure

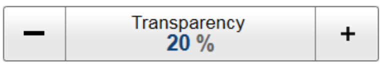
1 Click in the view you want to activate.

The active view is identified with a thicker border. The information provided will only be valid for the selected view.

2 On the top bar, select the appropriate button to open the information pane.

3 Click the bottom right corner of the information pane, and drag to requested size.

4 Select a **Transparency** setting that fits your requirements.

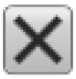


The chosen transparency percentage is used on all open information panes.

5 Investigate the information provided by the information pane.

The EK80 records all the targets from the smallest plankton to the largest whale. The biomass value is an indicator to how much fish you currently have in the beam. Every single fish will emit an echo, and the sum of all these registered echoes are presented as a number. Smaller organisms such as plankton will also emit echoes, but these are so weak that they will hardly influence on the total biomass.

6 Select **Close** in the top right corner to close the information pane.



Related topics

Biomass information pane description, page 474

Changing the calculation parameters for the Biomass information pane

The **Calculation Interval** settings define the parameters that are used to calculate the biomass. You can base the calculations on sailed distance, elapsed time, or a portion of the echogram view.

Context

The biomass and size distribution values are calculated based on the echo data collected by the EK80. Use the **Calculation Interval** settings to limit the source data used by these calculations. You can base the calculations on data collected

- within a given time frame
- from a defined number of pings
- from the data used to create a portion of the current view

The **Calculation Interval** parameters can accessed from two places in the EK80 user interface.

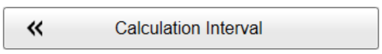
- The page is opened in the **Information Pane Options** dialog box.
- The dialog box is opened using the **Calculation Interval** button on the **Setup** menu.

The parameters are the same, it does not matter if you use the page or the dialog box.

Procedure

1 Open the **Setup** menu.

2 Select **Calculation Interval** to open the dialog box.



3 Adjust the setting to fit your requirements.

- Select **Distance** to allow the EK80 to make the calculations based on the echo data collected during a sailed distance.
- Select **Time** to make the calculations based on the echo data collected during the last elapsed seconds or minutes.
- Select **Ping** to make the calculations based on the echo data collected during the latest number of Acoustic transmissions (pings).

4 If relevant, select **Apply to All Channels** and/or **Apply to All Layers**..

5 Select **OK** to save the selected setting and close the dialog box.

Related topics

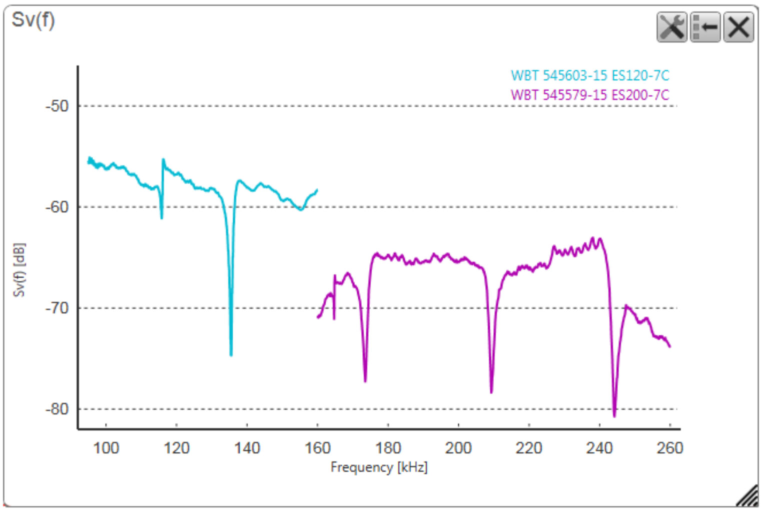
Biomass information pane description, page 474

Creating a *Sv(f)* information pane with echo data from multiple channels

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. In order to collect information from more than one channel in the *Sv(f)* information pane, you can use the **Combined View Settings** functionality to "combine" echo data from several channels.

Prerequisites

The dialog box can only be opened if you have more than one channel in your EK80 presentation. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.



Context

The **Combined View Settings** dialog box lists all your current channels. When activated, a dedicated view is created to hold the information pane and one echogram.

Procedure

1 Open the **Active** menu.

2 Select **Combined View Settings** to open the dialog box.

3 On the left side of the dialog box, select which channels to be included in the combined *Sv(f)* information pane.

4 On the right side, select which channel to be included in the dedicated channel view.

5 Select **OK** to close the dialog box.

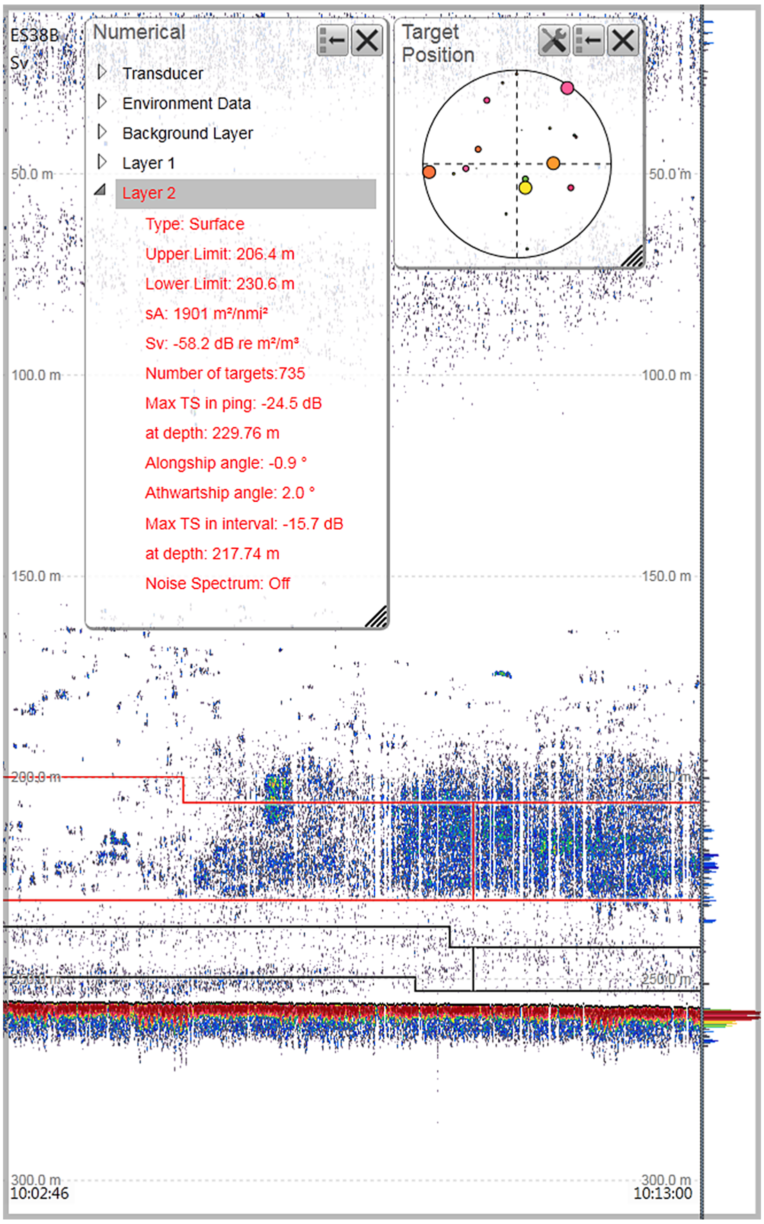
Related topics

Sv(f) information pane description, page 476
Combined View Settings, page 628

Monitoring the numerical information in a depth layer

The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Context



Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.

Note

The layers are a key function of the EK80. During normal operation, make sure that you are aware of the layer(s) that you have established, and that the requested layer is activated to feed information to the information panes.

Procedure

1 Click in any echogram view to make it active.

The data in the information pane is only valid for the selected channel. The active echogram view is identified with a thicker border.

2 On the top bar, select **Numerical**.

Observe that the *Numerical* information pane opens. The information from the current "active" layer is shown with red text. The information in the *Numerical* information pane is organized in collapsible lists. Each list can be opened or closed using the small triangle on the left side.

3 Select a different layer.

This is not relevant if you have only one layer, because it will always be "active". If you have two or more layers, there are two ways to do this:

a Click between the two layer indicator lines in the echogram.

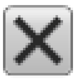
The line colours change to red.

b Select the relevant layer information in the *Numerical* information pane.

The colour of the layer data changes to red.

4 Investigate the information provided by the information pane.

5 Select **Close** in the top right corner to close the information pane.



Related topics

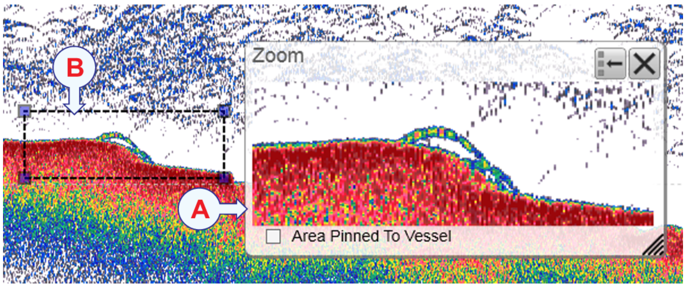
Working with depth layers in the echogram views, page 189
Numerical information pane description, page 478

Using the Zoom information pane to study details in the echogram

If you need to magnify a part of the echogram to study details, you can use the *Zoom* information pane.

Context

The *Zoom* information pane allows you to magnify a chosen area of the current echogram. Once the *Zoom* information pane is opened, the zoomed area is shown as a dotted rectangle in the view. You can change the size of the zoomed area, and you can move the rectangle anywhere inside the active view.



A *Zoom information pane*

B *Zoom rectangle used to define the size of the zoomed area*

In this screen capture, the zoomed area rectangle is positioned close to the *Zoom* information pane. You can however place the pane and the zoomed area independently anywhere you like inside the active view.

Each *Zoom* information pane export information. When opening the *Biomass* and/or the *Size Distribution* information panes, you will automatically receive information from each of the *Zoom* information panes that you have opened.

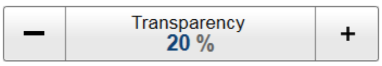
Procedure

1 Click in any echogram view to make it active.

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 On the top bar, select the appropriate button to open the information pane.

3 Select a **Transparency** setting that fits your requirements.



The chosen transparency percentage is used on all open information panes.

4 Position the zoom rectangle over the area in the echogram that you wish to investigate.

Click in the middle of the rectangle, and keep the mouse button depressed. Drag it to the requested position. Release the mouse button.

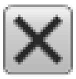
5 Click the corners of the zoom rectangle, and drag to change it to desired size.

6 Control the behaviour of the zoomed area.

Use **Area Fixed To Vessel** to control the behaviour of the zoom function. When the rectangular zoomed area is established, it can either follow the echogram while it moves towards the left, or it can stay put.

- When **Area Fixed To Vessel** is active, the zoomed area will be permanently positioned on the echogram. The echoes shift through the area, and therefore also shift through the *Zoom* information pane.
- When **Area Fixed To Vessel** is switched off, the zoomed area will "follow" the echogram data from right towards left.

7 Select **Close** in the top right corner to close the information pane.



Related topics

Zoom information pane description, page 486

Monitoring the supply voltage

The *Transceiver Power Supply* information pane shows you the current supply voltage provided to the transceiver. This is very useful if you operate your EK80 from a battery.

Context

If you operate your EK80 from a battery, it is very useful to keep an eye on the supply voltage. The EK80 software measures this supply voltage in the transceiver, and the result is automatically returned to the *Transceiver Power Supply* information pane.

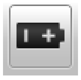
- As long as the supply voltage is kept between 11.5 and 15 Vdc, the transceiver will work normally.
- If the supply voltage drops to any value between 10 and 11.5 Vdc the transceiver will still work, but the EK80 will give you a message to say that the supply voltage is low.
- If the supply voltage drops to below 10 Vdc, the transceiver will stop. The EK80 will then notify you with another message.

One information pane shows you the supply voltage for all the transceivers in use on your EK80 system. The information pane shows the supply voltage for all transceivers that broadcast this information on the communication link to the Processor Unit. This includes the Wide Band Transceiver (WBT) and the General Purpose Transceiver (GPT). The WBT Mini and WBT Tube transceivers are also supported.

Procedure

1 Click in any echogram view to make it active.

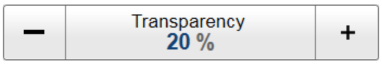
2 On the top bar, select *Transceiver Power Supply*.



3 Change the physical size and shape to fit your preferences.

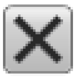
Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

4 Use the **Transparency** function to control how much you can see "through" the information pane.



You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%. The **Transparency** function is located on the **Display** menu.

5 Select **Close** in the top right corner to close the information pane.



Related topics

Maintaining the EK80, page 341
Transceiver Power Supply information pane description, page 488

Working with depth layers in the echogram views

Topics

Creating a new depth layer

Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis. You can create as many depth layers as you want on the EK80.

Context

Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

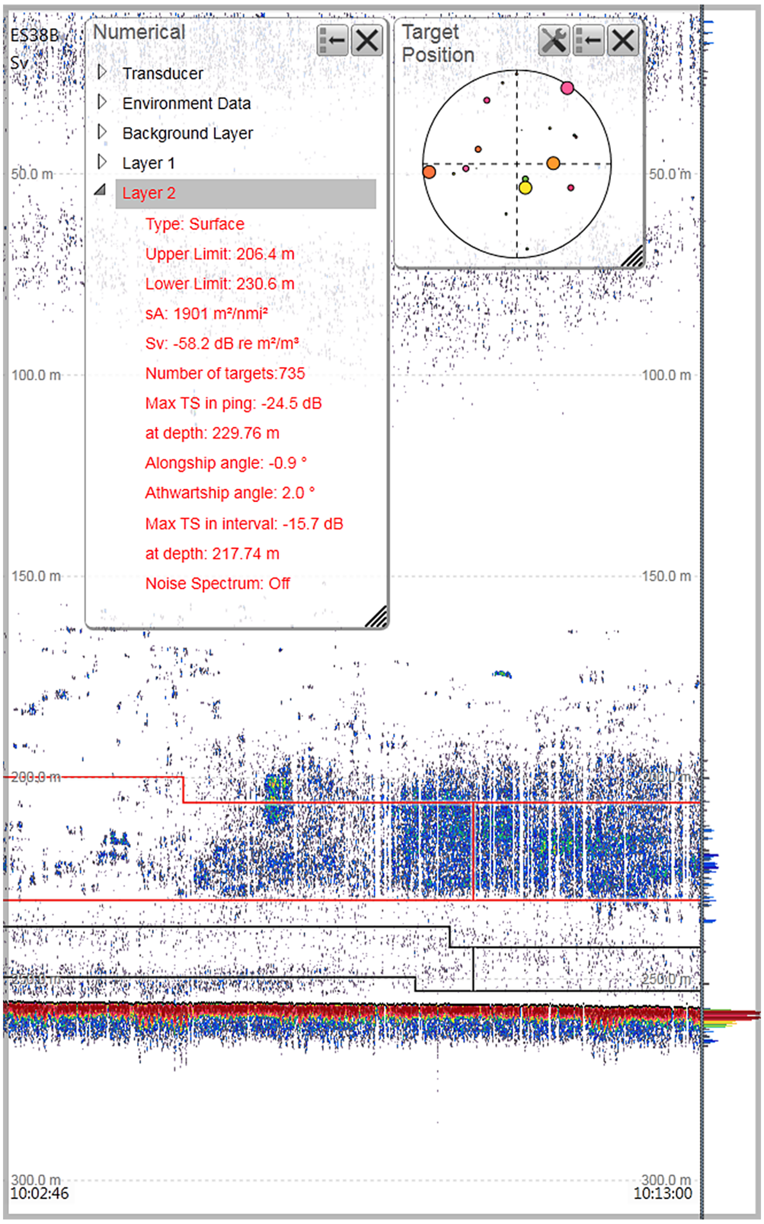
By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.

Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

Procedure

1 Open the **Active** menu.

2 Select **New Layer**.



Observe that the **New Layer** dialog box opens.

3 Select layer type.

- **Surface**: The range settings for the layer are referenced to the surface. The layer is downwards limited by the detected bottom depth if this value is shallower than the specified lower range limit for the layer. "Pings" without a bottom detection are ignored in the calculations.
- **Pelagic**: The range settings for the layer are referenced to the surface. The layer is not downwards limited by the detected bottom depth.

- **Bottom**: The range settings for the layer are referenced to the bottom. The layer is downwards limited by the detected bottom depth.

4 Define the start depth and the depth range of the layer.

- **Start Relative Surface**: When a *Surface* or *Pelagic* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the surface depth.
- **Start Relative Bottom**: When a *Bottom* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the bottom.
- **Range**: This parameter controls the vertical depth range for the layer. Positive values are always downwards. A start range relative to bottom of for example -10 m means 10 m above the bottom.

5 Set up the **Integration** parameters to match your requirements.

6 Select **OK** to save the selected settings and close the dialog box.

Result

When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

Further requirements

By default, any layer you create will be applied to all echogram views simultaneously.

In the echogram, you can click between the layer lines in the echogram view to select ("activate") it. The active layer is shown with red border lines. The information shown in your information panes only reflect the echo data from the currently "active" layer.

The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Related topics

Working with depth layers in the echogram views, page 189

Modifying the properties of an existing depth layer

You can create as many depth layers as you want on the EK80. Once a depth layer has been made you can change its properties using the **Layer Properties** dialog box.

Context

When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer. If you only wish to change the **Start Relative Surface**, **Start Relative Bottom** or **Range** settings, select the border lines in the "active" layer and drag them up and down.

Tip

The Numerical information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Procedure

1 Select an "active" layer.

   This is not relevant if you have only one layer, because it will always be "active". If you have two or more layers, there are two ways to do this:

   a Click between the two layer indicator lines in the echogram.

      The line colours change to red.

   b Select the relevant layer information in the *Numerical* information pane.

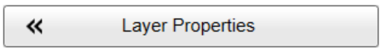
      The colour of the layer data changes to red.

2 If you only wish to change the **Start Relative Surface**, **Start Relative Bottom** or **Range** settings, select the border lines in the "active" layer and drag them up and down.

If you need to make other types of changes, you must open the **Layer Properties** dialog box.

3 Open the **Active** menu.

4 Select **Layer Properties**.



   Observe that the **Layer Properties** dialog box opens.

5 Select **New Layer**.

   Observe that the **New Layer** dialog box opens.

6 Select layer type.

   - **Surface**: The range settings for the layer are referenced to the surface. The layer is downwards limited by the detected bottom depth if this value is shallower than the specified lower range limit for the layer. "Pings" without a bottom detection are ignored in the calculations.
   - **Pelagic**: The range settings for the layer are referenced to the surface. The layer is not downwards limited by the detected bottom depth.

- **Bottom**: The range settings for the layer are referenced to the bottom. The layer is downwards limited by the detected bottom depth.

7 Define the start depth and the depth range of the layer.

- **Start Relative Surface**: When a *Surface* or *Pelagic* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the surface depth.
- **Start Relative Bottom**: When a *Bottom* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the bottom.
- **Range**: This parameter controls the vertical depth range for the layer. Positive values are always downwards. A start range relative to bottom of for example -10 m means 10 m above the bottom.

8 Set up the **Integration** parameters to match your requirements.

9 Select **OK** to save the selected settings and close the dialog box.

Related topics

Working with depth layers in the echogram views, page 189

Deleting a depth layer

You can create as many depth layers as you want on the EK80. The active layer is shown with red border lines. A single layer can be deleted if you do not need it any longer.

Context

When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

Tip

The Numerical information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Procedure

1 Select an "active" layer.

This is not relevant if you have only one layer, because it will always be "active". If you have two or more layers, there are two ways to do this:

a Click between the two layer indicator lines in the echogram.

The line colours change to red.

b Select the relevant layer information in the *Numerical* information pane.

The colour of the layer data changes to red.

2 Open the **Active** menu.

3 Select **Delete Layer**.

Related topics

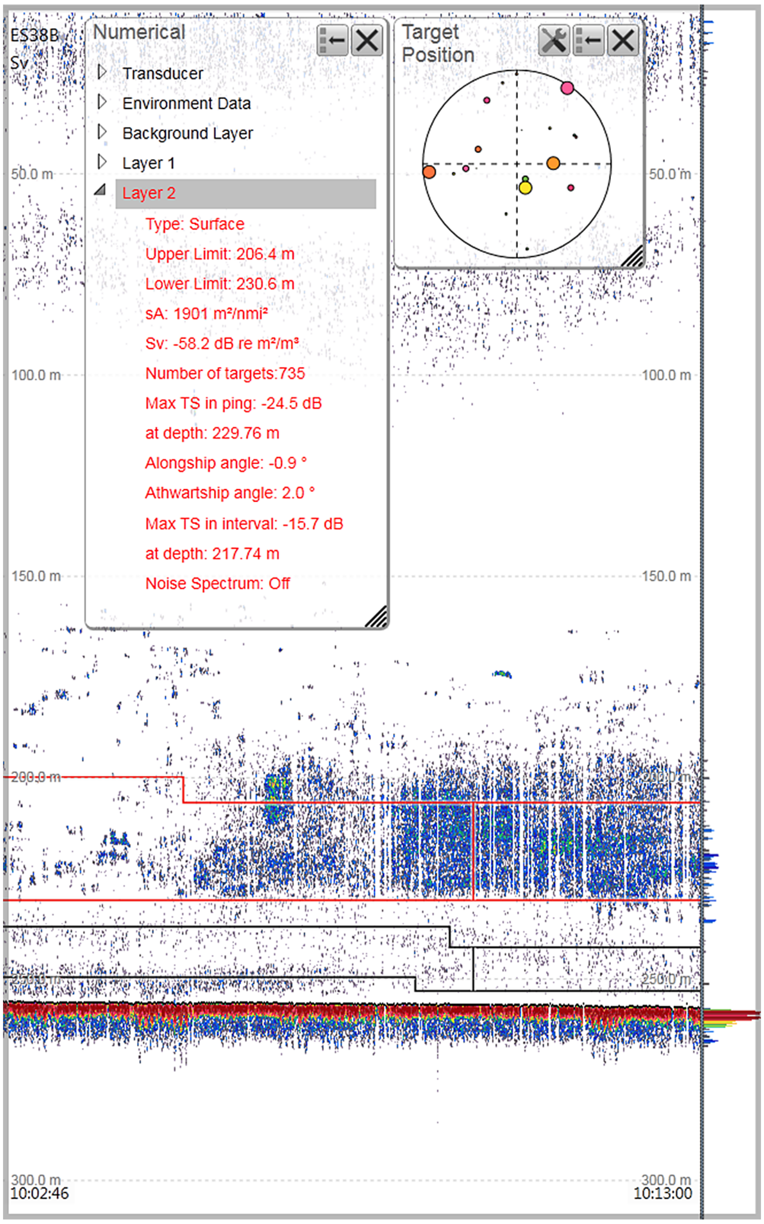
Working with depth layers in the echogram views, page 189

Monitoring the numerical information in a depth layer

The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Context

Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.



When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.

Note

The layers are a key function of the EK80. During normal operation, make sure that you are aware of the layer(s) that you have established, and that the requested layer is activated to feed information to the information panes.

Procedure

1 Click in any echogram view to make it active.

The data in the information pane is only valid for the selected channel. The active echogram view is identified with a thicker border.

2 On the top bar, select **Numerical**.

Observe that the *Numerical* information pane opens. The information from the current "active" layer is shown with red text. The information in the *Numerical* information pane is organized in collapsible lists. Each list can be opened or closed using the small triangle on the left side.

3 Select a different layer.

This is not relevant if you have only one layer, because it will always be "active". If you have two or more layers, there are two ways to do this:

a Click between the two layer indicator lines in the echogram.

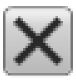
The line colours change to red.

b Select the relevant layer information in the *Numerical* information pane.

The colour of the layer data changes to red.

4 Investigate the information provided by the information pane.

5 Select **Close** in the top right corner to close the information pane.



Related topics

Working with depth layers in the echogram views, page 189
Numerical information pane description, page 478

Exploring water velocities using ADCP

These tasks are only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Note

The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Topics

Opening the ADCP pane

The *ADCP* information pane displays velocities in horizontal and vertical direction. Use this procedure to find and read the ADCP velocity information.

Context

Horizontal velocities are displayed in a compass rose. The vessel is displayed in the centre of the compass rose. Speed ranges are indicated using dotted circles around the vessel. The compass rose shows two different velocities.

- **Water velocity**

  Water velocity represents the water velocity estimated in the active layer. **Water velocity** is represented in magnitude and direction by a coloured vector arrow. The range of the active layer and the magnitude of the velocity is displayed in coloured text at the bottom of the information pane.

  Tip

  Default the active layer is set to the range of the water column. Create a new layer (or use an existing layer) if you wish to display the water velocity in a specific depth range in the water column To create a new layer, use the **New Layer** *dialog box. Click between the two layer indicator lines in the view to activate a layer.*

- **Bottom velocity**

  Bottom velocity represents the velocity with which the vessel is moving relative to the sea bottom. **Bottom velocity** is represented in magnitude and direction by a solid, black vector arrow.

Note

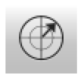
*Horizontal velocity can be estimated relative to the vessel (***Vessel Relative***) or relative to the sea bottom (***Geographical***). Vessel relative velocities will have the vessel velocity superimposed on the current velocity. Velocities relative to the sea bottom is composed of the current velocity only.*

Vertical velocity is displayed as an arrow in a diagram with vertical speed intervals marked. **Vertical velocity** displays the current velocity in the upward/downward direction.

Procedure

1 Select ADCP from the **Top bar**.

2 Set all parameters according to your needs.



Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Identifying vessel heading in the ADCP pane

The compass in the *ADCP* pane displays horizontal velocities in a certain depth range. You can use this procedure to enhance the view with a bow marker for the vessel.

Context

Horizontal velocities are displayed using a compass rose having the vessel in the centre. You can easily add a **Bow Marker** to this display. This will give a better visual information of the direction of the vessel related to the direction of the horizontal current.

Note

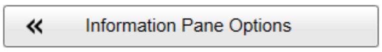
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Check the **Bow Marker** box by clicking in it.

To remove the **Bow Marker**, uncheck the **Bow Marker** box by clicking in it again.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Selecting compass orientation for horizontal water velocities

Velocity displays in the *ADCP* pane can be adapted to enhance visual information for water velocity. Use this procedure to set the orientation of the compass.

Context

The compass in the *ADCP* pane displays horizontal velocities in a certain depth range. The vessel is displayed in the centre of the compass rose. Speed ranges are indicated using dotted circles around the vessel. The orientation of the vessel as well as the compass rose can be adapted to your need of visualisation. The orientation of the vessel can be one of two options, **Bow Up** or **North Up**.

- **North Up**

  North Up means that the compass always displays north being "up". The **Bow Marker** points in the direction of the vessel movement. A **Bow Marker** can be added to the display.

- **Bow Up**

  Bow Up rotates the compass as the vessel heading changes. "up" in the *ADCP* pane matches the vessel moving forward direction.

Note

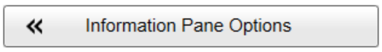
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

  You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Check the vessel orientation you would like to use by clicking in the circle.

  - **Bow Up** is often combined with the compass rose being oriented relative to the vessel's directions, **Vessel Relative** (fore/aft and port/starboard).
  - **North Up** is often combined with the compass rose being oriented relative to the cardinal directions, **Geographical**.

  To change the vessel orientation, click in another orientation option.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Changing the speed range display for horizontal current velocity

The horizontal current velocity is displayed in a compass rose at the left side of the *ADCP* information pane. Velocity displays in the *ADCP* pane can be adapted to enhance visual information for water velocity. Use this procedure to adapt the speed range and also the speed intervals marked to the magnitude of the velocity in the display.

Context

Horizontal velocities are displayed in a compass rose. The vessel is displayed in the centre of the compass rose. Speed ranges are indicated using dotted circles around the vessel. The velocities displayed in the compass are **Water velocity** and **Bottom velocity** The depth range for water velocities is defined in the active layer. Active layer is by default set to the range complete of the water column.

The current velocity is commonly displayed as an arrow. The length of the arrow represents the magnitude of the velocity while the tip of the arrow indicates the direction.

The current velocity can be broken down into components in three dimensions. Displaying the horizontal and vertical component of the current velocity provides a visualisation of the displacement of the current in these directions. This is useful in order to estimate the relative current velocity in the cardinal directions or relative to the vessel orientation, as well as to estimate the current velocity in the up/downward direction.

Adapting the maximum speed range to the maximum magnitude of the velocity provides a better visualisation of the velocity and the changes in the velocity. You can select the value for **Maximum Speed** by entering or selecting a specific value.

Note

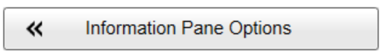
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Select an appropriate value for the **Maximum Speed**.

Maximum Speed is located in the **Horizontal** field.

Enter a specific value by using the small arrows to increase/decrease the value.

You can also select **Auto** to enable the ADCP software find a suitable value.

Velocity is measured in m/s or knots.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Selecting bearings for the horizontal velocities

Velocity displays in the *ADCP* pane can be adapted to enhance visual information for water velocity. Use this procedure to select the bearings for the horizontal velocities displayed in the *ADCP* pane.

Context

The horizontal velocities can be displayed using relative bearings (R) or true bearings (T).

- **Geographical**

  The horizontal velocities are displayed using true bearings. The compass rose is oriented according to the cardinal directions (north/south and east/west).

- **Vessel Relative**

  The horizontal velocities are displayed using relative bearings. The compass is oriented according to the vessel directions (fore/aft and port/starboard).

Note

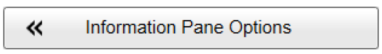
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Check the compass orientation you would like to use by clicking in the relevant box.

To change the compass orientation, click in another compass orientation.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Selecting horizontal velocities in *ADCP* pane

Velocity displays in the *ADCP* pane can be adapted to enhance visual information for water velocity. Use this procedure to select horizontal velocities do display in *ADCP* pane.

Context

Horizontal velocities are displayed in a compass rose. The vessel is displayed in the centre of the compass rose. Speed ranges are indicated using dotted circles around the vessel. The compass rose shows two different velocities.

- **Water velocity**

  Water velocity represents the water velocity estimated in the active layer. **Water velocity** is represented in magnitude and direction by a coloured vector arrow.

- **Bottom velocity**

  Bottom velocity represents the velocity with which the vessel is moving relative to the sea bottom. **Bottom velocity** is represented in magnitude and direction by a solid, black vector arrow.

Horizontal velocity can be estimated relative to the vessel (**Vessel Relative**) or relative to the sea bottom (**Geographical**).

- **Vessel Relative**

  Vessel relative velocities will have the vessel velocity superimposed on the current velocity.

- **Geographical**

  Velocities relative to the sea bottom is composed of the current velocity only.

Note

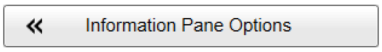
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

   You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Select **Velocity vector**

   Check the **Velocity vector** type you would like to use by clicking in its circle. To change the **Velocity vector** relativity, click in any of the other **Velocity vector** options.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Display vertical velocity in ADCP pane

The vertical water current velocity is displayed in the right side of the *ADCP* information pane. Use this procedure to add (or remove) the display from the information pane.

Context

The vertical current velocity display is optional in the *ADCP* information pane. The display shows current velocity in the vertical direction as an arrow pointing upwards if the current is moving upwards and downwards if the current is moving downwards.

The current velocity is commonly displayed as an arrow. The length of the arrow represents the magnitude of the velocity while the tip of the arrow indicates the direction.

The current velocity can be broken down into components in three dimensions. Displaying the horizontal and vertical component of the current velocity provides a visualisation of the displacement of the current in these directions. This is useful in order to estimate the relative current velocity in the cardinal directions or relative to the vessel orientation, as well as to estimate the current velocity in the up/downward direction.

The vertical current velocity display shows the vertical current velocity as it changes through a survey. The magnitude and direction of the current velocity will change as the current changes.

Note

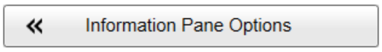
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Check the **Vertical** box by clicking in it.

To remove the vertical current velocity display , uncheck the **Vertical** box by clicking in it again.Enter a specific value by using the small arrows to increase/decrease the value.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Changing the speed range display for vertical current velocity

The vertical water current velocity is displayed in the right side of the *ADCP* information pane. Velocity displays in the *ADCP* pane can be adapted to enhance visual information for water velocity. Use this procedure to adapt the speed range and also the speed intervals marked to the magnitude of the velocity in the display.

Context

Vertical velocity is displayed as an arrow in a diagram with vertical speed intervals marked. **Vertical velocity** displays the current velocity in the upward/downward direction. The velocity arrow is defined by a set of parameters in the **ADCP** page in the *Information Pane Options*.

The length of the arrow represents the magnitude of the velocity while the tip of the arrow indicates the direction.Adapting the maximum speed range to the maximum magnitude of the velocity provides a better visualisation of the velocity and the changes in the velocity.

Note

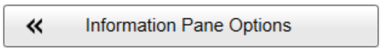
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **Information Pane Options**

You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.



3 Open the **ADCP** page.

4 Select an appropriate value for the **Maximum Speed**.

Maximum Speed is located in the **Vertical** field.

Enter a specific value by using the small arrows to increase/decrease the value.

You can also select **Auto** to enable the ADCP software find a suitable value.

Velocity is measured in m/s or knots.

5 Select **Apply** to save your choice.

6 Select **OK** to close the dialog box.

Related topics

Exploring water velocities using ADCP, page 197
ADCP information pane description, page 490
ADCP page, page 729
Acoustic Doppler current profiler, page 779

Adjusting the ADCP quality parameters

These tasks are only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Note

The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Topics

Enabling ADCP quality parameters

Error Velocity, **Correlation** and **Percent Good** are all quality measurements for the water velocity measures made in ADCP. They are used to filter out velocity measurements which do not pass the quality criteria. Use this procedure to enable these filters for the ADCP data.

Context

EK80 ADCP offers three different quality measurements for ADCP velocity data estimates. These are enabled/disabled using the **ADCP Editing** dialog box.

Error Velocity

Error velocity is the difference between two estimates of the vertical velocity. Low error velocity indicates the velocities in the ADCP beams are homogenous and of high quality.

The **Error Velocity** quality measurement applies to **Vessel Velocity** and **Geo Velocity** views and data.

When **Error Velocity** is enabled, velocity estimates with an error velocity value above the specified threshold value are removed, or edited out from the ADCP views and data.

Error Velocity is measured in m/s or knots.

Correlation

Correlation is a measure of similarity between the two sets of received echoes from which the velocity along each beam direction is estimated. If the difference is small, correlation is high and the signal sequences are similar. **Correlation** quality measurement applies to **Beam Velocity**, **Vessel Velocity** and **Geo Velocity**. When **Correlation** is enabled, velocity estimates with a value below the specified threshold value are removed, or edited out, from the ADCP views and data.

Correlation is measured in percent.

Percent Good

The **Percent Good** data is a measure of what fraction of velocity data which passed the error velocity and correlation threshold tests.

Percent Good quality measurement applies to **Vessel Velocity** and **Geo Velocity**. When Percent Good is enabled, velocity estimates having a percent good value below the specified threshold value are removed, or edited out, from the ADCP views and data.

Procedure

1 Open the **Active** menu.

2 Select **ADCP Editing**.

3 Check the check-box for each of the quality measurements you would like to include for the ADCP data.

4 Select **Apply** to save your choice.

5 Select **OK** to close the dialog box.

Setting the error velocity threshold value

Error velocity is a measure of quality for velocities measured in the ADCP beams. Low error velocity indicates the velocities in the ADCP beams are homogenous and of high quality. You can enable/disable the use of error velocity and set a threshold value for acceptable/unacceptable error velocity values. Use this procedure to set this threshold value for the error velocity.

Context

The *Error Velocity* view displays the quality measurement error velocity. Error velocity is the difference between two estimates of vertical velocity. It is calculated using beam velocity data. The differences in vertical velocity estimates can be due to inhomogeneities in the water velocity, noise or malfunctioning equipment.

The error velocity is managed using the **ADCP Editing** dialog box. Enabling the error velocity is done by checking the check box for error velocity in the ADCP editing dialog box. Velocity estimates with error velocity value above threshold value are edited out. This means that these velocities are not shown in the views for *Vessel Velocity* and *Geo Velocity* and they are not included in any ping average. The value of the **Error Velocity** must be set in relation to the scientific survey and the water conditions in the area.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **ADCP Editing**.

3 Select the appropriate error velocity threshold value.

  a Check the check box in order to enable and select a threshold value.

  b Enter a specific value by using the small arrows to increase/decrease the value.

  Enabling the threshold value will provide more correct velocity views in ADCP.

4 Select **Apply** to save your choice.

5 Select **OK** to close the dialog box.

Related topics

Adjusting the ADCP quality parameters, page 207
Acoustic Doppler current profiler, page 779
ADCP Editing dialog box, page 630

Setting the correlation threshold value

Correlation is a measure of quality for velocities measured in the ADCP beams. High correlation indicates a low level of noise for the signals and a high quality for the velocity estimates. You can enable/disable the use of corrolation data and set a threshold value for acceptable/unacceptable correlation values.Use this procedure to set this threshold value for the correlation data.

Context

Correlation is a measure of similarity between the two sets of received echoes from which the velocity along each beam direction is estimated.

If the difference is small, correlation is high and the signal sequences are similar. When **Correlation** is enabled, velocity estimates with correlation below the threshold value are edited out. This means these velocity estimates will not be shown in the velocity views and not included in ping average. Set the correlation threshold value to remove noisy measurements for correlations values lower than the threshold value.

The correlation threshold value is managed using the **ADCP Editing** dialog box. Enabling the correlation is done by checking the check-box for correlation in the **ADCP Editing** dialog box. Velocity estimates having a correlation value above or equal to the threshold value is included in **Beam Velocity**, **Vessel Velocity** and **Geo Velocity** views.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **ADCP Editing**.

3 Select the appropriate correlation threshold value.

 a Check the check box in order to enable and select a threshold value.

 b Enter a specific value by using the small arrows to increase/decrease the value.

 Enabling the threshold value will provide more correct velocity views in ADCP.

4 Select **Apply** to save your choice.

5 Select **OK** to close the dialog box.

Related topics

Adjusting the ADCP quality parameters, page 207
Acoustic Doppler current profiler, page 779
ADCP Editing dialog box, page 630

Setting the percent good threshold value

Percent good is a measure of quality for velocities measured in the ADCP beams. You can enable/disable the use of percent good data and set a threshold value for acceptable/unacceptable percent good data. Use this procedure to enable and set the percent good threshold value.

Context

The **Percent Good** data is a measure of what fraction of velocity data which passed the error velocity and correlation threshold tests.

Percent good is used for **Vessel Velocity** and **Geo Velocity**. It tells what fraction of pings passed both the error velocity and correlation threshold editing. **Beam Velocity** does not use this quality measurement.

The percent good fraction is calculated using the number of pings selected in **Ping Average**. When calculating ping average, only the velocities which have passed the error velocity and correlation editing are included. The percent good threshold sets the lower limit for what fraction of pings must have passed the other threshold edits. Averaged velocities, ADCP data, with percent good below this limit are not shown in the velocity views. You can enable the use of this filter function and you can adjust the threshold value using this procedure.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1 Open the **Active** menu.

2 Select **ADCP Editing**.

3 Select the appropriate percent good threshold value.

a Check the check box in order to enable and select a threshold value.

b Enter a specific value by using the small arrows to increase/decrease the value.

Enabling the threshold value will provide more correct velocity views in ADCP.

4 Select **Apply** to save your choice.

5 Select **OK** to close the dialog box.

Related topics

Adjusting the ADCP quality parameters, page 207
Acoustic Doppler current profiler, page 779
ADCP Editing dialog box, page 630

Setting up the ADCP presentation

These tasks are only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Note

The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Topics

Selecting which ADCP views to use

The EK80 supports several different ADCP data types. The ADCP data is shown in views in the EK80 presentation. You can change the type of ADCP data displayed in the views.

Context

Use the **ADCP View Settings** dialog box to select the ADCP views you want to see. The **View Selection** page allows you to choose which views to present, and how to organize them. The **ADCP View Settings** dialog box is located on the **Active** menu.

- *Vessel Velocity*

  The *Vessel Velocity* views display water velocities relative to the vessel. The views display water velocity in fore/aft and port/starboard direction as well as down towards the seafloor. Vessel speed is displayed separately.

- *Geo Velocity*

  The *Geo Velocity* views display water velocity relative to earth coordinates, i.e. water current velocity. The water current velocity is displayed in the cardinal directions (north-south, east-west), as well as velocity down towards the bottom. Water current speed is displayed in a separate view.

- *Beam Velocity*

  The *Beam Velocity* presentation displays the water velocity along the beam direction. The water is either moving towards of away from the ADCP transducer at the same angle as the vertical orientation of the beam (30 degrees). The *Beam Velocity* presentation includes one view for each beam.

- *Backscatter*

  Backscatter views display echo intensity in echograms, one for each of the ADCP beams. Backscatter data are output in decibel (dB).

- *Correlation*

  The *Correlation* views display a measure of the similarity between the received echoes. Correlation is a measure of data quality.

- *Error Velocity*

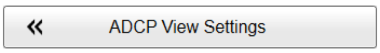
  Error velocity is the difference between two estimates of the vertical velocity. It is an important means to evaluate the data quality. Error velocity will show the magnitude of the errors, not the source.

- *Percent Good*

  The *Percent Good* view displays the percentage of pings which has passed a set of defined quality criteria. The rejection criteria include low correlation and large error velocity. The default threshold is defined in the **ADCP Editing** dialog box.

Procedure

1. Open the **Active** menu.
2. Select **ADCP View Settings**.

3. Select **View Selection** to open the page.
4. Scroll the list of available views.
5. Check the box for each view you would like to present.
6. Select view orientation.

   Tip

   - *Select* **Horizontal** *to examine data over a certain period of time or distance.*
   - *Select* **Vertical** *to observe the beams in comparison to each other, or to observe the same phenomenon in several beams.*

7 Select **Apply** to display the changes you have made

8 Select **OK** to save the selected setting and close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505
Units page, page 699

Selecting ADCP presentation on the bottom bar

The bottom bar in the EK80 presentation allows you to select which presentations you wish to see, and how these are organized. The EK80 offers separate tabs for ADCP and echogram views.

Context

The bottom bar is available all the time. The tabs on the bottom bar allows you to choose channel and presentation mode. By default a separate tab is provided for ADCP views. Using several ADCP presentation can be useful if you want to compare data using different **Ping Average** settings or other.

Tip

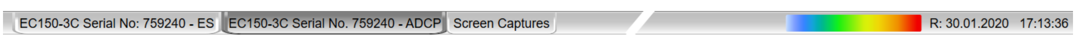
The **Docking Views** *function provided by the EK80 allows you to rearrange the physical positions of the views, and change their sizes. Once the* **Docking Views** *function is activated, the EK80 views are placed in named windows, and docking positions are shown. The docking positions show you where to drag and drop the selected view. Any view can selected, and then repositioned as indicated by the docking positions. This function is opened from the* **Display** *menu.*

The views are organized in presentation modes. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation. The phrase presentation mode is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

Procedure

1 Observe the bottom bar at the bottom of the EK80 presentation.



2 Select the appropriate tab to set up the presentation of ADCP data.

Related topics

Setting up the ADCP presentation, page 212

Changing the size of the ADCP views

You can modify the size of each individual ADCP view in the EK80

Context

The physical size of each echogram or other view can be changed individually. The content in a view that changes size will automatically be adjusted to take full advantage of the space available.

Procedure

1 Move the cursor to the border line between two views.

Observe that the cursor changes its shape; it now appears as two parallel lines with arrows pointing sideways or up/down.

2 Change the size of the view.

a Click on the left mouse button, and keep it depressed.

b Move the mouse - or roll the control wheel - and observe that the border line moves.

c Release the mouse button when the border line has been moved to desired position.

Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505

Placing ADCP views in separate windows

The **Add Window** dialog box makes it possible to create a new window for a dedicated ADCP presentation. The new window can contain other views than the existing presentation, or it can contain the same views but with different settings for the views. Use this procedure to create new ADCP presentation.

Prerequisites

The **Add Window** dialog box is always available, even if you only work with a single display. **Docking Views** must be switched on for the **Add Window** option to be available.You can only place a new window on a secondary display if your Processor Unit is fitted with a suitable graphic adapter, and the necessary adjustments have been made in the display driver.

Context

Using more than one ADCP presentation is useful for a number of reasons. It provides a great overview when you want to display much ADCP information on several displays or on a single large display. If you want to display the same ADCP data, but with different settings such as **Ping Average** of a subset of pings versus single ping data, this can be done using two ADCP presentations. When choosing settings for the ADCP data the **Apply to All** and **Apply to all channels** refers to all views in the active ADCP presentation.

Procedure

1 Open the **Display** menu.

2 Observe the **Docking Views** function.

Select the middle of the button to open it and access the available options.

3 Select **Add Window** to open the dialog box.

4 Select which channel to copy to a new window.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

5 Select **OK**.

The new window contains the chosen echogram channel. You can move this window to any display using the functionality provided by the operating system. To close the window, click the "X" in its top right corner.

You can repeat this as many times necessary, and thus establish a separate window for each echogram channel.

Related topics

Setting up the ADCP presentation, page 212
Add Window dialog box, page 749
Velocity measurement views, page 505

Changing the colour span for velocity views

The colour span used for the ADCP velocity views has a bipolar colour scale. Use this procedure to adapt maximum values of the colour span to the velocity data you are displaying.

Context

To get the most information from the velocity views it is important that the colour span is adapted to the actual velocities which are displayed. The intensity of the colour reflects the magnitude of the velocity. If the colours span range is set to a much higher magnitude than what is being displayed, you will loose detailed information of the velocity differences. Likewise in the opposite case if the displayed velocities had a higher magnitude than the range of the colour span.

Note

The changes you make are by default applied to all views in the current ADCP presentation. By clicking inside an ADCP view for velocity, you activate the view and options for **ADCP Colour Span** *will be available in the* **Active** *menu. In order to use different ADCP colour span settings, use two separate ADCP presentations.*

Procedure

1 Click inside one of the ADCP views.

2 Open the **Active** menu.

3 Select a **Colour Span** setting that fits your requirements.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it. You can choose any of the predetermined options in the list.

Related topics

Setting up the ADCP presentation, page 212
ADCP Colour Span function, page 607

Reducing the random errors in ADCP measurements

There will always be random noise in water velocity estimates. The random noise can be reduced by using the averaging the velocity estimates over a fixed number of pings. Use this function to reduce the random noise by using the **Ping Average** function.

Context

Using single pings to calculate ADCP data may result in velocity errors which are too large to meet the measurement requirements. Therefore the **Ping Average** function can be used in a *sliding average* of pings to calculate the velocity data. The calculation then relies on a fixed subset size, **Ping Average**, and a series of pings. The averaging operation reduces the ensemble noise of a a factor of approximately $\sqrt{N}$, N being the number of averaged pings. Ping average represents the number of pings used to create these subsets of pings used to calculate the moving average.

Note

For scientific operations, select the **Ping Average** *value according to survey requirements.*

Procedure

1 Click inside one of the ADCP views.

Note

The changes you make are by default applied to all views in the current ADCP presentation.

2 Open the **Active** menu.

3 Select a **Ping Average** setting that fits you requirements.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it. You can choose any of the predetermined options in the list.

Related topics

Setting up the ADCP presentation, page 212
Ping Average function, page 608

Selecting the horizontal scale in the ADCP views

The horizontal scale controls how fast the ADCP data move from right towards left across the EK80 presentation You can change the horizontal scale on the **Horizontal Axis** page in the **ADCP View Settings** dialog box.

Context

ADCP data such as velocity, percent good, back scatter and echograms to mention a few, travel from right towards the left across the ADCP presentation. On the **Horizontal Axis** page you can choose the horizontal scale of the ADCP data. This controls the “speed” of the ADCP data being presented.

- **Distance**: The horizontal scale is based on sailed distance. Select resolution and unit.
- **Time**: The horizontal scale is based on time. Select resolution and unit.
- **Ping**: The horizontal scale is based on the number of transmissions (“pings”) made. Select **View Size** to specify that the number of horizontal pixels shall define the number of displayed horizontal pings using one ping per pixel.
- **Speed**: The horizontal scale is based on the relative speed you choose. Select speed with the ruler.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

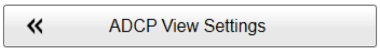
Procedure

1 Click once in the view that you wish to change.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **ADCP View Settings**.



4 Select **Horizontal Axis** to open the page.

5 Select the horizontal scale you want to use.

6 Apply the change you have made.

a Select **Apply** to apply the chosen setting only to the currently active view.

Tip

Select **Apply To All Channels** *to use the chosen settings on all the views in the ADCP presentation.*

7 Select **OK** to close the dialog box.

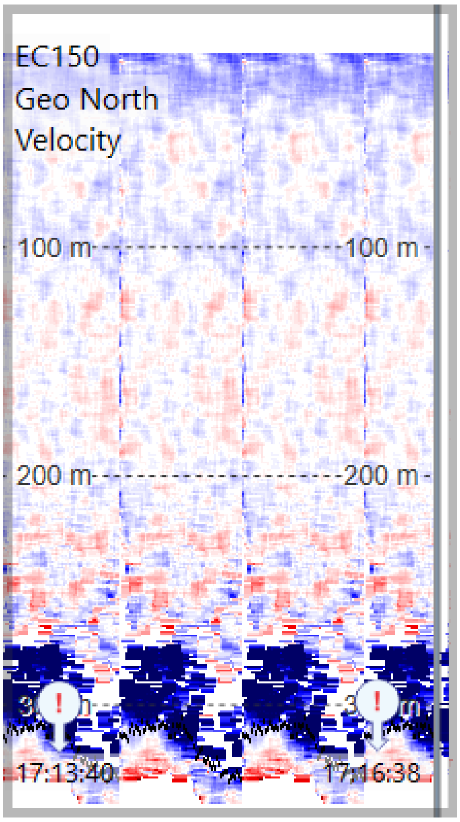
Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505

Adding scale labels to the ADCP views

In order to identify the horizontal scale in you ADCP views, you can add scale labels.

Context



Small labels are shown in the bottom left and right corners of the ADCP views. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

The following label options are available.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

This is a visual enhancement. It does not have any effect on the EK80 performance.

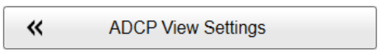
Procedure

1 Click once in the view that you wish to change.

The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **ADCP View Settings**.



4 Select **Horizontal Axis** to open the page.

5 Choose the label you wish to use.

6 Apply the change you have made.

Select **Apply** to apply the chosen setting only to the currently active view.

Select **Apply To All Channels** to use the chosen settings on all the views in the ADCP presentation.

7 Select **OK** to close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505

Enhancing bottom contour in ADCP views

In order to make the bottom easier to identify, certain visual enhancements may be applied. These enhancements are made using the **Lines** page in the **ADCP View Settings** dialog box.

Context

The following enhancements can be used to increase the readability of the bottom contour.

- **Bottom Line**

  The **Bottom Line** can be added to your ADCP data to enhance the visual bottom detection. It appears as thin line that follows the bottom contour. The line is drawn in the current foreground colour.

- **White Line**

  The **White Line** can be added to your ADCP data to enhance the visual bottom detection. It appears as thick line in the current background colour (normally white) that follows the bottom contour. This line will not remove information, it will simply "push" the echo information further down in order to make the bottom easier to see.

You can use the white and the bottom lines simultaneously.

Note

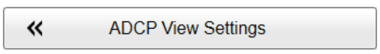
This is a visual enhancement. It does not have any effect on the EK80 performance.

Procedure

1. Click once in the view that you wish to change.

   The view is activated. It is identified with a thick border.

2. Open the **Active** menu.
3. Select **ADCP View Settings**.

4. On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
5. Under **Bottom** select **White Line** and/or **Bottom Line** to suit your preferences.

6 Apply the change(s) you have made.

  a Select **Apply** to apply the chosen setting only to the currently active view.

Tip

Select **Apply To All Channels** *to use the chosen settings on all the views in the ADCP presentation.*

---

7 Select **OK** to close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505

Setting the drawing range for the ADCP views

The ADCP views display echograms and velocity views for a water column ranging from the vessel to the sea floor (or maximum range of the transducer). The four different ADCP beams, which are set at an angle, provide a possibility display the depth range of the ADCP views in different ways. Use this procedure to select appropriate drawing range for your survey.

Context

Drawing range defines the depth range used for the ADCP views. This is purely a visual setting for the views. Each of the ADCP beams are set at a 30 degrees angle to the vertical centre line of the ADCP transducer.The four beams from the ADCP transducer will hit bottom at different range due to their different directions and due to the varying topography of the sea floor. If the sea floor contains steep ascents/descents the difference between the first last beam to hit the sea floor can be significant. Water velocity calculations will be performed according to the range specified.

- **Full**: Drawing range is specified by the number of samples available. The drawing range in the ADCP views will be the range of the ADCP transducer. This is limited by view range and recording range set in the user interface.
- **First Bottom Hit**: Drawing range is defined from the vessel to the depth at which the first of the ADCP beams hits the sea floor.
- **Last Bottom Hit**: Drawing range is defined from the vessel to the depth at which the last ADCP beam hits the sea floor.

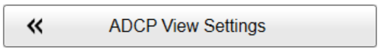
Procedure

1 Click once in the relevant view.

  The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **ADCP View Settings**.



4 On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.

5 Select the drawing range to suite you preferences in the **Drawing Range** field.

6 Apply the change(s) you have made.

 a Select **Apply** if you wish to apply the chosen setting only to the currently active echogram view.

 b Select **Apply to All** if you wish to use the chosen setting on all the echograms of the same type.

7 Close the dialog box.

Related topics

Setting up the ADCP presentation, page 212

Adding vertical marker lines to the ADCP views

In order to create a horizontal scale , you can add short vertical marker lines to you ADCP data. These lines are used to measure time or distance.

Context

The following options are available:

- **None**: No vertical markers are shown.
- **Time**: A short vertical line is drawn in the upper part of the ADCP view once every specified number of minutes.
- **Distance**: A short vertical line is drawn in the upper part of the ADCP view once every specified number of nautical miles.

Note

This is a visual enhancement. It does not have any effect on the EK80 performance.

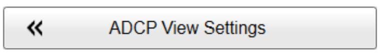
Procedure

1 Click once in the view that you wish to change.

 The view is activated. It is identified with a thick border.

2 Open the **Active** menu.

3 Select **ADCP View Settings**.



4 On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.

5 Under **Ticks** select the vertical marker lines you want to use.

6 Apply the change(s) you have made.

Select **Apply** to apply the chosen setting only to the currently active view.

Select **Apply To All Channels** to use the chosen settings on all the views in the ADCP presentation.

7 Select **OK** to close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Pages in the ADCP View Settings dialog box, page 739
Lines and markers, page 519
Velocity measurement views, page 505

Adding comments and annotations to ADCP views

When you study ADCP data, it is often useful to add personal comments to it to enhance occurrences at specific time intervals or distances. Several different annotation types may be added to the ADCP data. They are displayed on the ADCP view if this feature is enabled in the **ADCP View Settings** dialog box.

Context

Use the **Annotations** page to type comments and insert annotations into views. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. The **Annotations** page is located in the **Installation** dialog box.

The **Lines** page in the **ADCP View Settings** dialog box allows you to enable or disable annotations in the ADCP views. Annotations can only be added to views while in *Normal* operational mode.

When you save raw data, the annotations you have defined are stored as annotation datagrams.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Annotations**.

4 Specify the annotations you wish to use, and how you wish to trigger them.

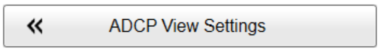
5 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

6 Click once in the view that you wish to change.

The view is activated. It is identified with a thick border.

7 Open the **Active** menu.

8 Select **ADCP View Settings**.



9 The **Lines** page in the **ADCP View Settings** dialog box allows you to enable or disable annotations in the ADCP views.

10 Select the type of annotation you wish to use.

11 Apply the change(s) you have made.

Select **Apply** to apply the chosen setting only to the currently active view.

Select **Apply To All Channels** to use the chosen settings on all the views in the ADCP presentation.

12 Close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Annotations page, page 702

Adding a single text comment to an ADCP view

Sometimes it can be useful to place a single written comment on the ADCP data. The **Manual Annotation** dialog box offers that function.

Context

Several different annotation types may be added to the echograms or other views. Annotations can only be added to views while in *Normal* operational mode.

Tip

Use the **Annotations** *page to type comments and insert annotations into views. The* **Annotations** *page is located in the* **Installation** *dialog box.*

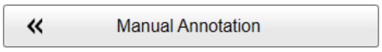
Procedure

1 Click once in the relevant view.

The view is activated. It is identified with a thick border.

2 Open the **Setup** menu.

3 Select **Manual Annotation**.



4 Type any text into the box.

The size of the box will adjust to the length of your text.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

5 Select **OK** to place the annotation in the echogram.

6 Select **Cancel** to close the dialog box.

Related topics

Setting up the ADCP presentation, page 212
Manual Annotation dialog box, page 596

Working with a mission plan

Topics

Creating a new mission plan

A mission plan consists of a set of ping configurations and information on how to execute the pings these configurations represent. The different ping configurations defined are gathered into ping groups. The ping groups can be executed repeatedly in what is named ensembles. The mission plan includes any number of ensembles and each ensemble may be repeated a fixed number of times.

Prerequisites

- You are familiar with the objective of the survey and how the echo sounder works.
- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

Context

You start making a mission plan in **Mission Planner** dialog box defining which transducer(s) you want to use. Then you specify how you want to perform your data acquisition (pinging). You do this by defining a set of ping configurations called ping groups. Finally, you place the ping groups in ensembles. In an ensemble you group a number of different ping configurations and this group is executed repeatedly for a fixed number of times.

Procedure

1 Select **Mission Planner**.

Mission Planner is located in the **Setup** menu.

2 Select **Mission Plan**.

Mission Plan is locate at the far left side of the **Mission Planner** dialog box.

The **Created Missions** list displays all created ensembles.

The **Mission** field displays information regarding the current mission plan.

3 Select **New**.

The first entry in the **Created Mission** list, **New**, is used for creating a new mission plan.

4 Type a name for the mission.

Note

When you provide a name, you can save your setup. It is not possible to copy and share mission plans between different EK80 systems. EK80 parameter values included in the mission plan are specific for each EK80 installation.

5 Select the ensembles to include in the mission plan.

Available ensembles lists the ensembles which can be used in a mission plan.

a Click on the ensemble to include in the mission.

b Click on the **Include** button next to **Available Ensembles**.

The selected ensemble will appear in the **Current Ensembles** list.

c Select **Iterations** for the ensemble if you want to repeat the ensemble pattern for a fixed number of times.

6 Select **Add** to save.

Related topics

Working with a mission plan, page 227
Pages in the Mission Planner dialog box, page 659

Editing a mission plan

Any mission plan can be altered at a later stage to better suite the objective of a survey. Opening a mission plan for editing is done through the **Mission Planner** dialog box.

Prerequisites

- A mission plan has been created and saved previously.
- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

Context

A mission plan in the EK80is defined by ping, ping groups and ensembles which are repeated a fixed number of times. A mission plan in the EK80is defined by ping, ping groups and ensembles which are repeated a fixed number of times. The mission plan is built from defined pings, ping groups and ensembles which all can be altered. It is important to identify which of these parameters that needs to be changed as they represents different levels of the mission plan. At the lowest level the mission plan is built from defined pings. The ping configuration decides how you perform your data acquisition. Editing a mission plan is sometimes necessary and is done through the **Mission Planner** dialog box.

By selecting the ping, ping group or ensemble you define which alterations you prefer to do.

- Select **Ping**.

  You can change the parameters for individual pings. This includes channel, frequency, pulse type, mode and so on.
- Select **Ping Group**.

  You can change the parameters for individual ping groups. This includes **Ping Mode** and pings included in the group.
- Select **Ensemble**.

  You can change the parameters for individual ensembles. This includes which ping groups are included in the ensemble and the number of repetitions for each group.
- Select **Mission Plan**.

  You can change the parameters for individual mission plans. This includes which ensembles are included in the mission plan and the number of repetitions for each ensemble.

Note

Changing the name of any ping, ping group or ensemble result in defining a new ping, ping group or ensemble.

Procedure

1 Select **Mission Planner**.

Mission Planner is located in the **Setup** menu.

2 Select the ping, ping group, ensemble or mission plan you would like to change.

3 Make the desired changes.

4 Select **OK** to save the chosen settings.

Related topics

Working with a mission plan, page 227
Pages in the Mission Planner dialog box, page 659

Creating a mission plan with several ping groups

A mission plan consists of a set of ping configurations and information on how to execute the pings these configurations represent. The different ping configurations defined are gathered into ping groups. The ping groups can be executed repeatedly in what is named ensembles. The mission plan includes any number of ensembles and each ensemble may be repeated a fixed number of times.

Prerequisites

- You are familiar with the objective of the survey and how the echo sounder works.
- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

Context

This is an example where you create a mission plan consisting of ping configurations, ping groups and ensembles.

In the mission plan there will be two different ping configurations, one for active mode and one for passive mode. The two ping configurations are included into one separate ping group each, one for active and one for passive pings. These two ping groups will be included in an ensemble. In the ensemble the active mode pings will be executed 50 times and the passive mode pings will be executed 10 times. The ensemble, when included in the mission plan runs with 3 iterations.

Tip

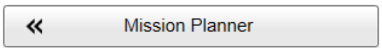
When the mission plan includes only one ensemble, as in this example, the number of iterations is not relevant. The mission plan will be repeated until you manually stop the execution. If the mission plan includes more than one ensemble, the number of repetition for each of the ensembles must be specified.

You start making a mission plan in **Mission Planner** dialog box defining which transducer(s) you want to use.

Procedure

1 Select **Mission Planner**.

Mission Planner is located in the **Setup** menu.



2 Create two ping configurations, one for passive mode and one for active mode.
   a Select **New** in the **Ping** page.
   b Type a name for the ping configuration.
   c Enter the parameters for the ping configuration.
   d Select **Add** to save the ping configuration.
   e Repeat the steps for the next ping configuration.
3 Create two ping groups, one for each ping configuration.
   a Select **New** in the **Ping Group** page.
   b Type a name for the ping group.
   c Add a ping configuration to the ping group.
   d Select **Save** to save the ping group configuration.
   e Repeat the steps for the next ping group configuration.
4 Create a new ensemble.
   a Select **New** in the **Ensemble** page.
   b Type a name for the ensemble.
   c Add the two ping groups created to the new ensemble.
   d Select the number of iterations for active ping group: 50
   e Select the number of iterations for passive ping group: 10
   f Select **Add** to save.
5 Create a new mission plan.
   a Select **New** in the **Mission Plan** page.
   b Type a name for the mission plan.
   c Add the new ensemble.
   d Select the number of iterations for the ensemble: 3
   e Select **Add** to save.

Result

The mission plan is ready.

Related topics

Working with a mission plan, page 227
Pages in the Mission Planner dialog box, page 659

Uploading and activating a mission plan

Once a mission plan has been created and saved, you can use the plan actively in EK80.

Prerequisites

- A mission plan is complete, checked and saved.

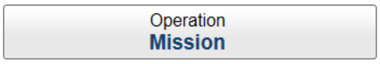
Context

Caution

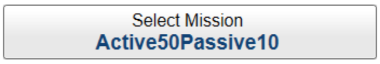
You must never set the EK80 to "ping" unless the transducer is submerged in water. Most transducers are damaged beyond repair if they transmit in open air. Prevent inadvertent use of the EK80 whenever a transducer is not submerged.

Procedure

1. Open the **Operation** menu.
2. On the **Operation** menu, set **Operation** to *Mission*.

   The EK80 is now ready for use.
3. Select **Select Mission** to choose the preferred mission.

   The mission is now ready for use.
4. Set **Ping** to *On*.

   The **Ping** function enables or disables the EK80 transmissions into the water. **Ping Mode** and **Ping Interval** parameters are set in the mission plan.

Result

Your mission plan has been activated.

Related topics

Working with a mission plan, page 227
Pages in the Mission Planner dialog box, page 659
Select Mission function, page 578

Deactivating a mission plan

If you for some reason need to abort a planned mission, the mission plan can be deactivated at any time. It is important to do this if there is a risk that pinging will start when the transducers are not submerged in water.

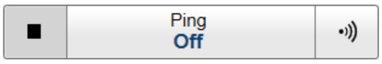
Prerequisites

- A mission plan is activated.

Procedure

1 Open the **Operation** menu.

2 Set **Ping** to *Off*.



3 Set **Operation** to *Inactive*.

Result

Your chosen mission plan has been deactivated.

Related topics

Working with a mission plan, page 227
Pages in the Mission Planner dialog box, page 659

Working with pings, ping groups and ensembles

Topics

Creating a ping for mission planning

For mission planning in the EK80 you create one or more pings which are used to set up a specific ping pattern in a mission. These pings are created using the **Mission Planner** dialog box.

Prerequisites

- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

Context

A ping defines the properties of a transmission (ping) from a specific transducer. You can define multiple numbers of pings and combine these into ping groups for the specific transducer. Each ping is defined with a name you choose. The pings are listed under **Pings** in the **Mission Planner** dialog box.

Procedure

1 Select **Mission Planner**.

   Mission Planner is located in the **Setup** menu.

2 Select **Ping** in the far left list in the **Mission Planner** dialog box.

3 Select **New**.

   New is located in the top of the **Created Pings** list.

   Parameters for the ping are displayed in the **Ping** field to the right in the **Mission Planner** dialog box.

4 Type a name for the ping

   Note

   When you provide a name, you can save your setup.

5 Select transducer in the **Channel** list.

You can define several ping configurations for each transducer listed.

Select **Edit** to change any of these pings at a later stage.

6 Define parameters for the ping.

Parameters which are related to ping configuration are pulse duration, frequency, ramping and such.

7 Select **Add**.

The ping configuration is now saved.

Related topics

Working with pings, ping groups and ensembles, page 234
Pages in the Mission Planner dialog box, page 659

Creating a ping group

Transducers are assigned a ping group and will accomplish various tasks based on your configuration settings.

Prerequisites

- One or more ping must have been saved previously.
- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

Context

A ping group defines the properties of each transmission ("ping") for each transducer. You can define multiple ping groups for each mission. Each ping group is defined with a name that you choose. Ping groups can be collected in **Ensembles**.

Procedure

1 Select **Mission Planner**.

Mission Planner is located in the **Setup** menu.

2 Select **Ping Group** in the far left list in the **Mission Planner** dialog box.

Ping Group is located at the far left side of the **Mission Planner** dialog box. Observe that the **Created Ping Groups** and **Ping Group** fields are displayed to the right of the dialog box.

The **Created Ping Groups** list displays all previously created ping groups as well as the option of creating a new.

In the **Ping Group** field displays information regarding a ping group.

3 Select **New**.

New is displayed at the top of the **Created Ping Groups** list.

4 Enter the parameters for the ping group.

   a Type a name for the ping group.

   Note

   When you provide a name, you can save your setup.

   b Select **Ping Mode**.

   Use **Ping Mode** to control how often the EK80 shall transmit its energy into the water.

   The EK80 transmits (pings) with a fixed time interval. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping). If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible.

5 Select a ping to include in the ping group.

   You select and add pings to the current ping group one by one.

   a Select a ping from the **Available Pings** list by clicking on it.

   b Click on the button next to the **Available Pings** list.

   The selected ping will appear in the **Current Ping Group Pings** list. Details of the ping will also appear at the bottom of the **Ping Group** field. Click on the arrow next to the name to expand the information.

6 Select **Add** to save.

Related topics

Working with pings, ping groups and ensembles, page 234
Pages in the Mission Planner dialog box, page 659

Creating the ensembles

An ensemble is a collection of one or more ping groups. It allows you to have different types of pings in a series. A series of pings may for example consist of 8 CW pings followed by 2 FM pings. You can also combine active and passive pinging.

Prerequisites

- One or more ping groups must have been saved previously.
- The EK80 is running in *Normal* operating mode.
- All transducers used in a mission plan must be installed in the EK80.

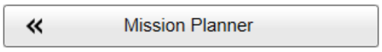
Context

An ensemble is a collection of one or more ping groups. The intention of an ensemble is to perform repeating sets of different configurations.

Procedure

1 Select **Mission Planner**.

Mission Planner is located in the **Setup** menu.



2 Select **Ensemble** in the far left list in the **Mission Planner** dialog box.

Ensemble is locate at the far left side of the **Mission Planner** dialog box. Observe that the **Created Ensembles** and **Ensemble** fields are displayed at the right of the dialog box.

The **Created Ensembles** list displays all created ensembles.

The **Ensemble** field displays information regarding the current ensemble.

3 Select **New**.

The first entry in the **Created Ensemble** list, **New**, is used for creating a new ensemble.

4 Type a name for the ensemble.

Note

When you provide a name, you can save your setup.

5 Select ping groups to include in the ensemble.

Available Ping Groups lists the ping groups which can be used in an ensemble.

a Click on the ping group to include in the ensemble.

b Click on the **Include** button next to **Available Ping Groups**.

The selected ping group will appear in the **Current Ensemble Ping Groups**. Details of the ping group and pings will appear at the bottom of the **Ensemble** field.Click on the arrow next to the name to expand the information.

c Select **Iterations** for the ping group if you want to repeat the ping group for a fixed number of times.

6 Select **Add** to save.

Related topics

Working with pings, ping groups and ensembles, page 234
Pages in the Mission Planner dialog box, page 659

Setting up presentation modes and views

Topics

Placing echogram channels in separate windows on multiple displays

The **Add Window** dialog box makes it possible to create a new window for a dedicated echogram presentation. The new window can contain a copy of an existing echogram channel, or it can be used to present a channel that is currently not visible.

Prerequisites

The **Add Window** dialog box is always available, even if you only work with a single display. You can only place a new window on a secondary display if your Processor Unit is fitted with a suitable graphic adapter, and the necessary adjustments have been made in the display driver.

Context

Computers with graphic adapters supporting more than one display are fairly common. The **Add Window** function has been implemented to show echogram presentations on multiple displays. The function is also useful if your Processor Unit is only fitted with a large single display.

Procedure

1. Open the **Display** menu.
2. Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.
3. Select **Add Window** to open the dialog box.

4 Select which channel to copy to a new window.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

5 Select **OK**.

The new window contains the chosen echogram channel. You can move this window to any display using the functionality provided by the operating system. To close the window, click the "X" in its top right corner.

You can repeat this as many times necessary, and thus establish a separate window for each echogram channel.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593
Add Window dialog box, page 749

Rearranging the layout of the EK80 presentation

The information from each channel is shown in a separate view. With the **Docking Views** function you can move and re-size the views in the EK80 presentation.

Context

The physical location and size of each view can be changed individually. The content in a view that changes size will automatically be adjusted to take full advantage of the space available.

Procedure

1 We recommend that you first save your current user settings.

When a complete reorganisation of the view positions and sizes have been completed , you may wish to restore the EK80 presentation to what it was *before* you changed it. You must use the **User Settings** dialog box to do this. We suggest that you save your current user settings before you activate the **Docking Views** function.

a Observe the **Main** menu.

b Select **User Settings**.

c Select **Save Current Setting**.

d Type a name for the user setting.

e Select **OK** to save the chosen name.

f Select **OK** to close the dialog box.

2 Open the **Display** menu.

3 Set **Docking Views** to *On*.

4 Click in the title bar of the view that you want to move.

The frame of the selected view will change colour to indicate that it has been selected.

5 Press the mouse button, and keep it depressed to drag the selected view to another position in the EK80 presentation.

The docking positions show you where to drag and drop the selected view. Any view can selected, and then repositioned as indicated by the docking positions.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593

Moving a view to another display

The echograms take up the largest part of the EK80 presentation. The information from each channel is shown in a separate view. If you have several displays connected to your Processor Unit you can even move selected views to another display.

Context

The physical location and size of each view can be changed individually. The content in a view that changes size will automatically be adjusted to take full advantage of the space available.

Procedure

1 Open the **Display** menu.

2 Set **Docking Views** to *On*.

3 Click in the title bar of the view that you want to move.

The frame of the selected view will change colour to indicate that it has been selected.

4 Press the mouse button, and keep it depressed to drag the selected view to another display.

Further requirements

To move a view back onto the main display, select it, and drag it over. Place the view among the other views as indicated by the docking positions.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593

Restoring the locations and sizes of the views

If you have used the **Docking Views** function to rearrange the position and size of your views, a dedicated function is available to restore all the views to their default positions. You can use the **User Settings** dialog box and functions to switch between your favourite view settings.

Context

With the **Docking Views** function you can move and re-size the views in the EK80 presentation. When a complete reorganisation of the view positions and sizes have been completed , you may wish to restore the EK80 presentation to what it was *before* you changed it.

The **Reset layout** function restores all the views to their default positions.

Procedure

1 Open the **Display** menu.

2 Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.

3 Select **Reset Layout** to restore the default view configuration.

If you wish to change the views to a configuration you have used before, you must fetch it from the user settings. Of course, you can only do this if you have saved it.

4 On the **Main** menu, select **User Settings**.

5 Select the preferred user setting.

6 Select **Activate Selected Setting**.

Result

All views are placed back to their original or previous positions and sizes.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593

Rearranging the tabs at the bottom of the EK80 presentation

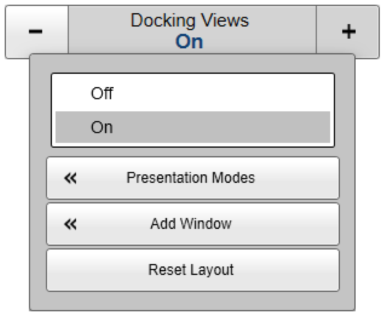
The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. The **Presentation Modes** dialog box allows you to change the order of the tabs at the bottom of the EK80 presentation.

Context

The views are organized in *presentation modes*. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation.

The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

Procedure



1 Open the **Display** menu.

2 Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.

3 Select **Presentation Modes** to open the dialog box.

The **Presentation Modes** box lists the current presentation modes. Each of these appears as a tab on the bottom bar.

4 Select a mode in the list.

5 Select any of the two arrows to position the tab at the bottom of the EK80 presentation.

6 Select **OK** to save the selected setting and close the dialog box.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593
Bottom bar description, page 530
Presentation Modes dialog box, page 591

Creating personalized views by adding a new tab to the bottom of the EK80 presentation

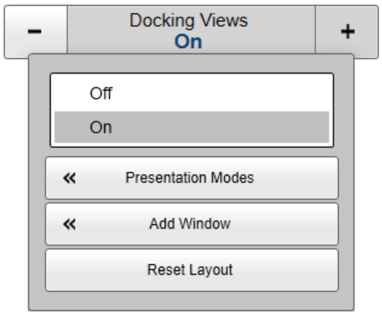
The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.

Context

The views are organized in *presentation modes*. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation.

The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

You can create a new tab to contain the view(s) of your choice.



Procedure

1 Open the **Display** menu.

2 Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.

3 Select **Presentation Modes** to open the dialog box.

The **Presentation Modes** box lists the current presentation modes. Each of these appears as a tab on the bottom bar.

4 In the **Presentation Modes** box, select **New**.

a Type a name for the new mode.

b Select **Add**.

c Select any of the two arrows to position the tab at the bottom of the EK80 presentation.

d Select **OK** to save the selected setting and close the dialog box.

5 At the bottom of the EK80 presentation, select the new tab.

6 Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.

7 Select **Add Window** to open the dialog box.

a Select which channel(s) to place in the new presentation.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

b Select **OK** to save the selected setting and close the dialog box.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593
Bottom bar description, page 530
Presentation Modes dialog box, page 591

Removing personalized presentations

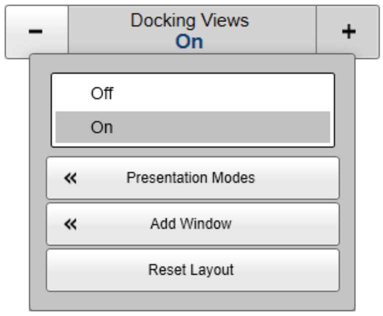
The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. You can delete tab(s) that you do not use. You are not permitted to delete the default system tabs.

Context

The views are organized in *presentation modes*. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation.

The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

Procedure



1 Open the **Display** menu.

2 Observe the **Docking Views** function. Select the middle of the button to open it and access the available options.

3 Select **Presentation Modes** to open the dialog box.

The **Presentation Modes** box lists the current presentation modes. Each of these appears as a tab on the bottom bar.

4 Select a mode in the list.

5 Select **Remove** to delete it.

6 Select **OK** to save the selected setting and close the dialog box.

Related topics

Setting up presentation modes and views, page 238
Docking Views function, page 593
Bottom bar description, page 530
Presentation Modes dialog box, page 591

Defining settings related to user preferences and individual customizing

Topics

Reducing the light emitted from the display presentation

When the bridge is dark, the light emitted by the EK80 display can affect your night vision. In order to compensate for this, you can reduce the intensity

Context

The intensity of the light given off by the EK80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light. The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

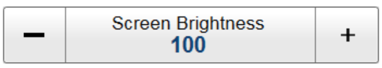
Tip

If you wish to adjust the colour intensity and/or colour scheme of the EK80 presentation, you can also try the **Palette** *function in the* **Colour Setup** *dialog box.*

Procedure

1 Open the **Display** menu.

2 Select a **Screen Brightness** setting that fits your requirements.



To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Screen Brightness function, page 587

Increasing the visibility of the information panes

When you open an information pane, you will see that it is transparent. This transparency allows you to see the echograms data behind the pane, but it may also reduce the visibility of the information in it.

Context

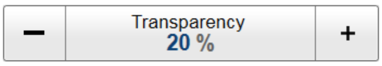
The information panes provided by the EK80 can be placed anywhere on top of the views in the presentation.

In order not to loose information, the panes have been designed so you can see through them. The degree of transparency can be controlled with this **Transparency** function. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.

Procedure

1 Open the **Display** menu.

2 Select a **Transparency** setting that fits your requirements.



To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.If you have a keyboard connected to the EK80, type the requested value.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Colour Scale information pane description, page 464
Depth information pane description, page 465
Bottom Hardness information pane description, page 467
TS (Target Strength) Histogram information pane description, page 469
Target Position information pane description, page 470
TS(f) information pane description, page 472
Biomass information pane description, page 474
Sv(f) information pane description, page 476
Numerical information pane description, page 478
Zoom information pane description, page 486
Transceiver Power Supply information pane description, page 488
Transparency function, page 588

Enabling Coordinated Universal Time (UTC) on the bottom bar

You can set up the EK80 to show Coordinated Universal Time (UTC). When disabled, the EK80 uses local time.

Prerequisites

To enable UTC time, your EK80 Processor Unit must be set up to accept the NMEA ZDA datagram. The NMEA ZDA datagram contains the universal time code (UTC), day, month, year and local time zone.

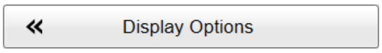
Context

This is an "on/off" switch. The time is shown on the bottom bar of the EK80 presentation.

Procedure

1 Open the **Display** menu.

2 Select **Display Options**.



Observe that the **Display Options** dialog box opens.

3 Select **General** to open the page.

4 Select **UTC Time** to enable Coordinated Universal Time (UTC).

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Display Options dialog box, page 589
General page, page 648
Bottom bar description, page 530

Selecting the information to appear on the top bar

The top bar can contain various information. You can select which elements that will be shown at the top of the EK80 presentation.

Context

The **General** page offers a range of "on/off switches". Some of these "on/off switches" are used to enable or disable the information shown on the top bar.

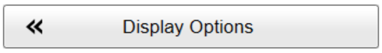
Note

The information shown on the EK80 top bar must not be used for vessel navigation.

Procedure

1 Open the **Display** menu.

2 Select **Display Options**.



Observe that the **Display Options** dialog box opens.

3 Select **General** to open the page.

4 In the **Top Bar** list, select the information you want to see on the top bar.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Display Options dialog box, page 589
General page, page 648
Navigational information, page 455
Depth read-out, page 459

Selecting which tooltips to appear in the user interface

When you move the cursor over the echograms in the EK80 presentation, small "tooltips" are shown to provide additional information. The **Tooltip** page controls which tooltips that are shown.

Context

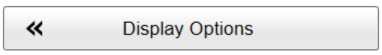
Several tooltips can be shown in the EK80 presentation. When a tooltip is enabled, the cursor location is detected and a small information box is shown. By default, the information is related to the exact position of the cursor. Each tooltip represents a specific piece of information, and they are listed separately.

The **Tooltip** page offers a range of "on/off switches". Each tooltip is presented in the list, and you can enable or disable each of them independently.

Procedure

1 Open the **Display** menu.

2 Select **Display Options**.



Observe that the **Display Options** dialog box opens.

3 Select **Tooltip** to open the page.

4 In the list of tooltips, select the tooltips you want to see.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Display Options dialog box, page 589
Tooltip page, page 651

Changing the colour palette ("skin") used in the EK80 presentations

Depending on the ambient light, it is possible to change the EK80 presentation colours to help you see the information. The **Palette** function allows you to choose which colour theme ("skin") to be used by the EK80.

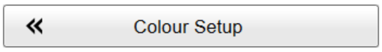
Context

Select a palette to suit the ambient light conditions and your personal preferences. The choice you make does not have any effect on the EK80 performance.

Procedure

1 Open the **Display** menu.

2 Select **Colour Setup**.



Observe that the **Colour Setup** dialog box opens.

3 Select the colour palette ("skin") you want to use.

4 At the bottom of the dialog box, select **Apply** to preview your choice.

5 Select **OK** to save the selected setting and close the dialog box.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Colour Setup dialog box, page 589

Selecting menu language

You may prefer to use the EK80 with a user interface in your own language. The **Language** function allows you to select the language to be used in the EK80 presentations, menus and dialog boxes.

Context

With a few exceptions, the chosen language will also be used for all other text on the EK80. The EK80 help may not be available for the language you choose. If your language is not supported, the English help is provided.

Procedure

1 Open the **Setup** menu.

2 Select the middle of the **Language** button to open the list of available options.

3 Select the language you wish to use.

Result

All the texts in the user interface are changed to the selected language.

The context sensitive on-line help may also be available in your language. To change the language in the on-line help, you may need to restart the EK80.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Language function, page 603

Selecting measurement units

The EK80 is prepared to work with several international standards for units of measurements. From the **Units** page you control which units of measurements that are used.

Context

The EK80 user interface presents many measurements. These measurements are for example related to depth, range and distance. Use the **Units** options to select the units of measurements you want to work with. The EK80 uses them in all presentations. You only need to define them once.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

2 On the left side of the **Installation** dialog box, select **Units**.

Observe that the **Units** page opens.

3 Adjust the setting to fit your requirements.

4 At the bottom of the page, select **Apply** to save your settings.

5 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Defining settings related to user preferences and individual customizing, page 245
Installation dialog box, page 602
Units page, page 699

Saving, retrieving and handling user settings

Topics

Saving the current user settings

When you have spent some time working with the EK80, you are probably using specific settings that you know are efficient for your purpose. It is a good idea to save these settings.

Context

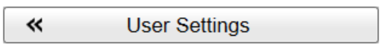
The **User Settings** dialog box is used to store your favourite EK80 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved.

Procedure

1. Observe the **Main** menu.

   Its default location is on the right side of the EK80 presentation.

2. Select **User Settings**.

3. Select **Save Current Setting**.

   A small dialog opens to accept the name of the new setting.

4. Type a name for the user setting.

   Note

   If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** *button to open an on-screen keyboard.*

5. Select **OK** to save the chosen name.

6. Observe that the name you have chosen appears on the **Saved Settings** list.

7 Select **OK** to close the dialog box.

Related topics

Saving, retrieving and handling user settings, page 252
User Settings dialog box, page 561

Choosing previously saved user settings

User settings that either you or any of your colleagues have saved can easily be retrieved and put to use. This shortens down the time it takes to get started with the EK80.

Context

The **User Settings** dialog box is used to store your favourite EK80 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved. To activate either a factory or a saved setting, click the relevant name in one of the lists, then click the **Activate Selected Setting** button.

Procedure

1 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

2 Select **User Settings**.

3 Observe the list of previously saved user settings in the **Saved Settings** list.

4 Select the setting you wish to use.

5 Select **Activate Selected Setting**.

6 Select **OK** to apply your changes and close the **User Settings** dialog box.

Related topics

Saving, retrieving and handling user settings, page 252
User Settings dialog box, page 561

Renaming existing user settings

An existing user setting can easily be renamed.

Context

The **User Settings** dialog box is used to store your favourite EK80 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved. To rename a user setting, select its name in the list, and then select **Rename**. The factory settings can not be renamed.

Procedure

1 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

2 Select **User Settings**.

Observe that the **User Settings** dialog box opens.

3 Observe the list of previously saved user settings in the **Saved Settings** list.

4 Select the setting you wish to rename.

5 Select **Rename**.

A small dialog box opens to accept the new name.

6 Type a name for the user setting.

Note

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** *button to open an on-screen keyboard.*

7 Select **OK** to save the chosen name.

8 Observe that the name you have chosen appears on the **Saved Settings** list.

9 Select **OK** to apply your changes and close the **User Settings** dialog box.

Related topics

Saving, retrieving and handling user settings, page 252
User Settings dialog box, page 561

Deleting user settings that are no longer used

When you save the user settings, the files you have created are shown on the **Saved Settings** list. The list may be too long. User settings that you do not need can be deleted.

Context

The **User Settings** dialog box is used to store your favourite EK80 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved. To delete a user setting, select its name in the list, and then select **Delete**. The factory settings can not be deleted.

Note

There is no "undo".

Procedure

1 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

2 Select **User Settings**.

Observe that the **User Settings** dialog box opens.

3 Observe the list of previously saved user settings in the **Saved Settings** list.

4 Select the setting you wish to delete.

5 Select **Delete**.

A small dialog box opens so that you can verify your choice. There is no "undo".

6 Observe that the name you have chosen is removed from the **Saved Settings** list.

7 Select **OK** to apply your changes and close the **User Settings** dialog box.

Related topics

Saving, retrieving and handling user settings, page 252
User Settings dialog box, page 561

Choosing EK80 factory default settings

Sometimes it may be useful to reset the EK80 to work with a set of known user settings. A set of "factory settings" is provided for this purpose. The settings may be put to use if you are uncertain of which values to use. They offer "best practice" settings for typical use.

Context

The **User Settings** dialog box is used to store your favourite EK80 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved. To activate either a factory or a saved setting, click the relevant name in one of the lists, then click the **Activate Selected Setting** button. The factory settings cannot be altered.

Note

Unless they are saved, all your current settings are lost when the factory settings are applied. There is no "undo".

Procedure

1 Observe the **Main** menu.

Its default location is on the right side of the EK80 presentation.

2 Select **User Settings**.

Observe that the **User Settings** dialog box opens.

3 Observe the **Factory Settings** list.

4 Select the setting you wish to use.

5 Select **Activate Selected Setting**.

6 Select **OK** to apply your changes and close the **User Settings** dialog box.

Related topics

Saving, retrieving and handling user settings, page 252
User Settings dialog box, page 561

Adjusting the transceiver parameters

Topics

Checking and/or editing the transceiver parameters

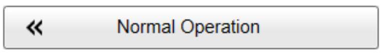
The **Normal Operation** dialog box lists all the transmission parameters. The dialog box provides one row for each channel in use. You can change the parameters.

Prerequisites

This procedure assumes that the EK80 system is turned on and operates normally. The **Normal Operation** dialog box is only available when the EK80 operates in *Normal* mode.

Procedure

1 On the **Operation** menu, open the **Normal Operation** dialog box.



2 For each channel:

a Set **Pulse Type** to a *LFM* or *CW* mode as permitted by your license and the transducer.

b Set **Mode** to *Active*.

c Set **Pulse Duration** to your chosen value.

d Set **Power** to the correct power level for the transducer.

e Set **Start Frequency** and **End Frequency** to values permitted by your license and the transducer.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

3 Close the dialog box.

Related topics

Getting started, page 93
Starting normal operation, page 93
Adjusting the transceiver parameters, page 257
Normal Operation dialog box, page 572
Extras menu, page 554
Processor page, page 713
Transceiver page, page 716

Selecting *Passive* transceiver mode

In *Passive* mode, the EK80 will receive and compute the signals detected by the transducer(s). Therefore, this mode is useful for test purposes, and when you want to measure the ambient background noise in the sea. It can also be useful to run the EK80 in *Passive* mode to discriminate between target echoes (present only in *Active* mode) and noise (present in both *Active* and *Passive* modes).

Context

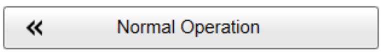
If you wish to investigate the ambient noise, choose *Passive* mode in the **Normal Operation** dialog box. Any noise or disturbance in the water - within the transducer's frequency range - will then be detected and shown. This feature will for example be able to pick up disturbances from other hydroacoustic systems on your own vessel, or on other vessels in the vicinity.

The current setting of this parameter is also shown in the **Extras** menu.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 For the relevant transceiver channel, set **Mode** to *Passive*.

Note

If you set **Mode** *to Passive, your EK80 will no longer provide any information in the echogram(s).*

4 Select **OK** to save the selected setting and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Adjusting the output power

You are permitted to adjust the output power of the EK80. You can not increase the power to beyond the transducer's capacity, but you may reduce it for better performance in shallow water, or if you are struggling with reverberation.

Context

The **Power** parameter in the **Normal Operation** dialog box displays the transmitter's output power measured in Watts. You can change the output power manually. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest. For all practical purposes, this means that you can *reduce* the power output, but you can not increase it to beyond the power rating of the transducer.

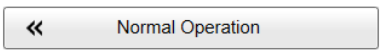
The current setting of this parameter is also shown in the **Extras** menu.

Note

The settings in the **Normal Operation** *dialog box are limited by the specifications in the transducer setup file. Therefore, you cannot make any changes that will damage your transceiver or transducer. Certain settings may be limited by your license. Do not to make any changes unless you are well aware of the consequences.*

Procedure

1. Open the **Operation** menu.
2. Select **Normal Operation**.



3. For the relevant transceiver channel, set **Power** to the requested value.
4. Select **OK** to save the selected setting and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Adjusting the pulse duration

The **Pulse Duration** setting specifies the current duration ("length") of the transmitted pulse. You can manually select a pulse duration that suits your operation.

Context

The pulse duration can be selected according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be selected. Remember that in the EK80, the pulse duration and the bandwidth are mutually dependant.

For CW transmissions:

- Long pulses provides longer detection range. They make the EK80 less sensitive for noise, but offer lower range resolution.
- Short pulses provides shorter detection range. They make the EK80 more sensitive for noise, but offer higher range resolution.

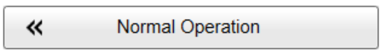
For FM transmissions:

- Long pulses provide longer detection range, and the range resolution is independent of the pulse duration..
- Short pulses provide shorter detection range, and they make the EK80 more sensitive for noise.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 For the relevant channel, set **Pulse Duration** to your chosen value.

4 Select **OK** to save the selected setting and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Defining the frequency sweep (chirp) within each transmission

The EK80 supports wideband transmissions using frequency sweeps. This is often referred to as "chirp", and means that the transmission frequency changes from a "start" frequency to an "end" frequency within the transmission. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Context

The **Start Frequency** and **End Frequency** parameters are used to set up a frequency sweep ("chirp"). If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wide band transmissions. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses.

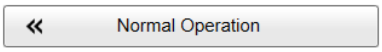
Note

It is very important that the transducer you use complies to the frequencies you choose. The frequency range of each transducer is defined in the transducer setup file. If you choose a frequency range that is not supported, and error message will appear.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 For the relevant channel, set **Start Frequency** and **End Frequency** to values permitted by your transducer.

4 Set **Ramping** to the requested function.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Defining the pulse type for the EK80 transmissions

The **Pulse Type** function allows you to select the "shape" of the transmitted pulses ("pings").

Context

The abbreviation "CW" means "Continuous Wave". "LFM" means "Linear Frequency Modulated".

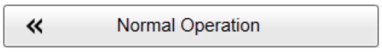
Note

The settings in the **Normal Operation** *dialog box are limited by the specifications in the transducer setup file. Therefore, you cannot make any changes that will damage your transceiver or transducer. Do not to make any changes unless you are well aware of the consequences.*

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 For the relevant channel, set **Pulse Type** to a *LFM* or *CW* mode.

4 Select **OK** to save the selected setting and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Increasing the detection of small targets masked by stronger echoes

It is often difficult to detect small targets that are masked by the echoes from nearby larger objects. A typical example is the detection of fish close to the bottom.

Context

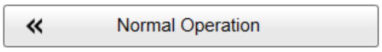
Increasing the detection of smaller targets masked by stronger echoes are generally achieved by reducing the pulse duration. This will increase the resolution, but it will also reduce the maximum detection range because you transmit less amounts of acoustic energy into the water. Your EK80 will also be more sensitive to noise.

For LFM transmissions, a dedicated receive filter setting is available. When set to *High Resolution*, the system applies short-time bandpass filters and the lowest possible decimation. We regard the receive filter as "experimental" and invite you to review the results.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 For LMF transmissions, set **Filter Type** to *High Resolution* for the relevant channel.

This setting will generally result in a shorter impulse response and higher output sample rate. These resulting echo data can be used to address range sidelobe issues from the bandpass filters while examining targets near boundaries. Note that the filter is wider in frequency, and may result in a reduced signal-to-noise ration.

Note

We recommend that you calibrate the EK80 with the **Filter Type** *setting that you will use during the survey.*

---

4 Set **Pulse Duration** to as small value as possible.

Remember that in the EK80, the pulse duration and the bandwidth are mutually dependant.

For CW transmissions:

- Long pulses provides longer detection range. They make the EK80 less sensitive for noise, but offer lower range resolution.
- Short pulses provides shorter detection range. They make the EK80 more sensitive for noise, but offer higher range resolution.

For FM transmissions:

- Long pulses provide longer detection range, and the range resolution is independent of the pulse duration..
- Short pulses provide shorter detection range, and they make the EK80 more sensitive for noise.

5 Select **OK** to save the selected settings and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Switching between ADCP and echo sounder operation

The EC150-3C is a dual purpose unit. It can be used *either* as an acoustic Doppler current profiler (ADCP) instrument to measure water current *or* as a split-beam echo sounder. It can not operate these two functions simultaneously.

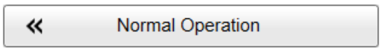
Context

This task is only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 Select operating mode.

- To activate ADCP operation, click the small option button on the left side of the **ADCP** table.
- To activate echo sounder operation, click the small option button on the left side of the **ES** table.

4 Select **OK** to save the selected setting and close the dialog box.

Result

The **Active** menu is changed accordingly.

Related topics

Choosing operating mode and key transmit parameters, page 105
Adjusting the transceiver parameters, page 257
Installing an ADCP transceiver in the user interface, page 308
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Adjusting the specific transceiver parameters for ADCP operation

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements. Some of the settings are specific for ADCP operation.

Context

Each parameter must be defined to match the properties of the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

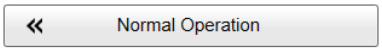
Note

This task is only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 Select the ADCP transceiver channel.

4 Select a suitable value for **Depth Cell Size**

- Use smaller depth cells in shallower waters.
- Use larger depth cells in deeper waters.

5 Select a suitable value for **Max(imum) Current Speed**

Select a value based on the expected water currents in your survey area. If you are uncertain, choose a value *above* the expected water current, and reduce it based on experience. The value you choose must always be equal or larger than the expected value.

6 Select **OK** to save the selected setting and close the dialog box.

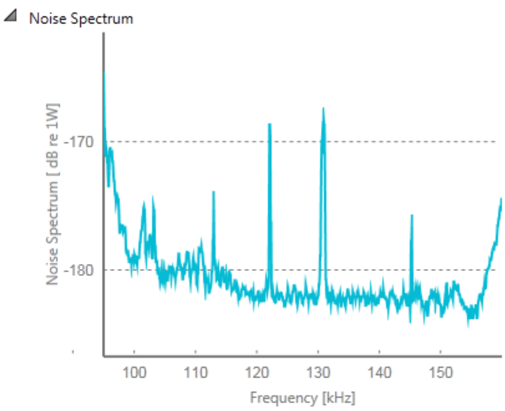
Related topics

Adjusting the transceiver parameters, page 257
Installing an ADCP transceiver in the user interface, page 308
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Measuring the noise in passive mode

You can create as many depth layers as you want on the EK80. Each of the depth layers can be used to measure the background (ambient) noise in the water column.

Context



Layers are used to calculate various values from the echo data collected within a specific depth range in the water column. Echo data may include background noise. The **Noise Spectrum** option displays the current background noise in the echogram view. The noise echoes are not TVG compensated, so they will appear with "true" values on all depths. In most cases, this presentation is only used in passive mode. When activated, a noise spectrum plot is added to the **Layer** list in the *Numerical* information pane. This option is by default "off".

Procedure

1 Click in any echogram view to make it active.

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border.

2 Set **Mode** to *Passive*.

a Open the **Operation** menu.

b Select **Normal Operation**.

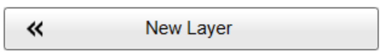
c For the relevant transceiver channel, set **Mode** to *Passive*.

d Select **OK** to save the selected setting and close the dialog box.

3 Create a new layer

a Open the **Active** menu.

b Select **New Layer**.



c Set **Layer Type** to *Pelagic*.

d Define the start depth and the depth range of the layer.

e Select **Noise Spectrum** to activate the function.

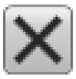
f Select **OK** to save the selected settings and close the dialog box.

4 On the top bar, select **Numerical**.

Observe that the *Numerical* information pane opens. The information from the current "active" layer is shown with red text.

5 At the bottom of the numerical data list, observe the noise spectrum plot.

6 Select **Close** in the top right corner to close the information pane.



Related topics

Adjusting the transceiver parameters, page 257
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716
Numerical information pane description, page 478

Interfacing peripheral equipment

Topics

Installing navigation sensors and other sensors

For the EK80 to use and offer correct navigational information, one or more external sensors must be connected. Typical sensors are those providing navigational information (heading, speed or geographical position). To set up the communication parameters on the serial and LAN ports, use the **I/O Setup** page. To select which sensors to install, use the **Sensor Installation** page. The **Sensor Configuration** page allows you to define a datagram priority, so that the information from the "most reliable" sensor is used by the EK80. You can also define manual values in case a sensor is unserviceable, or not installed.

Prerequisites

The new sensor is physically connected to the EK80 using a serial or network cable.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. However, in order to communicate with each sensor, you must first set up the relevant communication parameters. Once the communication has been established and the sensor is connected, you must define the datagram priority and finalize the configuration.

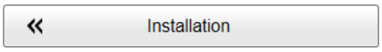
Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Install**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 Set up the interfaces to the navigation sensors.

   a On the left side of the **Installation** dialog box, select **I/O Setup**.

   b Set up the relevant serial or Ethernet (LAN) communication parameters.

   c At the bottom of the page, select **Apply** to save your settings.

   d On the left side of the **Installation** dialog box, select **Sensor Installation**.

   e Select the type of sensor you want to interface, and define the relevant parameters.

   f Select **Add** to save the new sensor interface you have defined.

   g On the left side of the **Installation** dialog box, select **Sensor Configuration**.

   h Define the priority of the datagrams, and set up relevant configuration parameters.

   i At the bottom of the page, select **Apply** to save your settings.

4 Repeat for each sensor interface that you need to set up.

5 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Defining the serial and Ethernet (LAN) port parameters

For any sensor interface to work, the communication parameters must be set up correctly. The EK80 software automatically scans the Processor Unit to locate and identify the available communication ports. Once the software has established a list of valid interfaces, you can set up and control the communication parameters.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The communication parameters required for the sensor interface are known.

Context

The **I/O Setup** page provides two lists; one for serial ports and one for Ethernet (LAN) ports. Each list is supported with a set of functions to set up and monitor the communication ports. Select the port you want to work with and then select one of the buttons below the list.

Tip

The **Sensors** *page in the* **BITE** *(Built-In Test Equipment) dialog box provides an overview of all the communication lines and sensors in use. All relevant status information is provided. You open the* **BITE** *dialog box from the* **Setup** *menu.*

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **I/O Setup**.

4 Observe that the available serial and network interface ports on the Processor Unit are listed.

5 Set up the relevant serial or Ethernet (LAN) communication parameters.

a Select the interface port you wish to set up.

b Select **Setup** below the list to open the **Serial Port Setup** or **LAN Port Setup** dialog box.

c Set up the relevant serial or Ethernet (LAN) communication parameters.

The communication parameters defined for NMEA 0183 are:

- **Baud rate**: 4800 bit/s
- **Data bits**: 8
- **Parity**: Even
- **Stop bits**: 1

Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

d Select **OK** to save the selected settings and close the dialog box.

6 At the bottom of the page, select **Apply** to save your settings.

7 Repeat for any other communication ports that you need to set up.

8 Close the **Installation** dialog box.

Related topics

Interfacing peripheral equipment, page 268

Setting up the input from a navigation system (GPS)

For the EK80 to use and offer correct navigational information, one or more external sensors must be connected. Typical sensors are those providing navigational information (heading, speed or geographical position). To select which sensors to install, use the **Sensor Installation** page. Your current position is shown on the top bar if you have enabled this in the **Display Options** dialog box.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.
- The EK80 system is turned on and operates normally.
- The new sensor is physically connected to the EK80 using a serial or network cable. The sensor is turned on and in normal operation.

Neither tools nor instruments are required.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80. For each relevant sensor you must insert the offset values that define the its physical location relative to the vessel's coordinate system.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

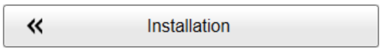
Procedure

1. Connect the navigation system to an available communication port on your Processor Unit.

   This is described in the EK80 *Installation manual*.

2. Open the **Setup** menu.

3. On the **Setup** menu, select **Installation**.

   Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4. On the left side of the **Installation** dialog box, select **Sensor Installation**.

5. For **Type**, select the *GPS* sensor to import information from a global positioning system.

6. Select which port you want to import the sensor information on.

7. If you want to check the communication parameters, select **Inspect Port**.

   Note

   You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page.*

   ---

8. If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

   The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9. Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the sensor.

11 If relevant, specify a dedicated talker ID.

12 Provide the accurate physical location of the sensor (or its antenna) with reference to the vessel's coordinate system.

   The position of certain sensors must be defined as an *offset* to the *Ship Origin* in the coordinate system to maximize performance. These offset values are all required to allow the EK80 to give you as accurate information as possible. The degree of accuracy offered by the EK80 is directly related to the accuracy of the information you enter on the **Sensor Installation** page.

   a Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the sensor is located ahead of the ship origin.

   b Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the sensor is located on the starboard side of the ship origin.

   c Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the sensor is located under the ship origin.

13 Select **Add** to save the new sensor interface you have defined.

   The sensor interface is added to the **Installed Sensors** list on the **Sensor Installation** page.

14 At the bottom of the dialog box, select **Apply** to save your settings.

15 Repeat for each sensor interface that you need to set up.

16 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Further requirements

On the left side of the **Installation** dialog box, select **Sensor Configuration**. Define the priority of the datagrams, and set up relevant configuration parameters.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Configuring the sensor interface

With several sensors connected to the EK80, many of them will provide the same datagrams. We cannot expect that the datagrams provide the same information. The **Sensor Configuration** page allows you to define a datagram priority, so that the information from the "most reliable" sensor is used by the EK80. You can also define manual values in case a sensor is unserviceable, or not installed.

Prerequisites

This procedure assumes that:

- The new sensor is physically connected to the EK80 using a serial or network cable.
- The interface port is set up with the correct communication parameters.
- The navigation sensor is installed into the EK80 software. The relevant interface parameters and physical location properties are defined.

Context

Any information in a datagram, for example the current depth, may be provided in different datagrams from several sensors. Due to a number of reasons (environmental conditions, installation, configuration, accuracy, etc.), the numerical values provided can be different from one sensor to another.

Several sensor are provided on the **Sensor Configuration** page, one for each type of information. Select the sensor you wish to configure in the **Sensor** list. For each type, you can define a priority sensor by rearranging the datagrams in a list. You can also define manual values in case a sensor is unserviceable, or not installed.

The EK80 can communicate with several different sensor types. Use the **Sensor Installation** page to define which external sensors your EK80 will import information from. You must also specify which datagram formats to use.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Sensor Configuration**.

Observe that the **Sensor Configuration** page opens.

4 Select the sensor you wish to configure in the **Sensor** list.

5 If you wish to use the built-in datagram priority, select **Auto**.

- With **Auto** *enabled*, the priority list is used. Information is imported from the sensor at the top of the list. If the sensor fails to provide information for more than 20 seconds, data from the next sensor is used.
- With **Auto** *disabled*, the priority list is not used. Information is imported from the sensor at the top of the list. All other sensors are ignored.

6 If you wish to control the datagram priority manually, *do not* select **Auto**.

To change the priority for a given datagram, select it, and change its location on the list using the arrow buttons.

7 If relevant, add a manual value for the sensor input.

8 At the bottom of the dialog box, select **Apply** to save your settings.

9 Repeat for each sensor interface that you need to set up.

10 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Setting up a serial or LAN (Ethernet) port for annotation input

Several different annotation types may be added to the echograms or other views. They are displayed on the views if this annotation feature is enabled. You can add annotations manually, or import information as datagrams using a serial or LAN (Ethernet) communication port.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area

Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80.

Note

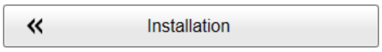
Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Procedure

1 Connect the peripheral system providing the annotations to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Sensor Installation**.

4 Select *Annotations* to import information from the peripheral system.

5 Select the port you wish to use (serial or LAN).

6 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

---

7 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

8 Type a custom name to identify the interface in other dialog boxes.

9 Select which datagram(s) you want to import from the peripheral device.

When you select sensor type Annotation, only one datagram can be selected.

10 Do not specify a dedicated Talker ID.

11 Select **Add** to save the new device interface you have defined.

The device interface is added to the **Installed Sensors** list on the **Sensor Installation** page. It is not necessary to use the **Sensor Configuration** page to set up a priority list.

12 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Connecting a catch monitoring system to a serial or LAN (Ethernet) port

A catch monitoring system can be connected to the EK80. The connection is made using a serial or LAN (Ethernet) port on the Processor Unit. For any sensor interface to work, the communication parameters must be set up correctly.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

The data communication from an external catch monitoring system is based on proprietary data formats. The EK80 supports the following datagram formats from a catch monitoring system.

- **Simrad PSIMP-D**

  Simrad PSIMP-D is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a Simrad catch monitoring system. This datagram format is obsolete, and it is no longer in use on new designs. It has been replaced by datagram PSIMP-D1.

- **Simrad PSIMP-D1**

  Simrad PSIMP-D1 is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS, PI and PX sensors used by a Simrad catch monitoring system. This datagram format replaces the PSIMP-D format.

- **Simrad PSIMP-F**

  Simrad PSIMP-F is a proprietary datagram format created by Kongsberg Maritime to provide the type and configuration of PS and PI sensors used by a Simrad catch monitoring system.

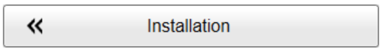
Procedure

1 Connect the peripheral catch monitoring system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Sensor Installation**.

5 Select *PI50* to import information from a catch monitoring system.

6 Select the port you wish to use (serial or LAN).

7 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

8 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9 Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the peripheral device.

When you select sensor type PI50, only one datagram can be selected; PI50 Datagrams. This is a group of datagrams that allows the EK80 to import information from catch monitoring systems.

11 Do not specify a dedicated Talker ID.

12 Select **Add** to save the new system interface you have defined.

The system interface is added to the **Installed Sensors** list on the **Sensor Installation** page. It is not necessary to use the **Sensor Configuration** page to set up a priority list.

13 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Connecting a trawl system to a serial or LAN (Ethernet) port

A trawl system can be connected to the EK80. The connection is made using a serial or LAN (Ethernet) port on the Processor Unit. For any sensor interface to work, the communication parameters must be set up correctly.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

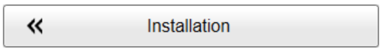
Procedure

1 Connect the peripheral trawl system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Sensor Installation**.

5 Select *ITI-FS* to import information from a trawl system.

6 Select the port you wish to use (serial or LAN).

7 If you want to check the communication parameters, select **Inspect Port**.

Note

You cannot make any changes here. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

---

8 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9 Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the peripheral device.

When you select sensor type ITI-FS, only one datagram can be selected; ITI-FS Datagrams. This is a group of datagrams that allows the EK80 to import information from trawl systems.

11 Do not specify a dedicated Talker ID.

12 Select **Add** to save the new system interface you have defined.

The system interface is added to the **Installed Sensors** list on the **Sensor Installation** page. It is not necessary to use the **Sensor Configuration** page to set up a priority list.

13 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Setting up the input from a motion reference unit (MRU)

The information from a motion reference unit (MRU) (normally heave, roll and pitch information) is imported into the EK80 to increase the accuracy of the echo data.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.
- The EK80 system is turned on and operates normally.
- The new sensor is physically connected to the EK80 using a serial or network cable. The sensor is turned on and in normal operation.

Neither tools nor instruments are required.

Context

A motion reference unit (MRU) measures the vessel's pitch and roll movements in the sea. The information provided by the motion sensor is used by the EK80 to stabilize the beams and the echo presentation.

Note

ADCP operations cannot take place without input from a motion reference unit (MRU). The input must be provided on the KM Binary datagram format. KM Binary is a proprietary datagram format created by Kongsberg Maritime for general use. This format has very high resolution on timing and sensor parameters.

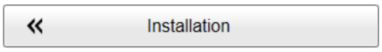
Procedure

1 Connect the motion sensor system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Sensor Installation**.

5 Select the motion reference format you want to use.

6 Select the port you wish to use (serial or LAN).

7 If you want to check the communication parameters, select **Inspect Port**.

Note

*You cannot make any changes here. To change the communication parameters, use the **I/O Setup** page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

8 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9 Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the sensor.

11 If relevant, specify a dedicated talker ID.

12 Provide the accurate physical location of the sensor (or its antenna) with reference to the vessel's coordinate system.

The position of certain sensors must be defined as an *offset* to the *Ship Origin* in the coordinate system to maximize performance. These offset values are all required to allow the EK80 to give you as accurate information as possible. The degree of accuracy offered by the EK80 is directly related to the accuracy of the information you enter on the **Sensor Installation** page.

a Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the sensor is located ahead of the ship origin.

b Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the sensor is located on the starboard side of the ship origin.

c Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the sensor is located under the ship origin.

13 Select **Add** to save the new sensor interface you have defined.

The sensor interface is added to the **Installed Sensors** list on the **Sensor Installation** page.

14 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Setting up the input from a sound speed sensor

If you have a sound speed sensor located close to the transducer face, you can import the information from this sensor. This will result in more accurate EK80 data.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.
- The interface port is set up with the correct communication parameters.
- The EK80 system is turned on and operates normally.
- The new sensor is physically connected to the EK80 using a serial or network cable. The sensor is turned on and in normal operation.

Neither tools nor instruments are required.

Context

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. In the list of valid datagram formats, select the format(s) to be accepted by the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Communication with the sound speed sensor is based on proprietary datagrams.

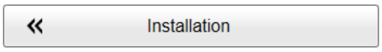
Procedure

1 Connect the sound speed sensor to an available serial communication port on your Processor Unit.

  This is described in the EK80 *Installation manual*.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



  Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Sensor Installation**.

5 For **Type**, select *Sound Speed* to import information from a sound speed sensor.

6 Select which port you want to import the sensor information on.

7 If you want to check the communication parameters, select **Inspect Port**.

  Note

  *You cannot make any changes here. To change the communication parameters, use the **I/O Setup** page.*

8 If you want to check that the peripheral system is transmitting data to the EK80, select **Monitor**.

  The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

9 Type a custom name to identify the interface in other dialog boxes.

10 Select which datagram(s) you want to import from the sensor.

11 If relevant, specify a dedicated talker ID.

12 Select **Add** to save the new sensor interface you have defined.

  The sensor interface is added to the **Installed Sensors** list on the **Sensor Installation** page.

13 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Defining the environmental settings, page 122
Interfacing peripheral equipment, page 268
Profile page, page 658
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694

Setting up depth output to an external system

The EK80 can export depth information on a dedicated communication port (serial or Ethernet) The **Depth Output** page is used to set up the output parameters.

Prerequisites

This procedure assumes that:

- You have a vacant interface port on your Processor Unit.
- You are familiar with NMEA and other relevant datagram formats.
- You know how to set up the parameters for serial and local area network (LAN) communication.

Context

The EK80 can export the depth information on several NMEA datagram formats. You can export several depth formats simultaneously, as each of them is handled independently.

Procedure

1 Connect the peripheral system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Open the **Operation** menu.

3 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Outputs** dialog box, select **I/O Setup**.

Observe that the **I/O Setup** page opens.

5 Observe that the available serial and network interface ports on the Processor Unit are listed.

6 Set up the relevant serial or Ethernet (LAN) communication parameters.

a. On the **I/O Setup** page, select the port you wish to set up.
b. Select **Setup** below the list to open the **Serial Port Setup** or **LAN Port Setup** dialog box.
c. Set up the relevant communication parameters.

7. On the left side of the **Output** dialog box, select **Depth Output**.

   Observe that the **Depth Output** page opens.

8. Select **Processed Data to Output** to open the page.

   a. Select which depth datagram to export.
   b. Select the communication port you want to use.
   c. Choose which channel to use as source for the depth information.

      "Best practice" is to use the lowest frequency. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

   d. Select **Add** to start export of the chosen data format.

      Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page.

9. If you want to check the communication parameters, select **Inspect Port**.

   Note

   *You cannot make any changes here. To change the communication parameters, use the **I/O Setup** page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

10. If you want to check the data flow on the selected port, select **Monitor**.

    Make sure that there is data traffic on the output port (shown in the **Tx Data** box).

    The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

11. Select **Apply** and then **Close** to save all the parameters and close the **Output** dialog box.

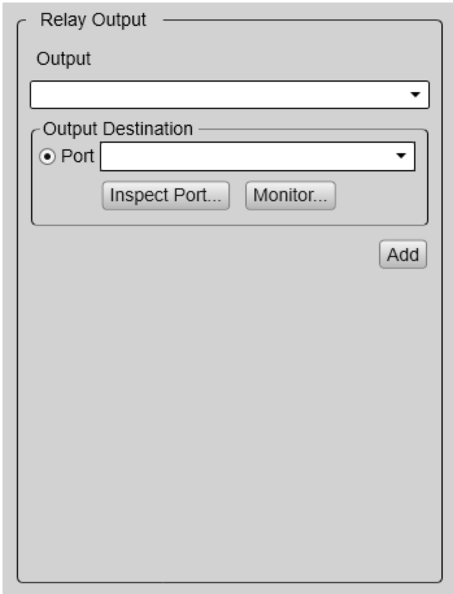
Related topics

Recording and exporting processed echo data, page 137
Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Processed Data to Output page, page 640

Exporting sensor data to a peripheral system

The information provided to the EK80 from various sensors can also be useful for other systems on board. The EK80 allows you to export the same sensor data that was originally imported. This can "reuse" the same information on other systems. The **Relay Output** page is used to set up and control this export functionality.

Context



The information imported to the EK80 from various sensors can also be useful for other systems on board your vessel. The EK80 allows you to "re-export" this sensor information. When activated, the selected sensor information is sent out on the chosen communication port (serial or LAN) on the Processor Unit.

The following sensor data can be exported:

- Navigation
- Motion sensor

Procedure

1. Connect the peripheral system to an available communication port on your Processor Unit.

   This is described in the EK80 *Installation manual*.
2. Open the **Operation** menu.
3. Select **Output**.

   Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.
4. On the left side of the dialog box, select **I/O Setup**.
5. Observe that the available serial and network interface ports on the Processor Unit are listed.
6. Set up the relevant serial or Ethernet (LAN) communication parameters.
   a. On the **I/O Setup** page, select the port you wish to set up.
   b. Select **Setup** below the list to open the **Serial Port Setup** or **LAN Port Setup** dialog box.
   c. Set up the relevant communication parameters.
   d. Select **Apply** to save your choices.

7 On the left side of the **Output** dialog box, select **Relay Output**.

8 On the **Relay Output** page, set up the data export parameters.

   a Select which information to export.

   b Select the communication port you want to use.

   c Select **Add** to start export of the chosen data format.

9 If you want to check the communication parameters, select **Inspect Port**.

   Note

   *You cannot make any changes here. To change the communication parameters, use the **I/O Setup** page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

10 If you want to check the data flow on the selected port, select **Monitor**.

   In order to see this data traffic, your EK80 must be active and transmitting information to the peripheral system.

   The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams. The **Port Monitor** dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.

11 Select **Apply** and then **Close** to save all the parameters and close the **Output** dialog box.

Related topics

Recording and exporting processed echo data, page 137
Interfacing peripheral equipment, page 268
I/O Setup page, page 636
Relay Output page, page 645

Synchronizing the EK80 by means of a serial port

If you want to use the EK80 as a master or slave in a synchronized system, you must set it up for such operation. To do this, you must select which communication port to use for the synchronization interface, and you must select the requested synchronization mode.

Prerequisites

This procedure assumes that:

- The vessel is berthed or at sea.
- You have an RS2-232 interface port on your Processor Unit that allows you to use the CTS/RTS connections.

For "slave" operation, a remote system (for example *K-Sync*) must be available to provide trigger pulses. For "master" operation, a remote hydroacoustic system (sonar, echo sounder) is connected. This remote system must be set up in "slave" mode.

Context

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

The EK80 offers functionality for remote transmit synchronization. It can be set up to operate in either *Master* or *Slave* mode.

Note

The Wide Band Transceiver (WBT) offers an AUXILIARY *port that can be used for synchronisation purposes. This synchronization method may be more stable that the traditional CTS/RTS connection to a serial port.*

The **Synchronization Delay** *functionality is unavailable if you use the* AUXILIARY *port on your Wide Band Transceiver (WBT) to synchronize the EK80.*

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Procedure

1 Connect the synchronization cable from the remote system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

2 Turn on the EK80, and set it to normal use.

3 Open the **Setup** menu.

4 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

5 On the left side of the **Installation** dialog box, select **Synchronization**.

6 Select **Synchronization Mode**.

- *Stand-alone*

  Synchronization is turned off.This synchronization mode is used if the EK80 is working by itself and with no synchronization required. This is the default setting. The EK80 operates using its internal ping interval parameters, independent of any trigger signals arriving at the synchronization port.

The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  Master mode is used if the EK80 is going to act as the controlling unit in a synchronized system. The peripheral hydroacoustic system(s) are only permitted to transmit when enabled by the EK80. When *Master* mode is selected, the EK80 will run using its internal ping interval parameters and send trigger signals to the peripheral system(s).

  This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

- *Slave*

  Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

7 Select **Synchronization Delay**.

This delay parameter is used differently depending on the chosen synchronization mode.

- *Stand-alone*

  The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  In *Master* mode, the EK80 waits for the delay time after the external trigger signal has been sent to the slaves before transmitting the ping. This is often referred to as a *pre-trigger*.

  Note

  This delay will only work when the synchronization is set up using a serial port.

- *Slave*

  In *Slave* mode, the EK80 waits for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as a *post-trigger*.

8 From the list of ports available, select **Synchronization Port**.

This is the interface port currently used to transmit or receive synchronization signals. It must be an RS-232 serial port. Since the synchronization function only uses the *Request To Send (RTS)* and *Clear To Send (CTS)* signals on a serial port, you can use a port that is already used for other purposes. For the same reason, you do not need to define any baud rate.

9 At the bottom of the page, select **Apply** to save your settings.

10 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Interfacing peripheral equipment, page 268
Setting up the EK80 in a synchronized system, page 318
Setting up depth output to an external system, page 285

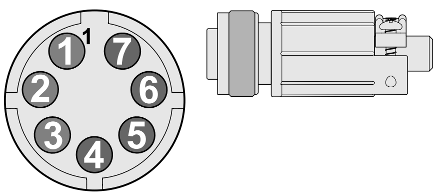
Synchronizing the EK80 by means of the Auxiliary port

The Wide Band Transceiver (WBT) offers an AUXILIARY port that can be used for synchronisation purposes. This synchronization method may be more stable that the traditional CTS/RTS connection to a serial port.

Prerequisites

An external synchronisation system is connected to the AUXILIARY socket on the Wide Band Transceiver (WBT).

Context



The AUXILIARY socket on the Wide Band Transceiver (WBT) can be used to interface an external synchronization system.

The socket fits a Conxall 7-pin Mini-Con-X® shielded plug. The connections are made on pins 2, 3 and 5. The plug can be ordered from the manufacturer or purchased from Kongsberg Maritime. Use part number 387563.

- **Manufacturer**: Switchcraft Conxall
- **Manufacturer's website**: http://www.conxall.com

Pin number	**1**	**2**	**3**	**4**
Signal	Future use	Synchronization Output	Synchronization Input	Future use
Pin number	**5**	**6**	**7**	
Signal	Digital ground	Not used	Not used	

The parameters on the **Synchronization** page allow you to choose which communication port to use for the physical connection to the external system, and which synchronization mode to use. The **Synchronization** page is located in the **Installation** dialog box on the **Setup** menu.

Note

If you use more than one Wide Band Transceiver (WBT) in your EK80 system, all synchronization input signals to the AUXILIARY *ports must be provided by the same source. Individual synchronization of a single Wide Band Transceiver (WBT) is not supported.*

If you use more than one computer in your EK80 system, the synchronization inputs to the AUXILIARY *ports can not be used. This functionality is not supported.*

The **Synchronization Delay** *functionality is unavailable if you use the* AUXILIARY *port on your Wide Band Transceiver (WBT) to synchronize the EK80.*

Procedure

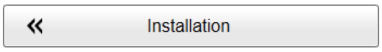
1 Connect the dedicated cable from the Wide Band Transceiver (WBT) to the external synchronisation system.

   This is described in the EK80 *Installation manual*.

2 Turn on the EK80, and set it to normal use.

3 Open the **Setup** menu.

4 On the **Setup** menu, select **Installation**.



   Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

5 On the left side of the **Installation** dialog box, select **Synchronization**.

6 From the list of ports available, select **Transceiver Auxiliary Port**.

7 Observe that when **Transceiver Auxiliary Port** is selected, only *Slave* synchronization mode is permitted.

   Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

8 At the bottom of the page, select **Apply** to save your settings.

9 Continue your work in the **Installation** dialog box, or select **OK** to close it.

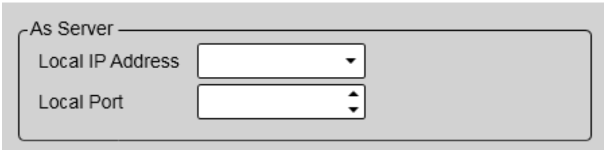
Related topics

Interfacing peripheral equipment, page 268
Setting up the EK80 in a synchronized system, page 318
Setting up depth output to an external system, page 285

Setting up the interface between the EK80 and the Simrad TD50

The EK80 can be set up to communicate with the Simrad TD50 3D Visualization Software. In this context, the EK80 is regarded as the "source system". The interface between the EK80 and the TD50 computer uses a high-speed Ethernet connection. The relevant IP addresses must be defined on both computers.

Prerequisites



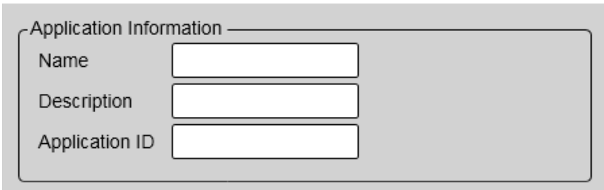
It is assumed that you are familiar with the Windows® operating systems, computer technology, and interface principles.

The Ethernet adapter in the EK80 Processor Unit is set up with the correct IP addresses.

Context

All the steps in this procedure are done in the EK80 user interface.

Procedure



1. Open the **Setup** menu.
2. On the **Setup** menu, select **Installation**.
3. On the left side of the **Installation** dialog box, select **Remote Control** and then **As Server** to open the page.
   a. Select the **Local IP Address**.

      This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit.

   b. Keep the present value in **Local Port**.
4. Select **Remote Control**, then **Application Information** to open the page.
5. Provide relevant application information.
6. At the bottom of the page, select **Apply** to save your settings.
7. Select **OK** to close the dialog box.

Related topics

Interfacing peripheral equipment, page 268

Installing transducers and transceiver channels in the user interface

Topics

Defining the IP address on the Processor Unit network adapter for communication with the transceiver

The Processor Unit and the transceiver(s) communicate on a high capacity Ethernet cable. If more than one transceiver is used, an Ethernet switch is added. On the Processor Unit, define the IP address and Subnet mask for the Ethernet port used to communicate with the transceiver(s). EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

Prerequisites

This procedure is made for the Microsoft® Windows® 10 operating system. It is assumed that you are familiar with this operating system.

Context

As long as you do not replace the Processor Unit or the network adapter in the Processor Unit, you only need to do this once.

Procedure

1 On the Processor Unit, close the EK80 program.

2 Open the **Network Connections** dialog box.

   a In the bottom-left corner of your desktop, select the Windows® search function.

   b In the search box, type "Network Connections", and open the **Network Connections** dialog box.

3 Right-click the network adapter you are going to use and select **Properties** on the shortcut menu.

4 On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.

5 Select **Use the following IP address**, and type the IP address and network mask.

- **IP Address**: 157.237.15.12

  Any address can be used, but 157.237.15.12 is recommended for legacy reasons. This is particularly important if your system contains old GPT transceivers.

- **Subnet mask**: 255.255.255.0

  You can leave **Subnet mask** blank and select **OK**. When you see an error message saying that the message subnet mask is missing, select **OK** again. A default subnet mask is then automatically generated.

6 Select **OK** to save the selected settings, and then close all the dialog boxes.

7 Start the EK80 program.

8 Open the **Transceiver Installation** page.

  a Open the **Setup** menu.

  b On the **Setup** menu, select **Installation**.

  c On the left side of the **Installation** dialog box, select **Transceiver**.

9 Under **Transceiver Browsing** insert the IP Address that you just specified for the Ethernet adapter.

10 At the bottom of the page, select **Apply** to save your settings.

11 Turn each transceiver off and on.

This forces the EK80 to assign new IP addresses within the selected IP range.

Related topics

Installing and maintaining software, page 329

Installing one or more transducers

The transducers you wish to use with the EK80 must be "installed" as a part of the software configuration. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these. Unless you replace a broken transducer, or add a new, you only need to do this once.

Prerequisites

It is assumed that the EK80 software has been installed, and that all relevant license strings have been applied. You need to know the type and serial number of each transducer that you wish to install.

Context

Each transducer is added using the **Transducer Installation** page. The **Transducer Installation** page is located in the **Installation** dialog box.

You can only choose a transducer from the **Model** list. The list is generated from a system file on your Processor Unit. It contains all the transducers that are compatible with the transceiver(s) you have. The list also includes technical specifications for each transducer. You can not see this information, but it is used by the EK80 to set up the operational parameters. This allows each transceiver to optimise its performance for the individual transducer models.

If you cannot find your transducer in the list, contact you dealer, agent or Kongsberg Maritime to upgrade the relevant software component in the EK80.

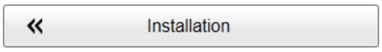
Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transducer Installation**.

4 Select the transducer you wish to install from the **Model** list.

Note

Make sure that you select a transducer that is supported by your current license.

---

5 Insert the serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 is calibrated. Some new Simrad transducers with built-in "intelligence" will automatically provide this serial number.

6 Type the name you wish to use into the **Custom Name** box.

Type any name that you wish to use to identify the transducer. The name you select will only be used to identify the transducer in other dialog boxes. It is not used in the echo data that you export. If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

7 Select mounting method.

8 Specify the orientation of the transducer beam.

9 If relevant for your transducer installation, provide the accurate physical location of the transducer with reference to the vessel’s coordinate system.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

Use the centre of the transducer face as reference, and define the offset values related to the *Ship Origin*.

a Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the transducer is located ahead of the ship origin.

b Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the transducer is located on the starboard side of the ship origin.

c Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the transducer is located under the ship origin.

10 If relevant for your transducer installation, provide the rotation angles.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

---

a Obtain the rotation (angle) information from the personnel that installed the transducer.

b Insert the values.

- Specify an angle (in degrees) to compensate for any deviation from the X axis (fore-and-aft direction) in the coordinate system.
- Specify an angle (in degrees) to compensate for any deviation from the y-axis (athwartship direction) in the coordinate system.
- Specify an angle (in degrees) to compensate for any deviation from the Z axis (vertical direction) in the coordinate system.

Keep in mind that in its default position (all axis set to 0 (zero)) the transducer points straight down with the orientation mark (arrow) pointing forward. This default position must always be used as reference for rotation adjustments. To set the angles correctly, observe this exercise.

1 Start with the transducer in its default position: The transducer face is horizontal facing down, and the indicator arrow is pointing straight forward.

2 If the transducer is properly installed without unintentional skew, the **Rotation around X** can also be set to 0 (zero).

3 Lift the front end of the transducer up, so that the indicator arrow moves up. This is a **Rotation around Y**.

4 Proceed until the requested angle has been reached.

Example: If a 30-degree Y angle is requested, the **Rotation around Y** must be set to 60 degrees (that is the angle from the default position). Since the transducer is pointing straight forward, the **Rotation around Z** value is 0 (zero).

5 From this raised position, turn the transducer towards starboard. The indicator arrow is still pointing up. This is a **Rotation around Z**.

6 Proceed until the requested angle has been reached.

Example: If a 90-degree Z angle is requested, the **Rotation around Z** must be set to 90 degrees (that is the angle from the forward position).

11 Select **Add** to save the information you have provided.

The transducer is added to the list in the **Installed Transducers** box.

12 Repeat for each transducer that you wish to install.

13 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

Once a transducer has been installed, it is listed in the **Installed Transducers** box. To see the information you have collected about the transducer, select the relevant transducer in the list.

The **Edit** functionality on the **Transducer Installation** page makes it possible to change the information you have provided for the transducer. You cannot change the model identification and the serial number. The custom name is used several places in the user interface, and it can be changed.

The **Remove** functionality on the **Transducer Installation** page makes it possible to delete the information you have provided for the transducer. There is no "undo" functionality.

Further requirements

In some EK80 applications, one or more transducers are installed facing upwards. In order to adjust the echogram presentations to this use, the **Beam Direction** function is introduced. Unlike the presentation on a traditional fish finding echo sounder, you can select *Upwards* mode. The presentation is then adjusted for a transducer located at the bottom of the echogram looking up towards the sea surface.

Related topics

Installing transducers and transceiver channels in the user interface, page 294

Installing towed body transducers

The transducers you wish to use with the EK80 must be "installed" as a part of the software configuration. Transducer(s) mounted in a towed body are supported. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these.

Prerequisites

It is assumed that the EK80 software has been installed, and that all relevant license strings have been applied. You need to know the type and serial number of each transducer that you wish to install.

The towed body must include a suitable depth sensor providing the current depth in an NMEA DPT datagram. In this datagram, the second depth value (offset, in meters) must contain the towed body depth. The sensor is connected to a communication port on the Processor Unit.

Context

Each transducer is added using the **Transducer Installation** page. The **Transducer Installation** page is located in the **Installation** dialog box.

You can only choose a transducer from the **Model** list. The list is generated from a system file on your Processor Unit. It contains all the transducers that are compatible with the transceiver(s) you have. The list also includes technical specifications for each transducer. You can not see this information, but it is used by the EK80 to set up the operational parameters. This allows each transceiver to optimise its performance for the individual transducer models.

If you cannot find your transducer in the list, contact you dealer, agent or Kongsberg Maritime to upgrade the relevant software component in the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transducer Installation**.

4 Select the transducer you wish to install from the **Model** list.

Note

Make sure that you select a transducer that is supported by your current license.

5 Insert the serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 is calibrated. Some new Simrad transducers with built-in "intelligence" will automatically provide this serial number.

6 Type the name you wish to use into the **Custom Name** box.

Type any name that you wish to use to identify the transducer. The name you select will only be used to identify the transducer in other dialog boxes. It is not used in the echo data that you export. If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

7 Set **Mounting** to *Towed*.

8 Set **Orientation** to *Vertical*.

9 Set the vertical installation offset (Z Offset) to the distance between the transducer and the depth sensor in the towed body.

10 Select **Add** to save the information you have provided.

The transducer is added to the list in the **Installed Transducers** box.

11 Repeat for each transducer that you wish to install.

12 Set up the interface to the depth sensor in the towed body.

a On the left side of the **Installation** dialog box, select **I/O Setup**.

b Set up the relevant serial or Ethernet (LAN) communication parameters.

c At the bottom of the page, select **Apply** to save your settings.

d On the left side of the **Installation** dialog box, select **Sensor Installation**.

e Select sensor type *External Depth*.

f Set up the relevant parameters, and select datagram *DPT*.

g Select **Add** to save the new sensor interface you have defined.

h On the left side of the **Installation** dialog box, select **Sensor Configuration**.

i Define the priority of the datagrams, and set up relevant configuration parameters.

j At the bottom of the page, select **Apply** to save your settings.

13 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

Once a transducer has been installed, it is listed in the **Installed Transducers** box. To see the information you have collected about the transducer, select the relevant transducer in the list.

The **Edit** functionality on the **Transducer Installation** page makes it possible to change the information you have provided for the transducer. You cannot change the model identification and the serial number. The custom name is used several places in the user interface, and it can be changed.

The **Remove** functionality on the **Transducer Installation** page makes it possible to delete the information you have provided for the transducer. There is no "undo" functionality.

Related topics

Installing transducers and transceiver channels in the user interface, page 294

Installing transceiver channels

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. All units are turned on.

- All cables are connected and tested.
- The software license for each transceiver is installed and activated.
- The Ethernet adapter in the Processor Unit is set up with a unique IP address.
- All relevant transducers are installed using the **Transducer Installation** page.

Context

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers.

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.

- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.
- **Available**: This channel is vacant and ready for use.

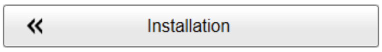
Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transceiver**.

4 Install the channels(s).

a Observe that the transceiver(s) you have connected to the Processor Unit are listed.

Each transceiver is identified with type and serial number. The available channels on each transceiver are listed separately.

Tip

If no transceivers are listed:

1 Select **Browse** *in the* **Transceiver Browsing** *box, and open the* **Local IP Address** *box.*

2 Select the correct address for the Ethernet adapter you are using.

Select **Apply**.

This will make the EK80 search the network for available transceivers.

3 Check that each transceiver has been turned on.

4 Verify that the Ethernet communication between the units is operational.

5 If you are using an Ethernet switch, make sure that it works.

6 If you have changed the network settings, turn each transceiver off and on.

EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

b For each channel, choose which transducer to connect to.

The list of transducers available for installation is defined by those you installed on the **Transducer** page.

Note

This is a critical task. Make sure that the correct transducer is selected.

c Observe that the status for the relevant frequency channels change to *Installed*.

5 At the bottom of the page, select **Apply** to save your settings.

6 Repeat until all the channels have been installed.

7 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

When all channels have been installed, you can start normal operation.

Related topics

Installing transducers and transceiver channels in the user interface, page 294

Installing multiplexed transceiver channels

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. Certain transceivers for the EK80 support multiplexed outputs.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. All units are turned on.

- All cables are connected and tested.
- The software license for each transceiver is installed and activated.
- The Ethernet adapter in the Processor Unit is set up with a unique IP address.
- All relevant transducers are installed using the **Transducer Installation** page.

Context

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers.

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.
- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.
- **Available**: This channel is vacant and ready for use.

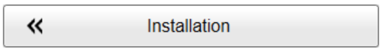
Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this* before *you continue working on a different page.*

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transceiver**.

4 Install the channels(s).

a Observe that the transceiver(s) you have connected to the Processor Unit are listed.

Each transceiver is identified with type and serial number. The available channels on each transceiver are listed separately. When applicable, a tick box appears in the channel list to enable the multiplexing functionality. Make sure that you have a clear understanding of which transducer that is connected to which output on the transceiver.

Tip

If no transceivers are listed:

1. *Select* **Browse** *in the* **Transceiver Browsing** *box, and open the* **Local IP Address** *box.*
2. *Select the correct address for the Ethernet adapter you are using.*

   Select **Apply**.

   This will make the EK80 search the network for available transceivers.
3. *Check that each transceiver has been turned on.*
4. *Verify that the Ethernet communication between the units is operational.*
5. *If you are using an Ethernet switch, make sure that it works.*
6. *If you have changed the network settings, turn each transceiver off and on.*

   EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

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b. Select the tick box to expand the channel listing to include the additional channels, transducer names and transducer models.

c. For each channel, choose which transducer to connect to.

   The list of transducers available for installation is defined by those you installed on the **Transducer** page.

   Note

   This is a critical task. Make sure that the correct transducer is selected.

   ---

d. Observe that the status for the relevant frequency channels change to *Installed*.

5. At the bottom of the page, select **Apply** to save your settings.
6. Repeat until all the channels have been installed.
7. Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

When all channels have been installed, you can start normal operation.

Related topics

Installing transducers and transceiver channels in the user interface, page 294

Disconnecting transceiver channels

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. A transceiver channel can be disconnected from the EK80 Processor Unit. This is typically useful if the transceiver is meant to be used by another Processor Unit on another echo sounder system. It is also useful if you have a large number of channels and want to reduce the number of echogram views in your presentation.

Context

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers.

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.
- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.
- **Available**: This channel is vacant and ready for use.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transceiver**.

4 Disconnect the requested frequency channels(s).

a Observe that the transceiver(s) you have connected to the Processor Unit are listed.

Each transceiver is identified with type and serial number. The available channels on each transceiver are listed separately.

b Write down which transducers you are using on each channel.

c For each channel you want to disconnect, set transducer to *None*.

d Observe that the status of the relevant frequency channels changes to *Available*.

5 At the bottom of the page, select **Apply** to save your settings.

6 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Result

You cannot use the disconnected channels. If you want to use them again, each must be reinstalled.

Related topics

Installing transducers and transceiver channels in the user interface, page 294

Installing an ADCP transceiver in the user interface

These tasks are only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Note

The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Topics

Summary of procedures

Before the ADCP transceiver can be put to use it must be installed in the EK80 user interface.

Prerequisites

A compatible motion sensor is installed. ADCP operations cannot take place without input from a motion reference unit (MRU). The EK80 has been designed to match the motion reference unit (MRU) sensors manufactured by Kongsberg Seatex. Descriptions of all available types are provided on their website.

A software license is available.

The EK80 system is turned on and operates normally.

Caution

You must never set the EK80 to "ping" unless the transducer is submerged in water. The transducer may be damaged if it transmits in open air.

Context

If you use more than one transceiver, a high capacity Ethernet switch is required. Unless specifically listed in a contract or purchase order, the Ethernet switch is not a part of the EK80 scope of supply. Kongsberg Maritime may provide a suitable Ethernet switch.

Procedure

1 Install the software license.

The **Software License** settings allow you to type a license code (text string) to unlock the functionality in the ADCP transceiver. The **Software License** page is located in the **Installation** dialog box.

Obtaining and installing the software license for EC150-3C, page 310

2 Make sure that a compatible motion reference unit (MRU) is connected to the EK80.

Note

ADCP operations cannot take place without input from a motion reference unit (MRU). The input must be provided on the KM Binary datagram format. KM Binary is a proprietary datagram format created by Kongsberg Maritime for general use. This format has very high resolution on timing and sensor parameters.

Interfacing peripheral equipment, page 268

3 Define the IP address on the EK80 Processor Unit network adaptor for communication with the ADCP transceiver.

Defining the IP address on the Processor Unit network adapter for communication with the EC150-3C, page 312

4 Install the ADCP transceiver as a transceiver channel in the EK80 user interface.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. The **Transceiver Installation** parameters control the installation and disconnection of transceivers. The **Transceiver Installation** page is located in the **Installation** dialog box.

Installing an ADCP transceiver as a transceiver channel, page 313

5 Install the ADCP transceiver as a transducer in the EK80 user interface.

The transducer is added using the **Transducer Installation** page. The **Transducer Installation** page is located in the **Installation** dialog box. If your EK80 shall only be used with an ADCP transceiver for current profiling, you do not need to install other transducers.

Defining the EC150-3C installation parameters, page 315

6 In the **Normal Operation** dialog box, set the operating parameters.

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements.

Adjusting the transceiver parameters, page 257

Related topics

Installing an ADCP transceiver in the user interface, page 308

Obtaining and installing the software license for EC150-3C

To operate the EK80 with an ADCP transceiver you need a valid software license. Before you can use the EK80 you must obtain a "license string" and install it on your Processor Unit. Without a license you will not be able to communicate with the transceiver.

Prerequisites

This procedure assumes that the EK80 operating software has been successfully installed on the Processor Unit.

Context

The software license is a 32 character hexadecimal string based on the transceiver's serial number. It defines several key parameters that control the functionality and behaviour of the transceiver(s) you use. Each software license code "unlocks" one transceiver for operational use with a set of predefined properties.

The software license is not linked to the physical Processor Unit. You can therefore easily move the software from one computer to another, just remember to make a copy of the license string.

Note

Once you receive your software license string(s), do not lose them. We suggest that you copy the information into a text file (for example Notepad), and add relevant information. Place the text file on the Processor Unit desktop, and make sure that backup copies are made.

In order to obtain a software license you must contact a Simrad dealer or distributor. You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

Note

This information is only valid if your EK80 is meant to operate with an EC150-3C transducer.

Procedure

1. Obtain the necessary information about your transceiver(s) and transducer(s). Write down:
   a. The serial number for each transceiver.
   b. The beam type.
   c. Which transducers you have connected to each transceiver.
2. Send the necessary information to one of Simrad's dealers or distributors.

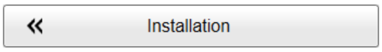
   You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

   You can use the following e-mail address:

   - purchase.order@simrad.com

Once the software license string(s) have been returned to you (most likely by e-mail), you can install the licenses into the software.

3. On the **Setup** menu, select **Installation**.

   Observe that the **Installation** menu opens. This dialog box contains a number of pages selected from the menu on the left side.
4. On the left side of the **Installation** dialog box, select **Software License**.

   Observe that the **Software License** page opens.
5. Select **Type License String**, and type the license string into the dialog box.

   If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard. If you have received the license string on an electronic format (e-mail or text file), you can copy the string from the source document and paste it into the **Type License String** dialog box.
6. Select **OK** to save the license string and close the **Type License String** dialog box.
7. Verify that the license string is placed in the **Currently active licenses** list.

   If necessary, select the license string on the left side, and click the arrow button [>] to move it to the **Currently active licenses** list.
8. Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Installing an ADCP transceiver in the user interface, page 308

Defining the IP address on the Processor Unit network adapter for communication with the EC150-3C

The communication between the Processor Unit and the transceiver(s)/transducer(s) is made using a high capacity Ethernet cable. If more than one transceiver or transducers are used, an Ethernet switch is added. On the EK80, the necessary IP address is generated automatically. However, we recommend that you manually define which IP Address and Subnet mask the Ethernet adapter in the Processor Unit shall use for this communication.

Prerequisites

This procedure is made for the Microsoft® Windows® 10 operating system. It is assumed that you are familiar with this operating system.

Context

As long as you do not change the Processor Unit to another computer, or replace the network adapter in your Processor Unit, you will only need to do this once.

Procedure

1 On the Processor Unit, close the EK80 program.

2 Open the **Network Connections** dialog box.

   a In the bottom-left corner of your desktop, select the Windows® search function.

   b In the search box, type "Network Connections", and open the **Network Connections** dialog box.

3 Right-click the network adapter you are going to use and select **Properties** on the shortcut menu.

4 On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.

5 Select **Use the following IP address**, and type the IP address and network mask.

   - **IP Address**: 157.237.15.12

     Any address can be used, but 157.237.15.12 is recommended for legacy reasons. This is particularly important if your system contains old GPT transceivers.

   - **Subnet mask**: 255.255.255.0

     You can leave **Subnet mask** blank and select **OK**. When you see an error message saying that the message subnet mask is missing, select **OK** again. A default subnet mask is then automatically generated.

6 Select **OK** to save the selected settings, and then close all the dialog boxes.

7 Start the EK80 program.

8 Open the **Transceiver Installation** page.

   a Open the **Setup** menu.

   b On the **Setup** menu, select **Installation**.

   c On the left side of the **Installation** dialog box, select **Transceiver**.

9 Under **Transceiver Browsing** insert the IP Address that you just specified for the Ethernet adapter.

10 At the bottom of the page, select **Apply** to save your settings.

11 Turn each transceiver off and on.

This forces the EK80 to assign new IP addresses within the selected IP range.

Further requirements

If you later need to change the IP address, always recycle the power to the EK80 before you start the EK80.

Related topics

Installing an ADCP transceiver in the user interface, page 308

Installing an ADCP transceiver as a transceiver channel

In order to use the ADCP transceiver, it must be connected to the EK80 Processor Unit with a high capacity Ethernet cable, and defined as a transceiver channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Prerequisites

This procedure assumes that the EK80 operating software has been successfully installed on the Processor Unit. The EC150-3C is installed according to the relevant installation instructions, and connected to the EK80 Processor Unit with a high capacity Ethernet cable.

- All cables are connected and tested.
- The Ethernet adapter in the Processor Unit is set up with a unique IP address.

Context

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers.

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.
- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.

- **Available**: This channel is vacant and ready for use.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Procedure

1 On the Processor Unit, close the EK80 program.

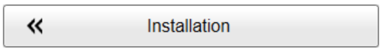
2 Turn on the EC150-3C Power Supply Unit to activate the transducer.

3 Wait one minute.

4 Start the EK80 program.

5 Open the **Setup** menu.

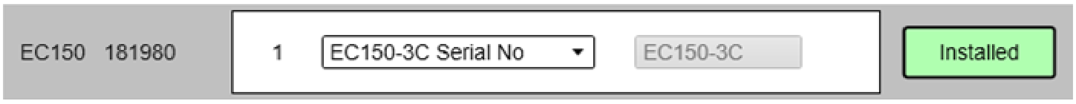
6 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

7 On the left side of the **Installation** dialog box, select **Transceiver**.

8 Make sure that the ADCP transceiver is automatically detected, and that it is available for use.



Tip

If no transceivers are listed:

- *Select* **Browse** *in the* **Transceiver Browsing** *box, and open the* **Local IP Address** *box.*
- *Select the correct address for the Ethernet adapter you are using.*

  This will make the EK80 search the network for available transceivers.
- *Check that each transceiver has been turned on.*
- *Verify that the Ethernet communication between the units is operational.*
- *If you are using an Ethernet switch, make sure that it works.*

9 At the bottom of the page, select **Apply** to save your settings.

10 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Installing an ADCP transceiver in the user interface, page 308

Defining the EC150-3C installation parameters

To use the EC150-3C with the EK80 it must be "installed" as a part of the software configuration. Due to the built-in intelligence it is automatically detected by the EK80 software.

Prerequisites

The EC150-3C is installed according to the relevant installation instructions, and connected to the EK80 Processor Unit with a high capacity Ethernet cable. All units are turned on.

Context

The ADCP transceiver installation parameters are defined using the **Transducer Installation** page. The **Transducer Installation** page is located in the **Installation** dialog box.

Procedure

1 Open the **Setup** menu.

2 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 On the left side of the **Installation** dialog box, select **Transducer Installation**.

4 If relevant for your transducer installation, provide the accurate physical location of the transducer with reference to the vessel's coordinate system.

Use the centre of the transducer face as reference, and define the offset values related to the *Ship Origin*.

a On the **Installed Transducers** list, select the transducer.

b Select **Edit** to change the settings.

c Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the transducer is located ahead of the ship origin.

d Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the transducer is located on the starboard side of the ship origin.

e Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the transducer is located under the ship origin.

f Select **Save** to save your choices.

5 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Installing an ADCP transceiver in the user interface, page 308

Switching between ADCP and echo sounder operation

The EC150-3C is a dual purpose unit. It can be used *either* as an acoustic Doppler current profiler (ADCP) instrument to measure water current *or* as a split-beam echo sounder. It can not operate these two functions simultaneously.

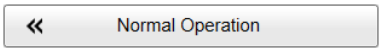
Context

This task is only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 Select operating mode.

- To activate ADCP operation, click the small option button on the left side of the **ADCP** table.
- To activate echo sounder operation, click the small option button on the left side of the **ES** table.

4 Select **OK** to save the selected setting and close the dialog box.

Result

The **Active** menu is changed accordingly.

Related topics

Choosing operating mode and key transmit parameters, page 105
Adjusting the transceiver parameters, page 257
Installing an ADCP transceiver in the user interface, page 308
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Adjusting the specific transceiver parameters for ADCP operation

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements. Some of the settings are specific for ADCP operation.

Context

Each parameter must be defined to match the properties of the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

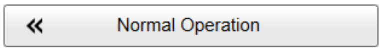
Note

This task is only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 Select the ADCP transceiver channel.

4 Select a suitable value for **Depth Cell Size**

- Use smaller depth cells in shallower waters.
- Use larger depth cells in deeper waters.

5 Select a suitable value for **Max(imum) Current Speed**

Select a value based on the expected water currents in your survey area. If you are uncertain, choose a value *above* the expected water current, and reduce it based on experience. The value you choose must always be equal or larger than the expected value.

6 Select **OK** to save the selected setting and close the dialog box.

Related topics

Adjusting the transceiver parameters, page 257
Installing an ADCP transceiver in the user interface, page 308
Extras menu, page 554
Normal Operation dialog box, page 572
Processor page, page 713
Transceiver page, page 716

Setting up the EK80 in a synchronized system

Topics

About synchronization

Whenever more than one hydroacoustic system are installed on a vessel, interference may occur. With only two systems, interference can be avoided if one of the hydroacoustic systems can control the transmissions of the other system. If multiple systems are used, they can be connected to a common synchronisation system that controls all the transmissions.

> In physics, interference is the phenomenon in which two waves superpose each other to form a resultant wave of greater or lower amplitude. Interference usually refers to the interaction of waves that are correlated or coherent with each other, either because they come from the same source or because they have the same or nearly the same frequency. Interference effects can be observed with all types of waves, for example, light, radio, acoustic, surface water waves or matter waves.
>
> *https://en.wikipedia.org/wiki/Interference_(wave_propagation), April 2016*

The Simrad EK80 may be set up to be synchronized with other hydroacoustic instruments. Synchronization is necessary to prevent several hydroacoustic systems from transmitting simultaneously. Individual transmission is often a necessity to prevent interference.

Related topics

Setting up the EK80 in a synchronized system, page 318

Synchronization modes

The purpose of the synchronization modes are to set up the EK80 to operate alone, or as a "master" or "slave" in a synchronized system.

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

The EK80 offers functionality for remote transmit synchronization. It can be set up to operate in either *Master* or *Slave* mode.

The following synchronization modes are available:

- *Stand-alone*

  Synchronization is turned off.This synchronization mode is used if the EK80 is working by itself and with no synchronization required. This is the default setting. The EK80 operates using its internal ping interval parameters, independent of any trigger signals arriving at the synchronization port.

  The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  Master mode is used if the EK80 is going to act as the controlling unit in a synchronized system. The peripheral hydroacoustic system(s) are only permitted to transmit when enabled by the EK80. When *Master* mode is selected, the EK80 will run using its internal ping interval parameters and send trigger signals to the peripheral system(s).

  This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

- *Slave*

  Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

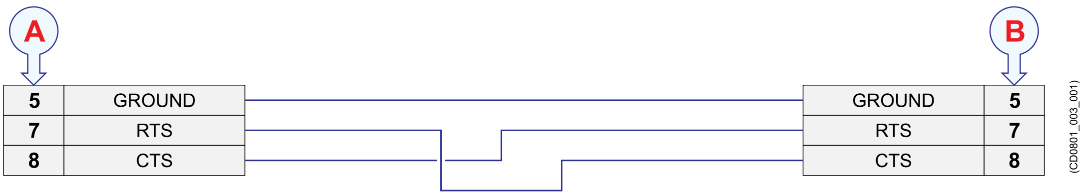
Related topics

Setting up the EK80 in a synchronized system, page 318

Synchronization using Clear To Send (CTS) and Request To Send (RTS) signals

In many applications, the synchronisation interface is based on an RS-232 serial port. Only the Clear to Send (CTS) and Request to Send (RTS) connections of the RS-232 interface are then used.

According to the standard specifications for RS-232, an output must generate a voltage level of +5 to +15 VDC (logic "low"), and -5 to -15 VDC (logic "high") into a load of 3 to 7 kΩ. An RS-232 receiver must present a 3 to 7 kΩ load , converting an input of +3 to +25 VDC to logic "low", and an input of +3 to +25 VDC to logic "high". With a positive trigger pulse, the offset voltage does not have any significance. Even small variations (flutter) over and below 0 VDC will not trigger the interface.

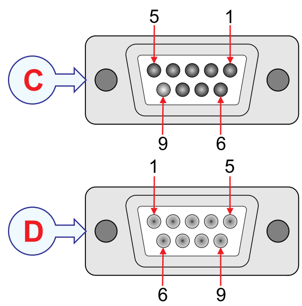


A *Local connection*

B *Connection on remote device*

C *Female 9-pin D-Subminiature connector*

D *Male 9-pin D-Subminiature connector*



Note

RS-422 communication ports can not be used for synchronization purposes. The port you wish to use must be set to RS-232.

Related topics

Setting up the EK80 in a synchronized system, page 318

Synchronization sequences

In many applications, the synchronisation interface is based on an RS-232 serial port. When you connect two systems for synchronisation using Clear to Send (CTS) and Request to Send (RTS), one system must set up as a "Master" and the other as a "Slave". When the EK80 is "Master" in a system, the synchronization can either take place in *Free running* mode, or in *Wait for slave* mode.

Slave mode

When the EK80 is set up in *Slave* mode, it must receive a trigger signal from a peripheral system every time the EK80 is going to transmit. This trigger signal is connected to a serial port on the Processor Unit, and the *Clear To Send (CTS)* pin is used to give the EK80 an "event" message. The message is processed by the EK80 software, and it will (if the previous ping has been finished) start the ping sequence.

As an acknowledgement to the synchronization trigger, the EK80 sets the *Ready To Send (RTS)* signal to a logic "low" before transmitting. This indicates that the EK80 is "busy".

Once the transmission and reception sequence ends, the EK80 sets the *Ready To Send (RTS)* signal to a logic "high" to indicate that it is ready for the next ping.

Master mode

When the EK80 is "Master" in a system, the synchronization can either take place in *Free running* mode, or in *Wait for slave* mode.

- Synchronization in *Free running* mode

  When in *Free running* mode, the EK80 will ping as fast as possible, setting its Ready to Send (RTS) signal to a logic "high" at start of each ping, and back to logic "low" at the end of the ping. The "Slave" system is triggered the when the Ready to Send (RTS) signal goes from "low" to "high".

- Synchronization in *Wait for slave* mode

  When in *Wait for slave* mode, the EK80 will wait for a logic "high" Clear to Send (CTS) signal from the "Slave" system before it starts a new ping sequence. This is the "ready to ping" acknowledge from the "Slave" system.

Note

If you use the EK80 as "Master" to control two "Slave" systems, you must connect a single cable (plus ground) from the Ready to Send (RTS) output on the Master system to the Clear to Send (CTS) input on both "Slave" systems. The return from the Ready to Send (RTS) outputs on the "Slave" systems can not be connected.

Related topics

Setting up the EK80 in a synchronized system, page 318

Synchronizing the EK80 by means of a serial port

If you want to use the EK80 as a master or slave in a synchronized system, you must set it up for such operation. To do this, you must select which communication port to use for the synchronization interface, and you must select the requested synchronization mode.

Prerequisites

This procedure assumes that:

- The vessel is berthed or at sea.
- You have an RS2-232 interface port on your Processor Unit that allows you to use the CTS/RTS connections.

For "slave" operation, a remote system (for example *K-Sync*) must be available to provide trigger pulses. For "master" operation, a remote hydroacoustic system (sonar, echo sounder) is connected. This remote system must be set up in "slave" mode.

Context

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

The EK80 offers functionality for remote transmit synchronization. It can be set up to operate in either *Master* or *Slave* mode.

Note

The Wide Band Transceiver (WBT) offers an AUXILIARY *port that can be used for synchronisation purposes. This synchronization method may be more stable that the traditional CTS/RTS connection to a serial port.*

The **Synchronization Delay** *functionality is unavailable if you use the* AUXILIARY *port on your Wide Band Transceiver (WBT) to synchronize the EK80.*

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Procedure

1 Connect the synchronization cable from the remote system to an available communication port on your Processor Unit.

  This is described in the EK80 *Installation manual*.

2 Turn on the EK80, and set it to normal use.

3 Open the **Setup** menu.

4 On the **Setup** menu, select **Installation**.

  Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

5 On the left side of the **Installation** dialog box, select **Synchronization**.

6 Select **Synchronization Mode**.

  - *Stand-alone*

    Synchronization is turned off.This synchronization mode is used if the EK80 is working by itself and with no synchronization required. This is the default setting. The EK80 operates using its internal ping interval parameters, independent of any trigger signals arriving at the synchronization port.

The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  Master mode is used if the EK80 is going to act as the controlling unit in a synchronized system. The peripheral hydroacoustic system(s) are only permitted to transmit when enabled by the EK80. When *Master* mode is selected, the EK80 will run using its internal ping interval parameters and send trigger signals to the peripheral system(s).

  This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

- *Slave*

  Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

7 Select **Synchronization Delay**.

This delay parameter is used differently depending on the chosen synchronization mode.

- *Stand-alone*

  The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  In *Master* mode, the EK80 waits for the delay time after the external trigger signal has been sent to the slaves before transmitting the ping. This is often referred to as a *pre-trigger*.

  Note

  This delay will only work when the synchronization is set up using a serial port.

- *Slave*

  In *Slave* mode, the EK80 waits for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as a *post-trigger*.

8 From the list of ports available, select **Synchronization Port**.

This is the interface port currently used to transmit or receive synchronization signals. It must be an RS-232 serial port. Since the synchronization function only uses the *Request To Send (RTS)* and *Clear To Send (CTS)* signals on a serial port, you can use a port that is already used for other purposes. For the same reason, you do not need to define any baud rate.

9 At the bottom of the page, select **Apply** to save your settings.

10 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Interfacing peripheral equipment, page 268
Setting up the EK80 in a synchronized system, page 318
Setting up depth output to an external system, page 285

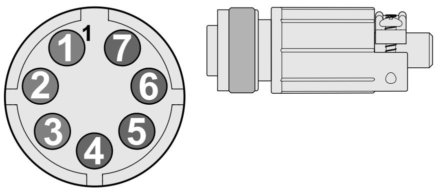
Synchronizing the EK80 by means of the Auxiliary port

The Wide Band Transceiver (WBT) offers an Auxiliary port that can be used for synchronisation purposes. This synchronization method may be more stable that the traditional CTS/RTS connection to a serial port.

Prerequisites

An external synchronisation system is connected to the Auxiliary socket on the Wide Band Transceiver (WBT).

Context



The Auxiliary socket on the Wide Band Transceiver (WBT) can be used to interface an external synchronization system.

The socket fits a Conxall 7-pin Mini-Con-X® shielded plug. The connections are made on pins 2, 3 and 5. The plug can be ordered from the manufacturer or purchased from Kongsberg Maritime. Use part number 387563.

- **Manufacturer**: Switchcraft Conxall
- **Manufacturer's website**: http://www.conxall.com

Pin number	**1**	**2**	**3**	**4**
Signal	Future use	Synchronization Output	Synchronization Input	Future use
Pin number	**5**	**6**	**7**	
Signal	Digital ground	Not used	Not used	

The parameters on the **Synchronization** page allow you to choose which communication port to use for the physical connection to the external system, and which synchronization mode to use. The **Synchronization** page is located in the **Installation** dialog box on the **Setup** menu.

Note

If you use more than one Wide Band Transceiver (WBT) in your EK80 system, all synchronization input signals to the Auxiliary *ports must be provided by the same source. Individual synchronization of a single Wide Band Transceiver (WBT) is not supported.*

If you use more than one computer in your EK80 system, the synchronization inputs to the Auxiliary *ports can not be used. This functionality is not supported.*

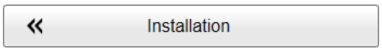
The **Synchronization Delay** *functionality is unavailable if you use the* Auxiliary *port on your Wide Band Transceiver (WBT) to synchronize the EK80.*

Procedure

1. Connect the dedicated cable from the Wide Band Transceiver (WBT) to the external synchronisation system.

   This is described in the EK80 *Installation manual*.

2. Turn on the EK80, and set it to normal use.
3. Open the **Setup** menu.
4. On the **Setup** menu, select **Installation**.

   Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

5. On the left side of the **Installation** dialog box, select **Synchronization**.
6. From the list of ports available, select **Transceiver Auxiliary Port**.
7. Observe that when **Transceiver Auxiliary Port** is selected, only *Slave* synchronization mode is permitted.

   Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

8. At the bottom of the page, select **Apply** to save your settings.
9. Continue your work in the **Installation** dialog box, or select **OK** to close it.

Related topics

Interfacing peripheral equipment, page 268
Setting up the EK80 in a synchronized system, page 318
Setting up depth output to an external system, page 285

Selecting synchronization mode

If you want to use the EK80 as a master or slave in a synchronized system, you must set it up for such operation. To do this, you must select which communication port to use for the synchronization interface, and you must select the requested synchronization mode.

Prerequisites

Neither tools nor instruments are required. The EK80 system is turned on and operates normally.

- For "slave" operation, a remote system (for example *K-Sync* or *Simrad TU40*) must be available to provide trigger pulses.
- For "master" operation, a remote hydroacoustic system (sonar, echo sounder) is connected. This remote system must be set up in "slave" mode.

The communication port on the Processor Unit is selected.

Context

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

The EK80 offers functionality for remote transmit synchronization. It can be set up to operate in either *Master* or *Slave* mode.

Procedure

1. On the **Setup** menu, select **Installation**.
2. Select **Synchronization**.
3. Select synchronization mode.
   - *Stand-alone*

     Synchronization is turned off.This synchronization mode is used if the EK80 is working by itself and with no synchronization required. This is the default setting. The EK80 operates using its internal ping interval parameters, independent of any trigger signals arriving at the synchronization port.

     The **Synchronization Delay** setting is not applicable when synchronization is switched off.
   - *Master*

     Master mode is used if the EK80 is going to act as the controlling unit in a synchronized system. The peripheral hydroacoustic system(s) are only permitted to transmit when enabled by the EK80. When *Master* mode is selected, the EK80 will run using its internal ping interval parameters and send trigger signals to the peripheral system(s).

This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

- *Slave*

  Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

4 Select the synchronization delay.

   In *Master* mode, the EK80 waits for the delay time after the external trigger signal has been sent to the slaves before transmitting the ping. This is often referred to as a *pre-trigger*.

   This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

   In *Slave* mode, the EK80 waits for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as a *post-trigger*.

   The **Delay** setting is not applicable when synchronization is turned off.

5 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Setting up the EK80 in a synchronized system, page 318

Selecting synchronization port

If you want to use the EK80 as a master or slave in a synchronized system, you must set it up for such operation. To do this, you must select which communication port to use for the synchronization interface, and you must select the requested synchronization mode.

Prerequisites

Neither tools nor instruments are required. The EK80 system is turned on and operates normally.

- For "slave" operation, a remote system (for example *K-Sync* or *Simrad TU40*) must be available to provide trigger pulses.
- For "master" operation, a remote hydroacoustic system (sonar, echo sounder) is connected. This remote system must be set up in "slave" mode.

The external system is connected to a serial communication port on the Processor Unit.

Context

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

Procedure

1. On the **Setup** menu, select **Installation**.
2. Select **Synchronization**.
3. Choose which serial port you have used to connect the external synchronization system.
4. Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Setting up the EK80 in a synchronized system, page 318

Installing and maintaining software

Topics

Installing the EK80 operational software

If your EK80 Wide band scientific echo sounder is provided with a Processor Unit, the EK80 software has already been installed. If you intend to use your own computer, you must install the software yourself.

Prerequisites

In order to install the software, you need the relevant file set on a suitable media. If the software is provided on a CD or a DVD, and your computer is not fitted with a suitable drive, copy the files to a USB flash drive.

Note

Make sure that you have administrative rights on the Processor Unit. You need this to install the software. If you purchased your own computer, you must verify that it meets the technical requirements for use with the EK80. Do this before you install the software.

Context

One or more valid software licenses are required to operate the EK80. The software licenses are installed after the EK80 software installation. The **Software License** page is provided for this purpose.

Procedure

1 Turn on the Processor Unit.

2 Switch off any firewall applications.

3 Insert the EK80 software media.

If the EK80 software is provided on a CD or DVD, and your Processor Unit is not fitted with a suitable drive, copy the files to a USB flash drive.

4 Use a file manager application on the Processor Unit to access the software files.

5 Double-click `Setup.exe` to start the installation.

Note

If the operating system on your computer is not supported, the installation will stop with an error message. You must then upgrade your computer - or use a different one - to complete the software installation.

6 Allow the installation wizard to run. Follow the instructions provided.

We recommend that you install the software in the default folder suggested by the wizard. In the last dialog box you are permitted to remove old settings. Since this is your first installation of the software, you can disregard this option.

7 Once the software installation has been completed, double-click the icon on the desktop to start the program.

8 Depending on your operating system parameters, certain dialog boxes may open.

a The Windows® Firewall may open a dialog box requesting information about the network. Select **Public**, and then select **Allow access**.

b The operating system may also open other dialog boxes to verify that the EK80 software can run on the computer. You must permit this.

Further requirements

Observe the dedicated procedures for obtaining and installing the software licence(s).

Related topics

Installing and maintaining software, page 329

Obtaining and installing the software license

To operate the EK80 with a transceiver you need a valid software license. Before you can use the EK80 you must obtain a "license string" and install it on your Processor Unit. Without a license you will not be able to communicate with the transceiver.

Prerequisites

This procedure assumes that the EK80 operating software has been successfully installed on the Processor Unit.

Context

The software license is a 32 character hexadecimal string based on the transceiver's serial number. It defines several key parameters that control the functionality and behaviour of the transceiver(s) you use. Each software license code "unlocks" one transceiver for operational use with a set of predefined properties.

The software license is not linked to the physical Processor Unit. You can therefore easily move the software from one computer to another, just remember to make a copy of the license string.

Note

Once you receive your software license string(s), do not lose them. We suggest that you copy the information into a text file (for example Notepad), and add relevant information. Place the text file on the Processor Unit desktop, and make sure that backup copies are made.

In order to obtain a software license you must contact a Simrad dealer or distributor. You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

Note

This information is only valid if your EK80 is meant to operate with a Wide Band Transceiver (WBT), a WBT Mini or a WBT Tube.

Procedure

1. Obtain the necessary information about your transceiver(s) and transducer(s).
   Write down:
   a. The serial number for each transceiver.
   b. The beam type.
   c. Which transducers you have connected to each transceiver.
2. Send the necessary information to one of Simrad's dealers or distributors.

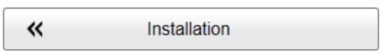
   You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

   You can use the following e-mail address:

   - purchase.order@simrad.com

Once the software license string(s) have been returned to you (most likely by e-mail), you can install the licenses into the software.

3. On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Software License**.

Observe that the **Software License** page opens.

5 Select **Type License String**, and type the license string into the dialog box.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard. If you have received the license string on an electronic format (e-mail or text file), you can copy the string from the source document and paste it into the **Type License String** dialog box.

6 Select **OK** to save the license string and close the **Type License String** dialog box.

7 Verify that the license string is placed in the **Currently active licenses** list.

If necessary, select the license string on the left side, and click the arrow button [>] to move it to the **Currently active licenses** list.

8 Select **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

Installing and maintaining software, page 329

Defining the IP address on the Processor Unit network adapter for communication with the transceiver

The Processor Unit and the transceiver(s) communicate on a high capacity Ethernet cable. If more than one transceiver is used, an Ethernet switch is added. On the Processor Unit, define the IP address and Subnet mask for the Ethernet port used to communicate with the transceiver(s). EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

Prerequisites

This procedure is made for the Microsoft® Windows® 10 operating system. It is assumed that you are familiar with this operating system.

Context

As long as you do not replace the Processor Unit or the network adapter in the Processor Unit, you only need to do this once.

Procedure

1 On the Processor Unit, close the EK80 program.

2 Open the **Network Connections** dialog box.

a In the bottom-left corner of your desktop, select the Windows® search function.

b In the search box, type "Network Connections", and open the **Network Connections** dialog box.

3 Right-click the network adapter you are going to use and select **Properties** on the shortcut menu.

4 On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.

5 Select **Use the following IP address**, and type the IP address and network mask.

- **IP Address**: 157.237.15.12

  Any address can be used, but 157.237.15.12 is recommended for legacy reasons. This is particularly important if your system contains old GPT transceivers.

- **Subnet mask**: 255.255.255.0

  You can leave **Subnet mask** blank and select **OK**. When you see an error message saying that the message subnet mask is missing, select **OK** again. A default subnet mask is then automatically generated.

6 Select **OK** to save the selected settings, and then close all the dialog boxes.

7 Start the EK80 program.

8 Open the **Transceiver Installation** page.

a Open the **Setup** menu.

b On the **Setup** menu, select **Installation**.

c On the left side of the **Installation** dialog box, select **Transceiver**.

9 Under **Transceiver Browsing** insert the IP Address that you just specified for the Ethernet adapter.

10 At the bottom of the page, select **Apply** to save your settings.

11 Turn each transceiver off and on.

This forces the EK80 to assign new IP addresses within the selected IP range.

Related topics

Installing and maintaining software, page 329

Upgrading the EK80 operational software

When a new EK80 software version is released, it must be installed on your Processor Unit.

Prerequisites

In order to upgrade the EK80 software, you need the relevant file set on a suitable media. If the EK80 software is provided on a CD or a DVD, and your computer is not fitted with a suitable drive, copy the files to a USB flash drive.

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Context

The EK80 needs one or more software licenses to work. Each software license code "unlocks" one Wide Band Transceiver (WBT) for operational use with a set of predefined properties. The software licences are not affected by the software upgrade.

The new version of the EK80 will automatically replace the old version.

Procedure

1 Read the software release note to see if special actions are required.

The software release note can be downloaded from our website.

- https://www.simrad.com

2 Turn on the Processor Unit.

3 Switch off any firewall applications.

4 Insert the EK80 software media.

If the EK80 software is provided on a CD or DVD, and your Processor Unit is not fitted with a suitable drive, copy the files to a USB flash drive.

5 Use a file manager application on the Processor Unit to access the software files.

6 Double-click `Setup.exe` to start the installation.

Note

If the operating system on your computer is not supported, the installation will stop with an error message. You must then upgrade your computer - or use a different one - to complete the software installation. The EK80 supports Microsoft® Windows® 7 SP1 (v6.1.7601) and later.

7 Allow the installation wizard to run. Follow the instructions provided.

We recommend that you install the software in the default folder suggested by the wizard.

In the last dialog box you are permitted to remove old settings. Read the options carefully. Do not remove any existing settings unless this is your intention.

8 Once the software installation has been completed, double-click the icon on the desktop to start the program.

Further requirements

Certain software upgrades for the EK80 also include an upgrade for the Wide Band Transceiver (WBT). To ensure maximum operational performance, these software versions must always be compatible.

Related topics

Installing and maintaining software, page 329

Moving the software license from one Processor Unit to another

Without a license you will not be able to communicate with the transceiver. The software license for the EK80 is not linked to the physical Processor Unit. If necessary, you can therefore easily move the EK80 software from one computer to another.

Prerequisites

This procedure assumes that:

- Your existing EK80 is operational with all necessary software licenses installed.
- You have a new computer to be used as Processor Unit.
- The EK80 software has been installed on the new Processor Unit.
- The new Processor Unit is connected to the transceiver(s).

In order to do this task you will need a small text editor (for example the Microsoft® *Notepad*) running on both computers. You will also need a USB flash drive.

Context

The software license is a 32 character hexadecimal string based on the transceiver's serial number. It defines several key parameters that control the functionality and behaviour of the transceiver(s) you use. Each software license code "unlocks" one Wide Band Transceiver (WBT) for operational use with a set of predefined properties.

Procedure

1 Start the EK80 on the "old" Processor Unit.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.

Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side of the **Installation** dialog box, select **Software License**.

5 Copy all the current license strings to a text file on the USB flash drive.

  a Move all the software licenses to the **Currently active licenses** list.

  b Insert a USB flash drive on your computer.

  c Open a small text editor.

  d For each software license string:

    1 Click on the license string to select it.

    2 Select **Copy** to copy the license string to the computer's clipboard.

    3 Activate the text editor, and paste in the license string.

e When all the software license strings have been pasted into the text file, save it to the USB flash drive.

f Remove the USB flash drive, and insert it on the "new" Processor Unit.

6 Start the EK80 on the "new" Processor Unit.

7 Install the license strings using copy/paste from the text file.

Related topics

Installing and maintaining software, page 329

Removing the EK80 operational software

If you wish to replace your Processor Unit with a new unit, or simply do not wish to use the EK80 any longer, you can remove the software.

Prerequisites

This procedure is made for the Microsoft® Windows® 7 operating system. It is assumed that you are familiar with this operating system. Operation in Microsoft® Windows® 10 is very similar.

Context

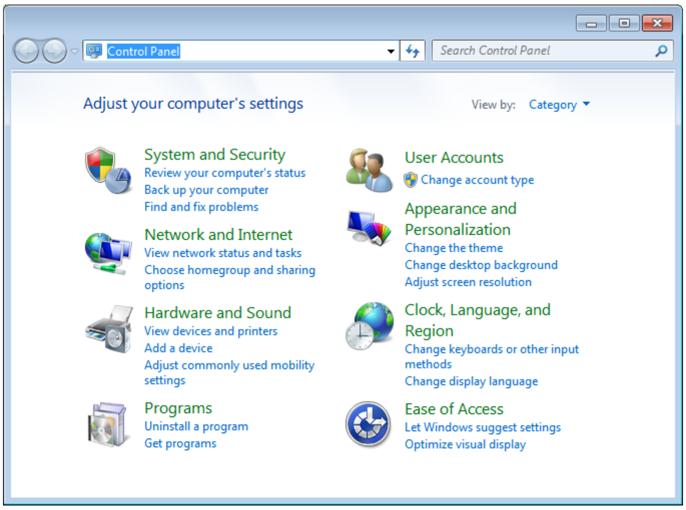
Removal of the EK80 software is done using functionality provided by the operating system.

Procedure

1 Turn on the Processor Unit.

2 In the bottom-left corner of your desktop, select the Windows® **Start** button.

3 On the right-hand side of the **Start** menu, select **Control Panel**.



Observe that the Control Panel opens.

4 Uninstall the EK80.
   a In the top right corner of the Control Panel, select *Category* view.
   b Under **Programs**, select **Uninstall a program**.
   c On the list of programs, locate the EK80 software.
   d Select the program, and then select **Uninstall**.
   e Follow the instructions provided by the wizard.
5 Click the [**X**] in the top right corner to close the Control Panel.

Related topics

Installing and maintaining software, page 329

Checking the current software version

Every EK80 software release is uniquely identified. You can easily identify your current software version and the relevant release information in the **About** dialog box.

Context

Every EK80 software release is uniquely identified. The **About** dialog box identifies the current EK80 software version with its release date. The version described in this Reference Manual is 2.0.0.

If you wish to find the latest software version for the EK80, check our website.

- https://www.simrad.com

Procedure

1 Open the **Setup** menu.
2 Select **About** to open the dialog box.
3 Find the information that you need.
4 Select **Close** to close the dialog box.

Further requirements

Certain software upgrades for the EK80 also include an upgrade for the Wide Band Transceiver (WBT). To ensure maximum operational performance, these software versions must always be compatible.

Related topics

Installing and maintaining software, page 329

Upgrading the software on the Wide Band Transceiver (WBT)

Certain software upgrades for the EK80 also include an upgrade for the Wide Band Transceiver (WBT). To ensure maximum operational performance, these software versions must always be compatible.

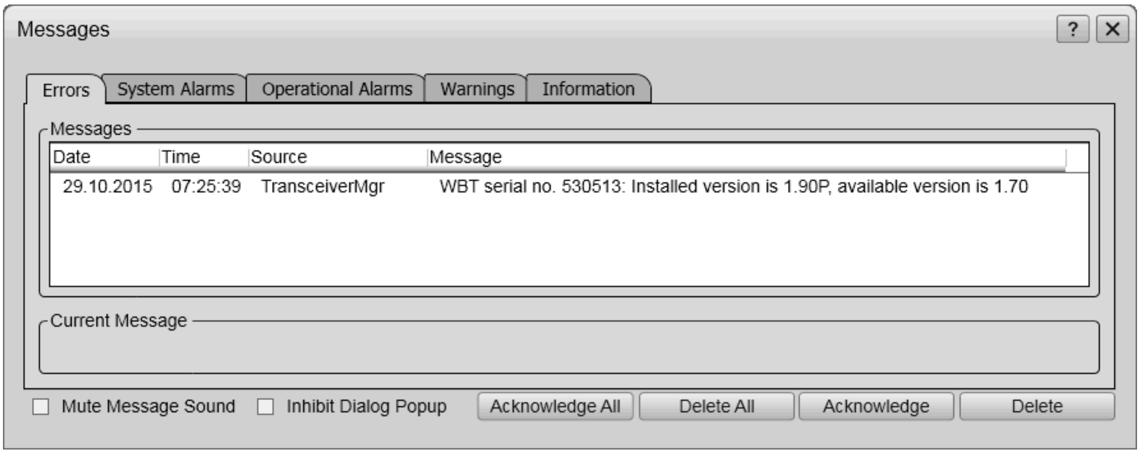
Prerequisites

In order to upgrade the EK80 software, you need the relevant file set on a suitable media. If the EK80 software is provided on a CD or a DVD, and your computer is not fitted with a suitable drive, copy the files to a USB flash drive.

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Context

When the EK80 is powered up for normal use, the software checks that the operation software version matches the software version in the Wide Band Transceiver (WBT). If there is a mismatch, an error message will be provided.



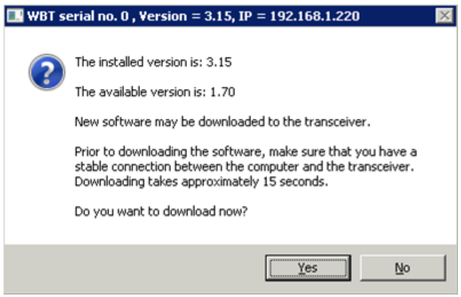
The software download process is supported by several dialog boxes with information.

Note

Before you update the transceiver software, make sure that you only have one computer running the EK80 software in your network. This computer must be connected to all the relevant transceivers. Cycle the power on the transceivers before you download the transceiver software.

The screen captures are provided as examples. They do not reflect the latest software version.

Procedure



1 If you have more than one Processor Unit connected to your EK80 system:

  a Disconnect all computers from the EK80 system except one.

  b Turn each transceiver off and on.

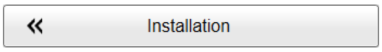
  This is important to ensure that each transceiver has an IP address from the only Processor Unit currently online.

2 Turn on the Processor Unit, and start the EK80 program.

3 Set **Operation** to *Inactive*.

4 Open the **Setup** menu.

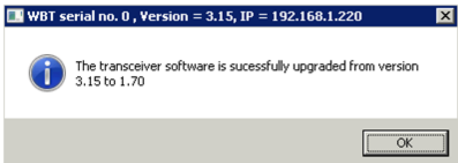
5 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

6 On the left side, select **Transceiver**.

Observe that the **Transceiver Installation** page opens.



7 Download the new software version.

  a In the list of transceivers, select the transceiver you wish to upgrade.

  b Select **Download Transceiver Software**.

  c In the dialog box that opens, choose the software file you wish to use, and select **Open**.

  The file name reflects the type of receiver the software is created for.

  d Observe the information provided in the next dialog box.

  e If you still wish to download and install the software, select **Yes**.

  Note

  The communication between the Processor Unit and the Wide Band Transceiver (WBT) must not be interrupted while the software is downloaded!

  f Wait while the software downloads.

  g Observe the resulting message.

  If the download process fails, restart it.

   h If you have more than one transceiver, repeat the download process for the next one.

8 When the software has been downloaded, close all dialog boxes, and resume with normal operation.

Further requirements

If the download process fails repeatedly, contact your dealer or Simrad support.

Related topics

Installing and maintaining software, page 329

Maintaining the EK80

Topics

Checking transceiver and transducer settings

In order to use the EK80, the Processor Unit must be connected to one or more transceivers, and each of them must in turn be connected to one or more transducers. Each channel must be installed before it can be put to use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. It is often useful to verify that all the channels are properly set up. This is a requirement for the EK80 performance.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*. The EK80 system is turned on and operates normally. Minimum one Wide Band Transceiver (WBT) with one or more transducers has been connected.

Context

If you are using a EK80 that has been in use for some time, you can safely assume that the transceivers and transducers have been set up properly. However, the procedure may prove useful if you are an inexperienced user. Make sure that you do not change any important settings.

Note

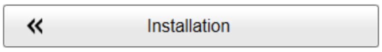
When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this* *before* *you continue working on a different page.*

Procedure

1 Make sure that the currently connected transducer(s) are shown as "tabs" at the bottom of the EK80 presentation.

2 Open the **Setup** menu.

3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

4 On the left side, select **Transducer Installation**.

On the **Installed Transducers** list, select one of the transducers. Observe that the **Transducer** page opens with all settings unavailable. This is a safety precaution to prevent unintentional changes to the transducer settings. To make any changes, you must select **Edit**.

5 Make sure that each transducer has been installed with all settings defined.

The physical location of the EK80 transducer is important for the EK80 data accuracy. The offset value for "X" defines the vertical location (the depth) of the transducer face.

This is the installation depth of the transducer; the vertical location of the transducer face relative to the water surface. In order to measure correct water depth, the EK80 needs to know the vertical distance between the vessel's water line and the acoustic face of each transducer. The depth of each individual transducer must be defined manually. Enter the depth as a positive number. If the displacement of your vessel changes considerably, you may consider changing this parameter often. For accurate location of the transducer, you need the detailed vessel drawings.

6 On the left side of the **Installation** dialog box, select **Transceiver**.

Observe that the **Transceiver Installation** page opens.

7 Make sure that all applicable transceivers and transducers are connected and operational.

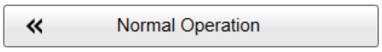
For each transceiver, this is indicated by the green label with text "Installed".

8 Close the **Installation** dialog box without making any changes.

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements.

9 Open the **Operation** menu.

10 On the **Operation** menu, open the **Normal Operation** dialog box.



11 For each channel (if necessary):

a Set **Pulse Type** to a *LFM* or *CW* mode as permitted by your license and the transducer.

b Set **Mode** to *Active*.

c Set **Pulse Duration** to your chosen value.

d Set **Power** to the correct power level for the transducer.

e Set **Start Frequency** and **End Frequency** to values permitted by your license and the transducer.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

12 Close the dialog box.

Related topics

Starting normal operation, page 35
Getting started, page 93
Starting normal operation, page 93
Maintaining the EK80, page 341
Transceiver pages, page 677
Transceiver Installation page, page 679
Transceiver IP Address page, page 686

Monitoring the supply voltage

The *Transceiver Power Supply* information pane shows you the current supply voltage provided to the transceiver. This is very useful if you operate your EK80 from a battery.

Context

If you operate your EK80 from a battery, it is very useful to keep an eye on the supply voltage. The EK80 software measures this supply voltage in the transceiver, and the result is automatically returned to the *Transceiver Power Supply* information pane.

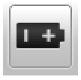
- As long as the supply voltage is kept between 11.5 and 15 Vdc, the transceiver will work normally.
- If the supply voltage drops to any value between 10 and 11.5 Vdc the transceiver will still work, but the EK80 will give you a message to say that the supply voltage is low.
- If the supply voltage drops to below 10 Vdc, the transceiver will stop. The EK80 will then notify you with another message.

One information pane shows you the supply voltage for all the transceivers in use on your EK80 system. The information pane shows the supply voltage for all transceivers that broadcast this information on the communication link to the Processor Unit. This includes the Wide Band Transceiver (WBT) and the General Purpose Transceiver (GPT). The WBT Mini and WBT Tube transceivers are also supported.

Procedure

1 Click in any echogram view to make it active.

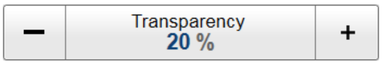
2 On the top bar, select *Transceiver Power Supply*.



3 Change the physical size and shape to fit your preferences.

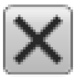
Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

4 Use the **Transparency** function to control how much you can see "through" the information pane.



You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%. The **Transparency** function is located on the **Display** menu.

5 Select **Close** in the top right corner to close the information pane.



Related topics

Maintaining the EK80, page 341
Transceiver Power Supply information pane description, page 488

Updating the online help file

EK80 has a comprehensive context-sensitive on-line help system. The help file is updated periodically. You can then update your EK80 installation with the new information.

Prerequisites

In order to update the on-line help system, you need a USB flash drive. Your computer must have a suitable utility to unpack ZIP files. We recommend that you connect a computer keyboard to your Processor Unit.

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Context

The context sensitive on-line help is provided using a *WebHelp* installation using HTML format. It uses the default web browser on the Processor Unit. The help system comprises a large number of files collected in a ZIP file.

Procedure

1 Obtain the new help file.

   a Download the help file from the EK80 pages on https://www.simrad.com to a computer.

   b Unpack the ZIP file, and place all the files in a folder named `HTML`.

   c Copy the `HTML` folder to a USB flash drive.

2 Turn on the EK80.

3 Open a file manager utility.

   a On the computer keyboard, press ⊞ **Win+E** to open the file manager.

   or:

   a Observe the **Screen Captures** tab at the bottom of the EK80 presentation.

   b Select the **Screen Captures** tab to open the screen capture browser.

   c In the browser, select **Open Image Folder** to open the operating system folder.

4 Navigate to the folder with the on-line help files.

   `c:\Program Files (x86)\Simrad\NGE\EK80\EK80_Settings\Language`

   Observe that the folder contains one sub-folder for each language. Examples are "en" for English, "es" for Spanish and "de" for German. Language folders may be missing. In such cases, the EK80 help is provided in English.

5 Update the existing help file.

   a Open the relevant language folder.

   b Rename the existing `HTML` folder to `HTML_Old`.

   c Copy the entire `HTML` folder from the USB flash drive to the language folder.

   d Make sure that the structure in the new `HTML` folder is identical to the old (`HTML_Old`).

6 Close the file manager utility.

7 Restart the EK80.

Related topics

Maintaining the EK80, page 341

Adding an online help file in a new language

EK80 has a comprehensive context-sensitive on-line help system. Help is occasionally available in a new language. You can then update your EK80 installation with the new information.

Prerequisites

In order to update the on-line help system, you need a USB flash drive. Your computer must have a suitable utility to unpack ZIP files. We recommend that you connect a computer keyboard to your Processor Unit.

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Context

The context sensitive on-line help is provided using a *WebHelp* installation using HTML format. It uses the default web browser on the Processor Unit. The help system comprises a large number of files collected in a ZIP file.

Procedure

1 Obtain the new help file.

   a Download the help file from the EK80 pages on https://www.simrad.com to a computer.

   b Unpack the ZIP file, and place all the files in a folder named `HTML`.

   c Copy the `HTML` folder to a USB flash drive.

2 Turn on the EK80.

3 Open a file manager utility.

   a On the computer keyboard, press ⊞ **Win+E** to open the file manager.

   or:

   a Observe the **Screen Captures** tab at the bottom of the EK80 presentation.

   b Select the **Screen Captures** tab to open the screen capture browser.

   c In the browser, select **Open Image Folder** to open the operating system folder.

4 Navigate to the folder with the on-line help files.

   `c:\Program Files (x86)\Simrad\NGE\EK80\EK80_Settings\Language`

   Observe that the folder contains one sub-folder for each language. Examples are "en" for English, "es" for Spanish and "de" for German. Language folders may be missing. In such cases, the EK80 help is provided in English.

5 Add the new help file.
   a Create a folder for the new language.

      Make sure that you use the correct folder name. We use the language codes defined by ISO 639-1.
   b Copy the entire `HTML` folder from the USB flash drive to the language folder.
   c Make sure that the structure in the new language folder is identical to the structure in the `EN` (English) folder.
6 Close the file manager utility.
7 Restart the EK80.

Related topics

Maintaining the EK80, page 341

Accessing and retrieving message log files

EK80 uses messages as a part of the built-in test equipment (BITE). The messages offer information about the operational status of the EK80. Whenever the EK80 issues a message, it is shown in the **Messages** dialog box. Simultaneously, all messages are stored in a number of log files on the Processor Unit hard disk. If you experience abnormal behaviour, and wish to consult support, these log files are very useful.

Prerequisites

You need a USB flash drive, a portable hard disk, or another storage device to keep the log files. It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Procedure

1 Prepare a data storage device.
2 If you have a computer keyboard connected to your Processor Unit, press ⊞ **Win+E** to open the file manager.
3 Without a keyboard:
   a Observe the **Screen Captures** tab at the bottom of the EK80 presentation.
   b Select the **Screen Captures** tab to open the screen capture browser.
   c In the browser, select **Open Image Folder** to open the operating system folder.
4 Navigate to the folder with the log files.

   `c:\programdata\Simrad\EK80\Log`
5 Copy the files to the USB flash drive.
6 Close the file manager utility.
7 Send the file(s) by e-mail to your support contact.

Related topics

Maintaining the EK80, page 341

Measuring noise in passive operating mode

Low noise is a key factor for high quality and reliable measurements. The performance of the EK80 will always be limited by different noise sources. The noise is measured while the EK80 operates in *Passive* mode with the transmit pulses disabled.

Prerequisites

The EK80 is installed as specified in the EK80 *Installation manual*.

- The EK80 system is turned on and operates normally.

  Caution

  You must never set the EK80 to "ping" unless the transducer is submerged in water. The transducer may be damaged if it transmits in open air.

- All the relevant transceivers have been set up, and they are operational with their respective transducers.
- All relevant channels (transceiver/transducer combinations) are installed in the user interface.
- All relevant external sensors are connected to the EK80. The sensors are turned on and operate normally.
- The vessel is berthed or at sea.

In order to do this test, the ship must be "silent".

- The water must be as deep as possible. Recommended minimum depth is 100 metres.
- There must be no other vessels in the vicinity.
- The vessel must lie still in the water.
- As much machinery as possible must be turned off. It is particularly important to turn off electrical motors, as well as cooling systems and hydraulic pumps that may cause electric noise.
- To prevent interference, all other hydroacoustic instruments must be turned off.

Note

With the vessel in port, the environmental conditions are not satisfactory. In the shallow waters of the port, noise from other vessels, dockyard workers or machinery will cause unreliable test results. If you do this tests in a busy harbour, or with noise sources present, the sensitive receivers will detect all the noise in the nearby waters.

Neither tools nor instruments are required.

Context

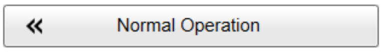
It is essential that the noise signature is as low as possible. The **Noise** page provides information about the current estimated noise, and the equivalent ambient noise. Your EK80 must be set to *Passive* mode.

Procedure

1 To select *Passive* mode, use the **Normal Operation** dialog box.

   a Open the **Operation** menu.

   b Select **Normal Operation**.



   c For the relevant transceiver channel, set **Mode** to *Passive*.

   d Select **OK** to save the selected setting and close the dialog box.

   Note

   If you set **Mode** *to Passive, your EK80 will no longer provide any information in the echogram(s).*

2 Open the **Setup** menu.

3 Select **BITE** to open the dialog box.

4 Select **Noise** to open the page.

5 CW transmissions:

   When you work with CW transmissions, the noise is presented in text boxes.

   a Read and record the noise values.

6 LFM transmissions:

   When you work with LFM transmission, the noise is presented in a plot. The plot shows the noise level as a function of the transmission frequency. The noise estimated, in dB relative to 1W, is shown in a box.

   a Select **Fixed Axis** to make the curves easier to read.

   b Read and record the noise values.

Related topics

Maintaining the EK80, page 341

Making a noise/speed curve to determine vessel noise

The performance of the EK80 will always be limited by different noise sources. During the Reference Manual, accurate noise measurements are done for different vessel speeds. The weather and sea conditions for the noise measurements will be those at the time of the test.

Prerequisites

The EK80 system is turned on and operates normally. All the relevant transceivers have been set up, and they are operational with their respective transducers.

You need the following equipment:

- Personal computer
- Spreadsheet program

Context

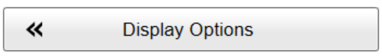
In order to measure the noise, you must record the noise value using the tooltip in the echogram. Since the noise will vary with each ping, you must make five measurements for each vessel speed, and then calculate the average noise. You must measure the noise for each single channel, but you can do all these measurements simultaneously.

Tip

If you record all the raw data during the noise test, you can repeat the test later using the replay file. You may then use more than five noise samples for each vessel speed to make a more accurate curve.

Procedure

1. Open the **Display** menu.
2. Select **Display Options** to open the dialog box.



   a. Select **Tooltip** to open the page.
   b. Select **Noise** to enable the tooltip.
   c. Select **OK** to save the selected setting and close the dialog box.
3. Establish a separate communication line with the bridge to verify the vessel speed during the test.
4. To start data recording, open the **Record** button, and select *On*.
5. Repeat the following cycle for each vessel speed:
   a. Ask the bridge to set the speed.
   b. Once the bridge reports that the speed has been obtained, select **Event** on the toolbar.

c If possible, verify the vessel speed on the top bar.

d For each channel, place the cursor five different places on the echogram on the right side of the event marker, and record the noise values.

e Calculate the average noise in each channel, and record it in the table.

f Ask the bridge to set the next speed.

6 Stop the recording.

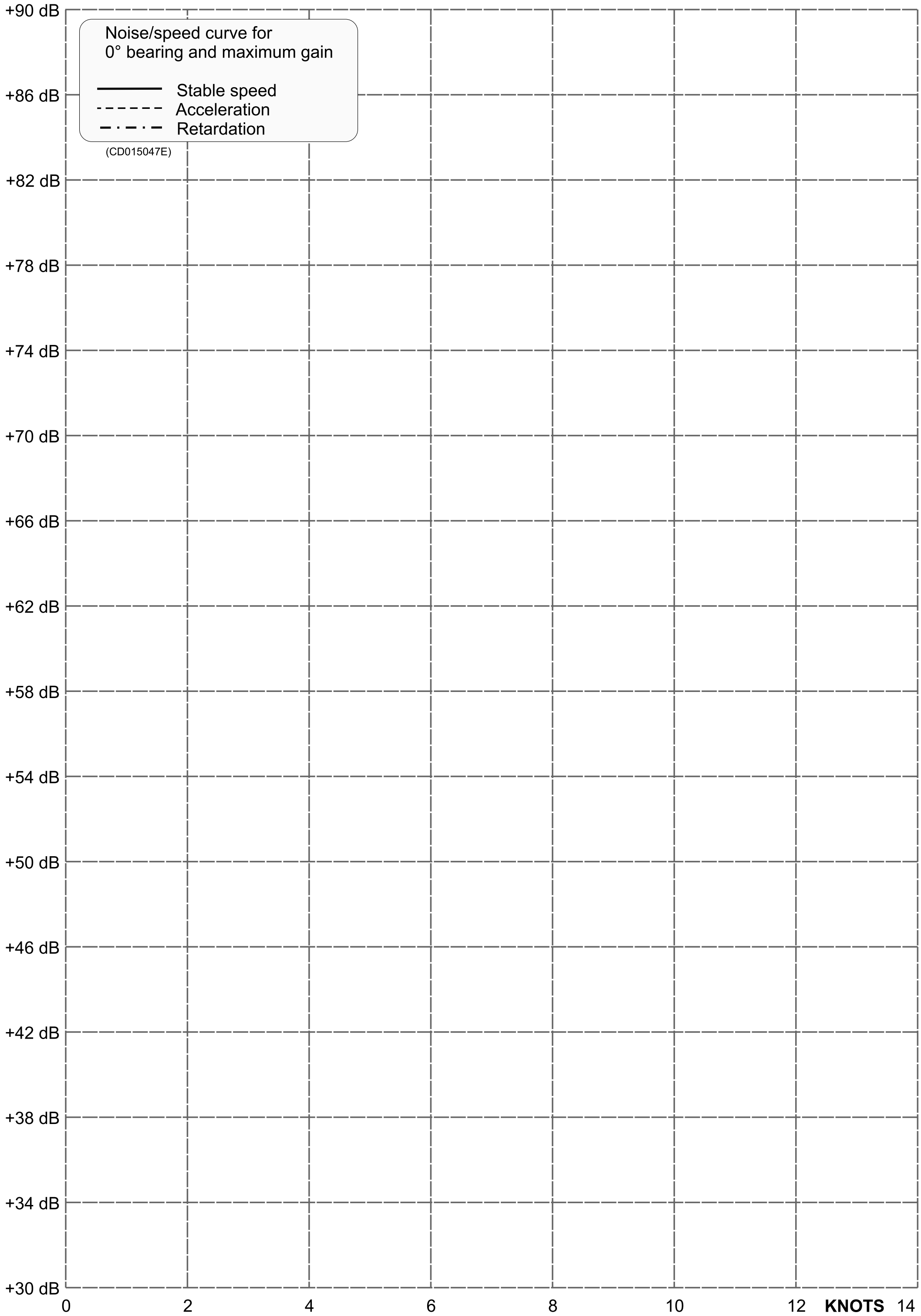
Save the data using a unique file name that identifies context, date, time and vessel. Attach the data file to the electronic copy of the test report.

7 When all the measurements have been made, type the data (speed and noise) into a spreadsheet to create the curve.

Result

Speed/Noise						
Speed	**M1**	**M2**	**M3**	**M4**	**M5**	**Average**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
Channel:						
Sea state:						
Use this table to record the values. Alternatively, you can type the values straight into a spreadsheet. Make the necessary copies so that you have one table for each channel.						

Use the following plot to record the noise values.



Test requirements	Results
A noise/speed curve is created.	
Date and signature:	

Related topics

Maintaining the EK80, page 341

Checking the transducer by means of the BITE functionality

The EK80 can be set up to work with one or more transceivers. In turn, each transceiver is assigned one or more transducers. By means of the BITE (Built-In Test Equipment) system, you can check the impedance of each transducer during normal operation. Any errors are then easily detected.

Prerequisites

The EK80 system is turned on and operates normally. Neither tools nor instruments are required.

Context

The transducer impedance is measured in real time during each transmission ("ping"). For LFM transmissions, the results are shown in two plots.

- If the current transmit mode is *CW*, the x-axis shows time (one ping).
- The other plot shows the phase as a function of the frequency in the same ping.

In each plot, one coloured curve is provided for each transducer or transducer sector. A single beam transducer is shown with only one curve. A split beam transducer is shown with several curves, one for each sector.

Procedure

1 Open the **Setup** menu.

2 Select **BITE** to open the dialog box.

3 Select **Transducer** to open the page.

4 Select which transducer to monitor.

5 Observe the impedance curve for the chosen transducer.

Select **Fixed Axis** to make the impedance curves easier to read.

An operational transducer element will have an impedance of approximately 75Ω ±40%. However, various transducers will have different values, and you need to check the relevant data sheet. Composite transducers have a relatively flat impedance curve. Older transducers with "ton-pilz" elements have a slightly higher impedance at the beginning of the ping. This is by design.

- If you measure ∞Ω (open circuit), you can assume that the transducer impedance transformer has broken, or that the cable is damaged.
- If you measure 0Ω (short), you can assume that either the transducer impedance transformer or the cable has shorted. You may also have a problem with salt water penetration.

6 Select **OK** to close the dialog box.

Related topics

Maintaining the EK80, page 341

Inspecting and cleaning the transducer face

Marine growth (biological fouling) on the transducer face reduces the EK80 performance. For this reason, it is important to keep the transducer face clean. Every time your vessel is in dry dock, you must remove the marine growth. At the same time, you must inspect the transducer closely for physical damage.

Prerequisites

The following tools and consumables are required.

- Personal protection
- Fresh water
- A mild synthetic detergent and a plastic brush
- A piece of wood or plastic without sharp corners
- Citric acid (<50%) (only if required)

Context

During normal use, the transducer is subjected to biological fouling. If this marine growth is excessive, it will reduce the performance of the EK80. Whenever opportunity arise, typically when the vessel is dry-docked, the transducer face must be cleaned for shells and other marine growth.

It is important to check the transducer for physical damage. Any cracks, fractures or holes in the red protective coating may result in a water leak, and a leak may cause irreparable damage to the transducer.

A transducer must always be handled as a delicate instrument. Incorrect actions may damage the transducer beyond repair. Observe these transducer handling rules:

- **Do not** activate the transducer when it is out of the water.
- **Do not** handle the transducer roughly. Avoid impacts.
- **Do not** expose the transducer to direct sunlight or excessive heat.

- **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer face.
- **Do not** damage the outer protective skin of the transducer face.
- **Do not** lift the transducer by the cable.
- **Do not** step on the transducer cable.
- **Do not** damage the transducer cable, and avoid exposure to sharp objects.

Procedure

1 Allow for sufficient access to clean and inspect the entire surface of the transducer.

2 Remove biological fouling carefully using a plastic brush, a suitable synthetic detergent and fresh water.

   Biological material which is strongly rooted in the substrate can be removed carefully with a piece of wood or plastic. If required, you can also use citric acid. Apply, leave it working for several hours, and rinse thoroughly with fresh water.

   Note

   Do not *use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer face.* ***Do not*** *damage the outer protective skin of the transducer face.*

3 Allow the transducer surface to dry.

4 Do a thorough visual inspection of the transducer.

   Check for dents, scratches, holes or other damage to the surface.

   If you find suspicious damage, take high resolution photos that show the damage. Contact your dealer or the Simrad support organization for advice.

5 If necessary, apply anti-fouling paint as described in the dedicated procedure.

   Note

   Because some paint types may be aggressive to the polyurethane in the transducer, consult our list of approved paints.

Related topics

Maintaining the EK80, page 341

Painting the transducer face

Marine growth (biological fouling) on the transducer face reduces the EK80 performance. We recommend that you paint the transducer face immediately after installation, and then again as often as required to maintain the protection.

Prerequisites

The following tools and consumables are required.

- Personal protection
- Fresh water
- A mild synthetic detergent and a plastic brush
- Fine-grade sandpaper (240 inch grit size)
- Primer
- Anti-fouling paint
- Wet film gauge
- Airless spray

Because some paint types may be aggressive to the polyurethane in the transducer, consult our list of approved paints.

Context

The transducer has not been designed with any protection against biological fouling. Anti-fouling paint may therefore be applied to the transducer face. To minimize the negative acoustical effects the layer of anti-fouling paint must be as thin as possible.

Note

The anti-fouling paint will reduce the acoustical performance of the transducer. The surface roughness of the transducer substrate and the thickness of the paint may also influence the performance. Kongsberg Maritime cannot be held responsible for any negative consequences of the anti-fouling paint.

Observe the relevant instructions and safety information provided by the paint manufacturer.

Procedure

1 Clean the transducer thoroughly.

Make sure that you remove all oil grease residues, as well as salt and other contamination.

2 Allow the transducer surface to dry.

3 Abrade the transducer surface using a sanding paper with 240 inch grit size.

Do not exceed a surface roughness (R_{max}) of 35 microns as this can influence the EK80 performance.

4 Remove all dust.

5 Apply the primer, and let it dry.

6 Apply the paint.

Observe the instructions provided by the paint manufacturer. Use airless spray. Apply the minimum specified film thickness per coat and for the complete layer. It is not possible to measure dry film thickness on transducer surface. You must therefore use a wet film gauge to frequently measure the paint thickness.

Note

We strongly recommend that you do not use a paintbrush and/or a roller.

7 Allow the paint to dry.

Further requirements

The contractor or shipyard must keep a daily paint log recording all relevant information from the surface treatment.

Related topics

Maintaining the EK80, page 341

Rules for transducer handling

To secure long life and accurate results, the transducer must be handled correctly.

A transducer must always be handled as a delicate instrument. Incorrect actions may damage the transducer beyond repair. Observe these transducer handling rules:

1 **Do not** activate the transducer when it is out of the water.

2 **Do not** handle the transducer roughly. Avoid impacts.

3 **Do not** expose the transducer to direct sunlight or excessive heat.

4 **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer face.

5 **Do not** damage the outer protective skin of the transducer face.

6 **Do not** lift the transducer by the cable.

7 **Do not** step on the transducer cable.

8 **Do not** damage the transducer cable, and avoid exposure to sharp objects.

Transport protection

Some transducers are delivered with a cover plate to protect the face during transport and installation. Let this plate stay on as long as possible, but do not forget to remove it before the vessel goes to sea.

Cleaning and painting the transducer face

During normal use, the transducer is subjected to biological fouling. If this marine growth is excessive, it will reduce the performance of the EK80.

The transducer has not been designed with any protection against biological fouling. Whenever opportunity arise, typically when the vessel is dry-docked, the transducer face must be cleaned for shells and other marine growth.

- Be careful so that you do not accidentally make cuts or inflict other physical damage to the transducer face.
- Remove biological fouling carefully using a plastic brush, a suitable synthetic detergent and fresh water. Biological material which is strongly rooted in the substrate can be removed carefully with a piece of wood or plastic.
- **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer.

Anti-fouling paint may be applied to the transducer face. To minimize the negative acoustical effects the layer of anti-fouling paint must be as thin as possible.

Note

The anti-fouling paint will reduce the acoustical performance of the transducer. The surface roughness of the transducer substrate and the thickness of the paint may also influence the performance. Kongsberg Maritime cannot be held responsible for any negative consequences of the anti-fouling paint.

Approved anti-fouling paints

Because some paint types may be aggressive to the polyurethane in the transducer, consult our list of approved paints. The list can also be found on http://www.simrad.com. Observe the relevant instructions and safety information provided by the paint manufacturer.

Special rules for acoustic windows

Arctic tanks have acoustic windows made of polycarbonate. These must neither be painted nor cleaned with chemicals. Acoustic windows must not be exposed to direct sunlight.

Related topics

Maintaining the EK80, page 341

Approved anti-fouling paints

This is our list of approved antifouling paints for all transducer types. Always refer to the manufacturer's documentation and data sheets for a complete procedure and for relevant safety information.

Important

Do not paint the transducer with traditional hull plating paint. Use only the correct type of approved paint specified.

Do not use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer face.

Jotun

- **Manufacturer**: Jotun
- **Address:** P.O.Box 2021, N-3248 Sandefjord, Norway
- **Manufacturer's website**: http://www.jotun.com

Products:

- SeaQuantum Ultra S
  - **Primer**: Safeguard Universal ES

    Apply 80 µm wet film thickness (50 µm dry film thickness).
  - **Paint**: SeaQuantum Ultra S

    Apply 250 µm wet film thickness (125 µm dry film thickness).
- Seaforce 200 AV
  - **Primer**: Safeguard Universal ES AV

    Apply 70 µm wet film thickness (50 µm dry film thickness).
  - **Paint**: Seaforce 200 AV

    Apply 140 µm wet film thickness (90 µm dry film thickness).

Data sheets and application guides can be downloaded from:

http://www.jotun.com/ww/en/b2b/technical-info/tds/index.aspx

International Marine Coatings

- **Manufacturer**: International Marine Coatings
- **Address:** Stoneygate Lane, Felling, Gateshead, Tyne & Wear, NE10 0JY United Kingdom
- **Manufacturer's website**: www.international-marine.com

Products:

- Intersleek 1100SR

   - **Primer**: Intersleek 737

     Apply 50 µm dry film thickness.
   - **Paint**: Intersleek 1100SR

     Apply 150 µm dry film thickness.
- Intersmooth 7465Si SPC
   - **Primer**: Intergard 269

     Apply 40 µm dry film thickness.
   - **Paint**: Intersmooth 7465Si SPC

     Apply 100 µm dry film thickness.

The list can also be found on http://www.simrad.com.

Related topics

Maintaining the EK80, page 341

Installing and troubleshooting Network Time Protocol (NTP)

NTP (Network Time Protocol) is a network protocol that enables you to synchronize the clocks on devices over a network. It uses one or more *NTP servers* to maintain a highly accurate time, and allows clients to query for this time.When clients query the server they automatically adjust their own internal clocks to mirror the NTP server. These tasks are only applicable for a EK80 system fitted with relevant hardware for acoustic Doppler current profiler (ADCP) functionality.

Installing Network Time Protocol (NTP)

NTP (Network Time Protocol) is a network protocol that enables you to synchronize the clocks on devices over a network. It uses one or more *NTP servers* to maintain a highly accurate time, and allows clients to query for this time.When clients query the server they automatically adjust their own internal clocks to mirror the NTP server. The Network Time Protocol (NTP) application must be installed on the EK80 Processor Unit.

Prerequisites

To download the software you need a computer connected to the Internet.

Context

Installing an Network Time Protocol (NTP) application is a requirement if your EK80 Processor Unit is connected to acoustic Doppler current profiling (ADCP) hardware. The

EK80 requires synchronized reception of the KM Binary datagram. The NTP application ensures that the EK80 and the ADCP hardware are synchronized to the vessel's master clock.

Note

The screen captures are taken from software version 4.2.8. The manufacturer may change these in later releases.

Procedure

1 Open a web browser.

2 Type the following URL in the address field:

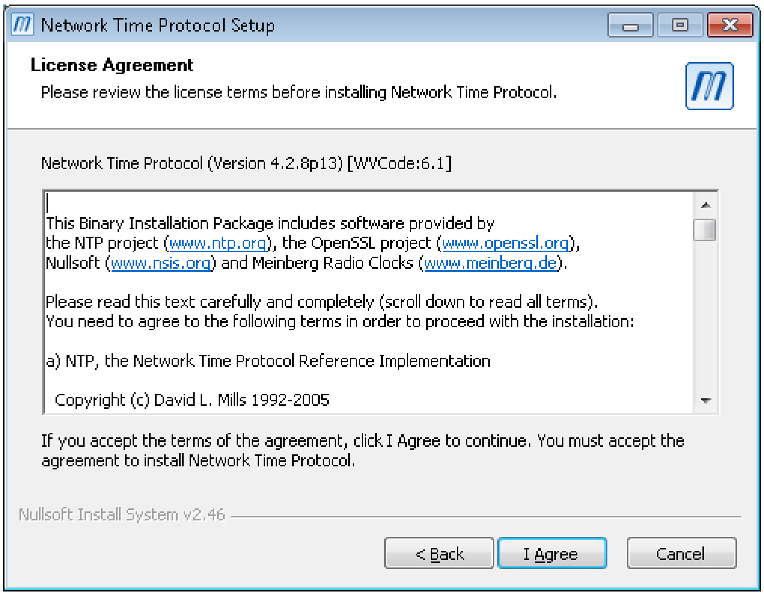
https://www.meinbergglobal.com/english/sw/ntp.htm

3 Download and install the latest release of the NTP application.

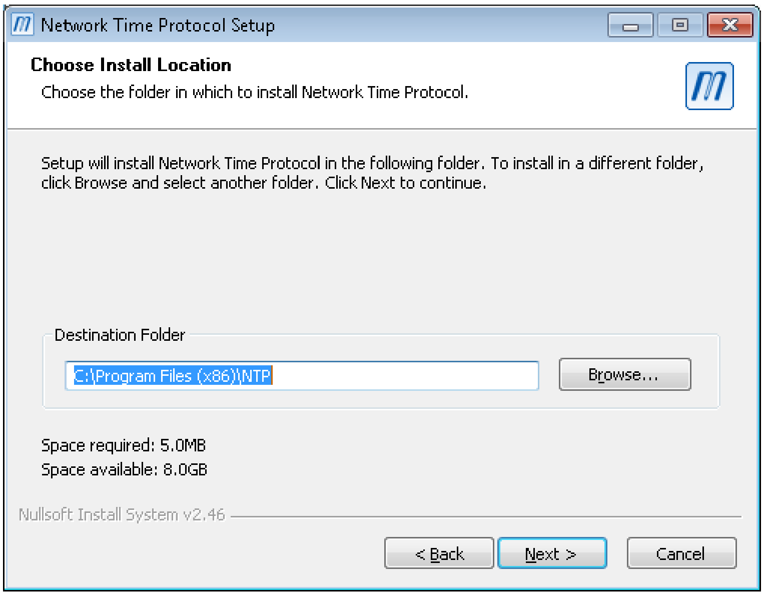
"NTP for Windows XP and newer, with IPv6 support"

Example: ntp-4.2.8p14-win32-setup.exe

4 Select **I agree** for license agreement.

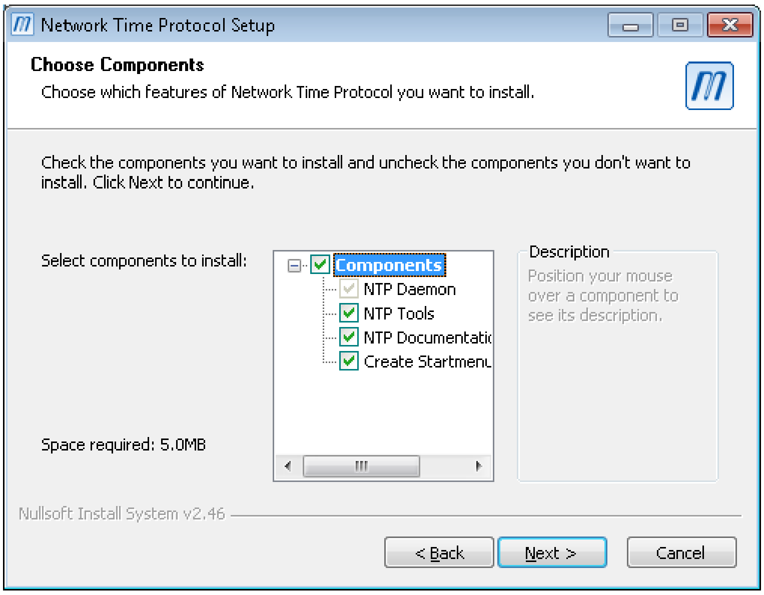


5 Keep the suggested **Destination Folder** for **Installation Location**.



Select **Next** to continue.

6 Select **Installation Components**.

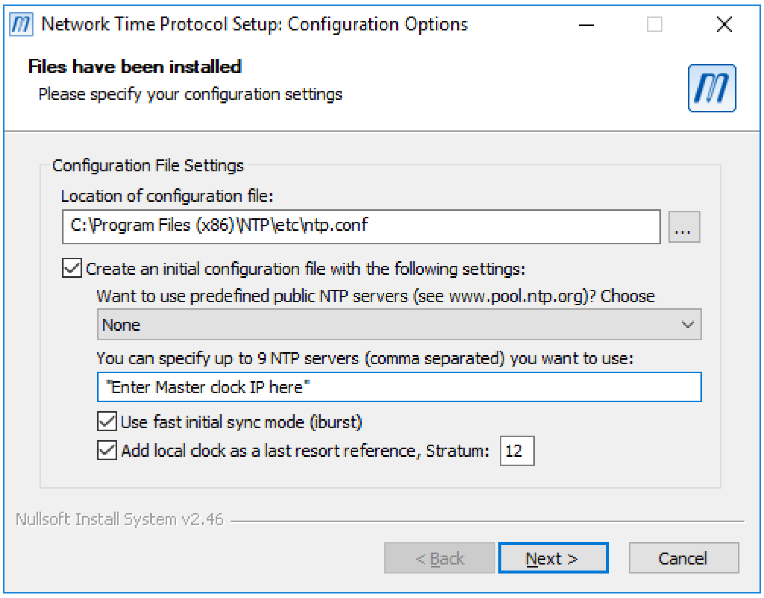


Select the following options by checking the check boxes:

- **NTP Dameon**
- **NTP Tools**
- **NTP Documentation**
- **Create Start menu**

Select **Next** to continue.

7 Select configuration file settings.

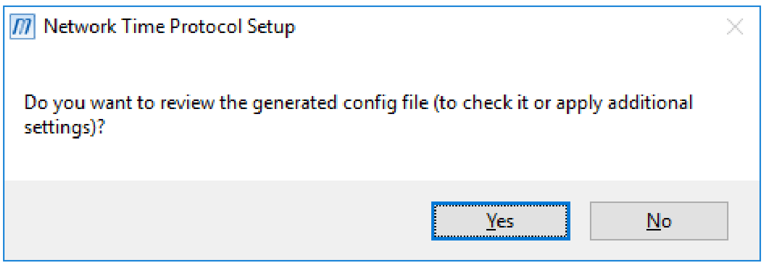


Select the following options by checking the check boxes:

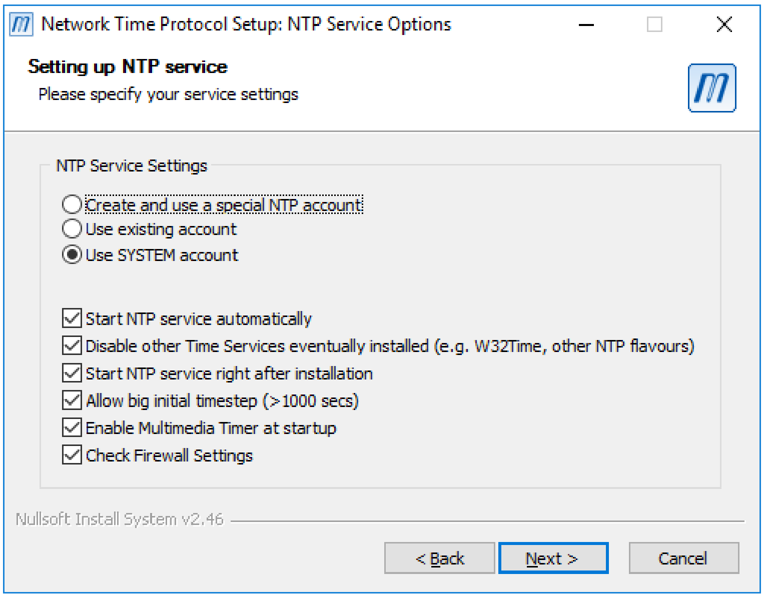
- **Location of configuration file**: `C:\Program Files (x86)NTP\etc\ntp.conf`
- **Create an initial configuration file with the following settings**
- **Predefined public NTP servers: None**.
- **Specify the NTP server IP address: 10.124.24.200**
- **Use fast initial sync mode (iburst)**
- **Add local clock as a last resort reference, Stratum**: 12

Select **Next** to continue.

8 Select **No** for not reviewing the generated config file.



9 Select service settings in the **Setting up NTP service**page.

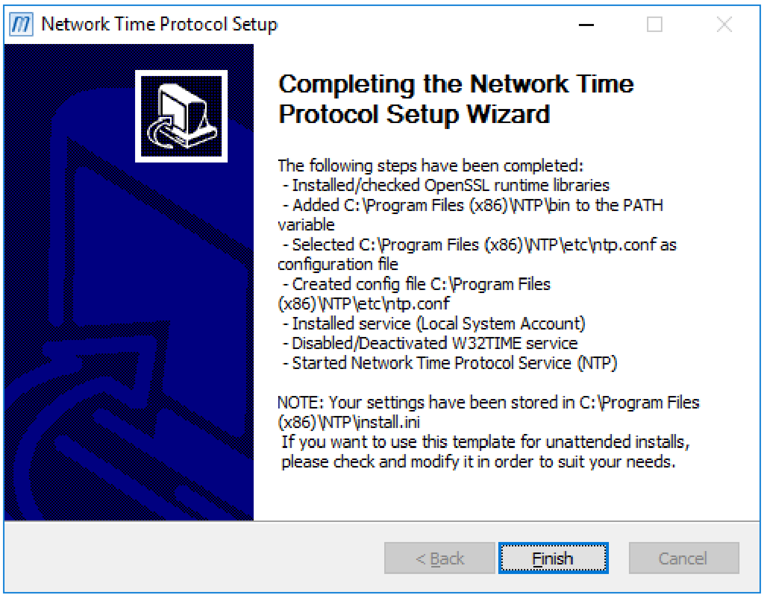


Select the following options by checking the check boxes:

- **SYSTEM account**
- **Start NTP service automatically**
- **Disable other Time Services eventually installed (e.g. W32Time, other NTP flavours)**
- **Start NTP service right after installation**
- **Allow big initial timestep (<1000 s)**
- **Enable Multimedia Timer at startup**
- **Check Firewall Settings**

Select **Next** to continue.

10 Select **Finish** to close the wizard.



Related topics

Installing and troubleshooting Network Time Protocol (NTP), page 360

Installing Network Time Protocol (NTP) monitor

The NTP Server Monitor is a software utility that runs on any Windows platform, workstation or server. It allows any number of NTP time servers to be constantly monitored. Any servers that are operating outside the preset tolerances are highlighted in the user interface.

Prerequisites

To download the software you need a computer connected to the Internet.

Context

The NTP Time Server Monitor allows you to configure and control the local NTP service. The current status of the local NTP service, as well as external NTP services, are displayed.

The NTP Timer server monitor software controls and oversees the NTP Service. It further simplified the handling of the NTP service.

Here is a small list of the abilities and features this tool offers:

- Switch between different configurations (ntp.conf files).
- Change the service settings without the need to open the device manager each time.
- Extract the NTP related application log entries and display them separately in a table.
- Display the current status of the running NTP service.
- The user can configure external NTP server, which are also queried by the NTP time server displayed.
- The configuration file of the NTP service (ntp.conf) can be edited within this program.

https://www.meinbergglobal.com/english/sw/ntp-server-monitor.htm (June 2020)

Note

The screen captures are taken from software version 1.04. The manufacturer may change these in later releases.

Procedure

1 Open a web browser.

2 Type the following URL in the address field:

https://www.meinbergglobal.com/english/sw/ntp-server-monitor.htm

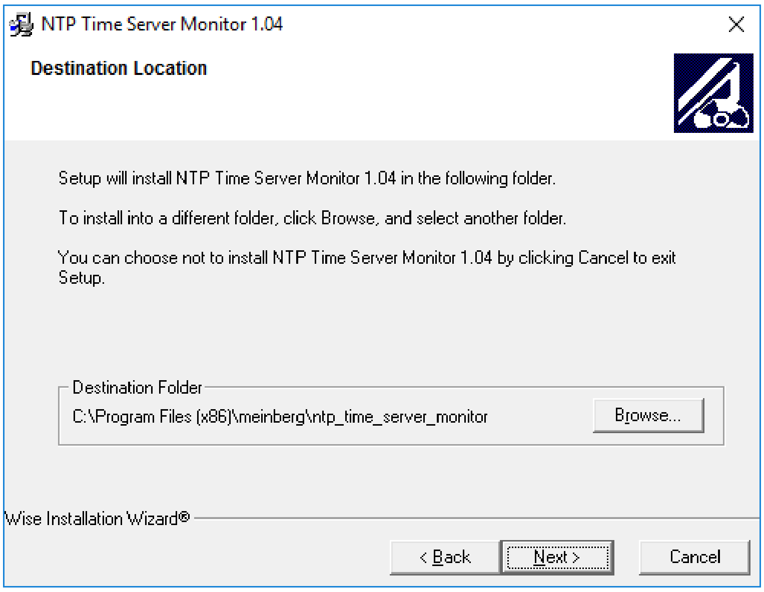
3 Download and install the latest release of the NTP application.

"NTP Time Server Monitor for Windows NT/2000/XP/Server 2003, Server 2008/Vista/7/8"

Example: ntp-time-server-monitor-1.04.exe

4 Select **Destination Folder**

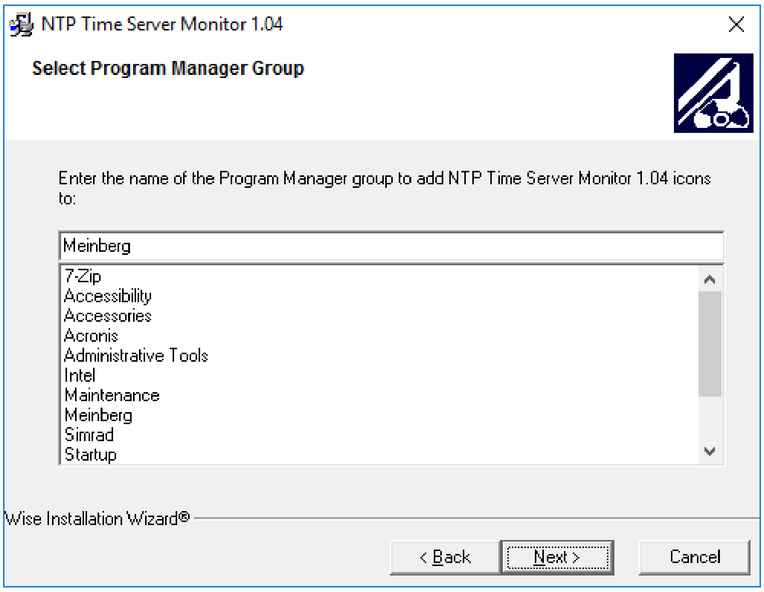
`C:\Program Files(x86)\meinberg\ntp_time_server_monitor`



Select **Next** to continue.

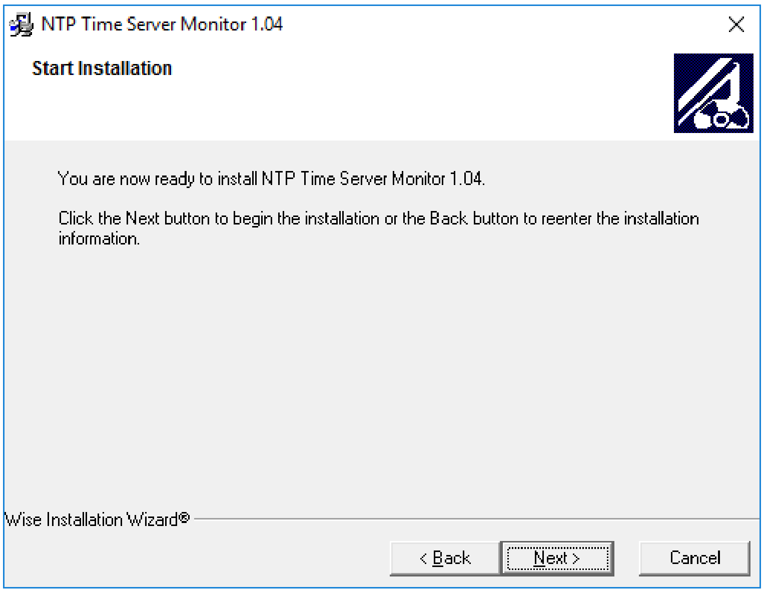
5 Type the name of the **Program Manager Group**.

Meinberg

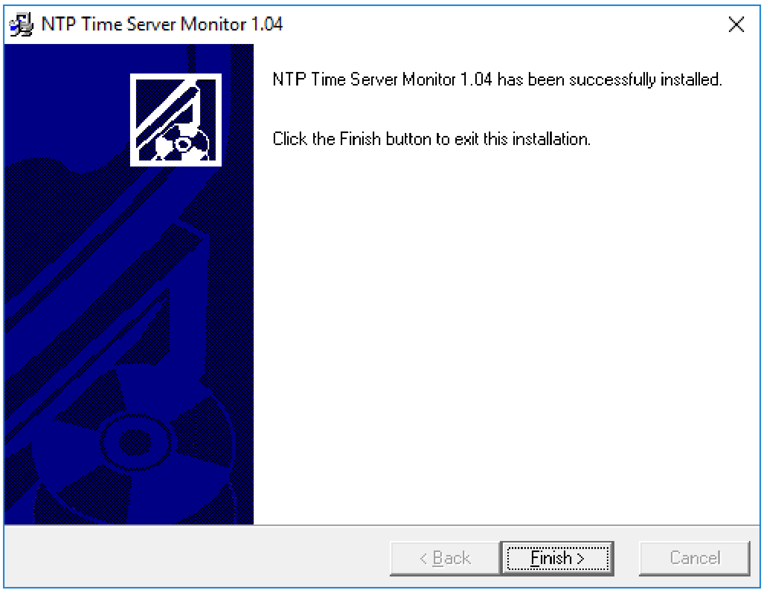


Select **Next** to continue.

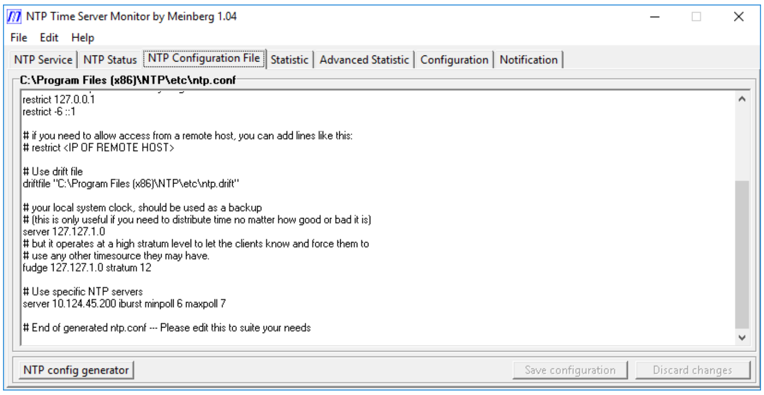
6 Start the installation by selecting **Next**.



7 Select **Finish** to close the wizard.



8 Start **NTP Time Server Monitor** from the desktop.



9 Verify that the NTP service operates normally.

a Make sure that the service is in *Started* mode on the **NTP Service** tab.

b Make sure that the IP addresses and synchronized device are in *OK* mode on the **NTP Status** tab.

c Make sure that the NTP server provides NTP timing signals to the relevant ADCP hardware in the **NTP Configuration File** tab.

- The master clock is found at IP address 10.124.45.200 (example).
- The NTP server will also update the EK80 Processor Unit clock.
- In some cases a motion reference unit (MRU) providing the KM Binary datagram does *not* act as the vessel's master clock. You must then follow the instructions of the MRU manufacturer to synchronize the MRU to the Ship Master clock.

Related topics

Installing and troubleshooting Network Time Protocol (NTP), page 360

Troubleshooting the Network Time Protocol (NTP) service

The Network Time Protocol (NTP) service may in some cases malfunction, or even stop.

Context

The EK80 installation program adds a firewall rule to allow for NTP communication. If the EK80 issues messages related to missing time synchronization between a motion reference unit (MRU) and/or ADCP hardware synchronization, the problem is most likely related to the firewall.

Procedure

1 Check the firewall settings on the Processor Unit.

One reason for NTP synchronisation problems may be a firewall or port filter that inhibit the communication. Check the firewall settings in the Control Panel.

2 Adjust the firewall settings.

3 Check the communication between the EK80 NTP server and the client(s).

Tip

You can use Wireshark (https://www.wireshark.org). This is a network protocol analyser. Wireshark allows you to see your network activities at a microscopic level.

Related topics

Installing and troubleshooting Network Time Protocol (NTP), page 360

Target strength calibration

Topics

Calibration for target strength measurements

In order to maintain the accuracy provided by the Simrad EK80, and required for scientific applications, the system must be calibrated.

We strongly recommend that calibration surveys are done at regular intervals. As a minimum, calibration must be done prior to each survey.

Note

Calibration must be taken seriously. To achieve the best results, the calibration must be planned and done carefully.

A 23 mm calibration sphere for 120 kHz

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly.

In this context, the transducer beam is conically shaped with a cross-section area increasing with the depth. The cross-section is divided into "slices", and each slice represents a sector in the transducer. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

Any adjustments to the EK80are done automatically by the calibration program. No gain adjustments are required.

Note

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process. To select Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

If you have a EK80 system with several transceivers, you must calibrate one by one.

- If you add a new transducer to a previously calibrated EK80 system, this new channel must be calibrated.

- If a calibrated transducer is moved from one transceiver to another, you must still calibrate the transducer on the "receiving" transceiver.
- If a calibrated transducer is removed, and then later reconnected to the same transceiver, the calibration data exist. A new calibration is not required.

A new calibration may also be required after an update of the EK80 software. Refer to the software release note.

The information provided by the calibration is entered into the EK80 software as operational parameters. This is done automatically.

Tip

We recommend that you calibrate the EK80 in calm sea.

In rough sea with heave compensation activated, the calibration sphere will move up and down in the echogram. This is because the sphere follows the vessel motions, while the EK80 attempts to compensate for the same motions. In order to detect the sphere, you may even need to expand the depth limitation.

You can suppress the heave compensation by disabling the input from the sensor. However, this will remove the heave compensation information from the raw data that you record. It will then be missing if you wish to assess the calibration later using the replay functionality.

---

s_A correction

The sA correction is only calculated for CW transmissions.

- When calibrating a Wide Band Transceiver (WBT), the effective pulse duration is calculated and used to establish the sA correction. This will normally result in a sA correction around 0 dB.
- When calibrating a General Purpose Transceiver (GPT), the sA correction is based on the nominal pulse duration. This will normally result in a slightly negative sA correction.

Calibration spheres

Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies. Each sphere diameter is selected for minimum temperature dependence.

Frequency (kHz)	Copper	Part number
18	63 mm	SRT-073512
38	60 mm	SRT-073514
70	32.1 mm	SRT-073517

Frequency (kHz)	Copper	Part number
120	23 mm	SRT-088098
200	13.7 mm	SRT-073519

Frequency (kHz)	Tungsten carbide	Part number
38	38.1 mm	337897
70	38.1 mm	337897
120	38.1 mm	337897
200	38.1 mm	337897
333	22 mm	337511
-	25 mm	364507
Each tungsten carbide sphere must have a cobalt binder.		

Note

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Target strength calibration summary

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly. A summary of the target strength calibration process is provided.

Prerequisites

In order to calibrate the EK80, the following equipment is required.

- Calibration spheres: The calibration spheres must be chosen to match the operational frequencies used by the EK80 system.
- Winch arrangement: The winch arrangement must provide the necessary lines to lower the sphere into the sound beam.

The vessel must be anchored in a suitable position with sufficient depth, calm and sheltered water, and minimum sea currents.

Note

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies. Each sphere diameter is selected for minimum temperature dependence.

Procedure

1 Prepare the vessel for EK80 calibration.

Preparing the EK80 for calibration, page 376

Preparing the vessel for EK80 calibration, page 378

2 On the **Operation** menu, set **Operation** to *Normal*.

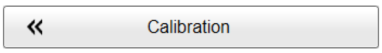
3 In the **Normal Operation** dialog box, set up the operating parameters for the channel you wish to calibrate.

Starting the target strength calibration, page 379

4 Lower the sphere into the beam at the specified depth. Verify that the echoes are clearly detected.

5 On the **Operation** menu, open the **Record RAW** button, and select *On*.

6 On the **Setup** menu, select **Calibration**.



7 On the first page of the wizard, select **New calibration from raw data (Real time or Replay)**.

Starting the target strength calibration, page 379

8 Select **Next** to continue.

9 On the *second* page of the wizard:

a Select the channel to be calibrated.

The sphere parameters can be modified in the **Calibration Wizard** dialog box page 3.

b Select **Next** to continue.

Starting the target strength calibration, page 379

10 On the *third* page of the wizard:

Select the sphere to use in target strength calibration. You can also add a new sphere if it is not listed.

11 On the *fourth* page of the wizard:

a Make the necessary preparations to record calibration data.

b Select **Start** to start echo data import.

c When the appropriate number of echoes have been imported, select **Stop**.

d Stop the recording.

e Select **Save** or **Save As** to save the calibration data.

f Select **Next** to continue.

Importing the echo data, page 381

12 On the *fifth* page of the wizard:

a Remove the echoes you do not wish to use in the calibration.

b Select **Reprocess** to run the calibration processing.

c Select **Save** or **Save As** to save the calibration data.

d Update the calibration used by the echo sounder using **Merge** or **Replace**.

Processing the echo data, page 385

13 Stop raw data recording.

14 Close the **Calibration Wizard** dialog box, and resume normal operation.

Further requirements

Repeat the procedure for each channel you wish to calibrate.

Related topics

Basic operation, page 44

Calibration procedures

Topics

Preparing the EK80 for calibration

Prior to calibration, you must check that your EK80 is fully functional.

Context

A fully functional EK80 system is vital for a successful calibration. It is necessary to measure the environmental conditions before the calibration starts.

Procedure

1 Start the EK80.

   a Check that the EK80 and all the transceivers and transducers are installed correctly.

   b Set **Operation** to *Normal*.

   c Start "pinging".

   d Verify that the EK80 is fully operational on all channels.

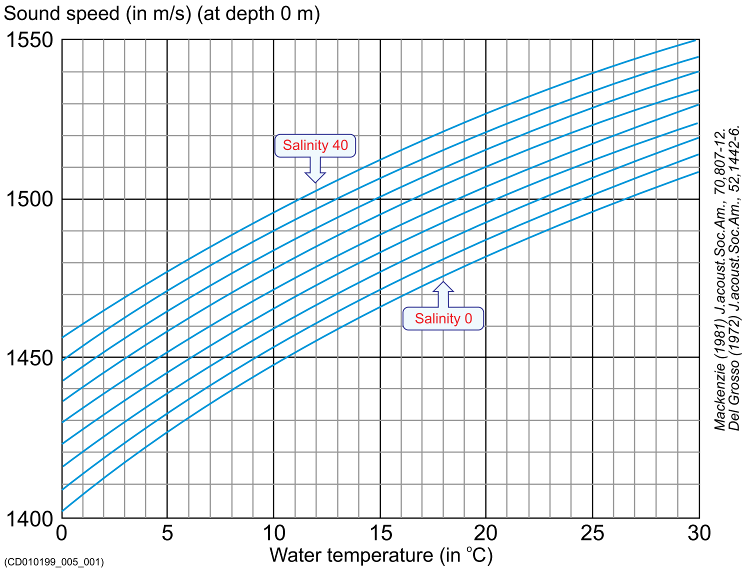
2 Measure the water salinity and temperature between the transducer and the planned depth of the calibration sphere.

3 Calculate the average salinity and temperature values, and type these into the **Environment** dialog box.

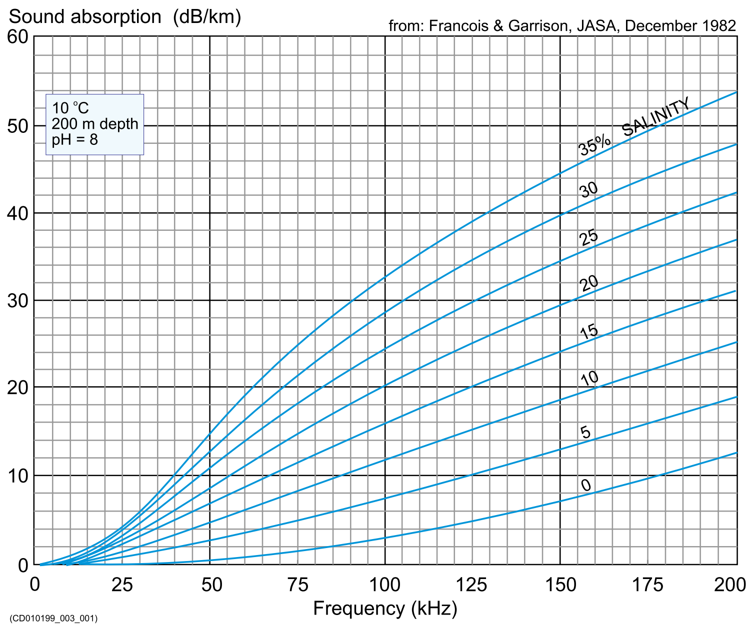
   The sound velocity is automatically calculated by the EK80. The corresponding absorption coefficient is calculated by the echo sounder according to *Francois & Garrison, JASA December 1982*.

Note

When you calculate the target strength (TS), you must use the sound velocity at the depth of the sphere.



Sound speed in water for different salinity values

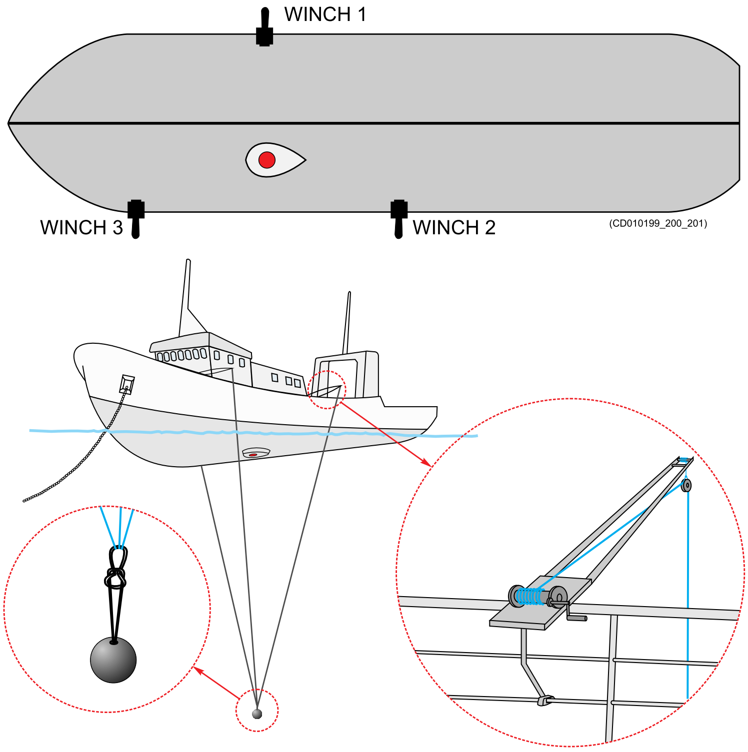


Sound absorption for different salinity values

Preparing the vessel for EK80 calibration

Prior to calibration, a suitable geographical location must be found. The necessary equipment for lowering, hoisting and handling the target sphere must be set up. The rigging description is to a great extent reproduced from *ICES report 144*.

Context



It is desirable to work in water as deep as possible. You must maintain a stable platform. Both bow and stern anchoring or mooring is strongly recommended.

Set up winches to guide and steer the lines to the sphere. You need to move the sphere within the beam, so the length of the individual wires must be easily adjustable. Mount the winches to the deck railing in accordance with the transducer location. Each winch must be provided with a long spool of 0.60 mm diameter monofilament nylon line. The lines must be marked with small swivels at 5 m intervals, beginning 10 m from the loose end.

The purpose of the swivels is threefold:

- They will unravel rotation of the nylon line
- They will mark distances on the line
- They will add weight so that the line sinks in water

Note

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Procedure

1 Locate a suitable geographical area for the calibration.

a Find a location with calm and sheltered water.

b Avoid areas with large differences in tidal height, as this gives strong tidal current.

c Avoid areas near river mouths and harbours with heavy traffic.

d Try to find an area with little or no fish present.

2 Ensure that the depth is sufficient for clear separation of sphere and bottom echoes.

3 Anchor the vessel.

Note

If the vessel is anchored or moored only fore or aft, the wind will cause it to drift sideways. If the current then attacks with a different angle, it will make a bad situation even worse. If the vessel is allowed to move sideways, or if the current runs abeam, this will normally give larger variations in the EK80 performance. This results in poor and not reliable calibration accuracy.

4 Pull a rope beneath the hull from one side of the vessel to the other.

5 Place the first winch in the transverse plane of the vessel running through the transducer.

If the transducer is mounted on one side of the keel, place the first winch on the opposite side of the vessel.

6 Place the second and third winches on the same vessel side as the transducer and at equal distances from the transverse section containing the transducer and first winch.

Starting the target strength calibration

The EK80 calibration is started by recording raw data from the sphere.

Prerequisites

In order to calibrate the EK80, the following equipment is required.

- Calibration spheres: The calibration spheres must be chosen to match the operational frequencies used by the EK80 system.
- Winch arrangement: The winch arrangement must provide the necessary lines to lower the sphere into the sound beam.

The vessel must be anchored in a suitable position with sufficient depth, calm and sheltered water, and minimum sea currents.

Context

The **Calibration Wizard** offers a series of dialog boxes to guide you through the calibration process.

1 The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.

2 The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.

3 The third page in the **Calibration Wizard** allows you to choose which calibration target (sphere) that is used. You can also add or delete spheres, and modify the parameters.

4 The fourth page in the **Calibration Wizard** allows you to import the echo data into the calibration process. You can make changes to the single target detection, and add a brief description, but you are not permitted to do anything with the echo data.

5 The fifth page in the **Calibration Wizard** allows you to manually "clean" the echo data before you process it to calibrate the EK80. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Note

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process.

This procedure guides you through the first two pages in the **Calibration Wizard** dialog box.

Procedure

1 In the **Output** dialog box, select **File Setup**.

2 On the **File Setup** page, define the relevant file and folder properties.

   Note

   We strongly recommended that you always store the raw data from the calibration. Set up the file and folder parameters before you start the recording.

   Use the file name to identify the your physical location, the frequency used, which calibration sphere that is used, and the pulse form. Information about the data and time of the recording is automatically added to the file name.

3 Lower the sphere into the beam at the specified depth.

4 In the **Normal Operation** dialog box, set up the operating parameters for the channel you wish to calibrate.

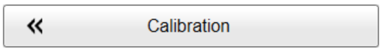
5 Start "pinging".

   a Set **Operation** to *Normal*.

   b Set **Ping Mode** to *Interval*.

   c Set **Ping Interval** to *1000 ms*.

6 On the **Setup** menu, select **Calibration**.



7 On the first page of the wizard, select **New calibration from raw data (Real time or Replay)**.

8 Select **Next** to continue.

9 On the *second* page of the wizard:

The sphere parameters can be modified in the **Calibration Wizard** dialog box page 3. You can also add a new sphere if it is not listed.

10 Select **Next** to continue.

Further requirements

Proceed to the third page in the **Calibration Wizard**.

Importing the echo data

The fourth page in the **Calibration Wizard** allows you to import the echo data into the calibration process. You can make changes to the single target detection, and add a brief description, but you are not permitted to do anything with the echo data.

Prerequisites

In order to import echo data, the EK80 must be "pinging" with a calibration target (sphere) inside the beam.

Context

The fourth page of the **Calibration Wizard** dialog box is divided into three fields.

Tip

To change the size of the individual field, click and drag the field borders. You can also increase the size of the dialog box. To make the dialog box cover the entire screen, double-click the title bar.

- **Target Position field**

  The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The right side of the field shows the calibration layer that is automatically created once the calibration starts.

- **Frequency/Target Strength field**

  The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. This is the same curve as you can see in the **Calibration Wizard** dialog box page four, but with a few additional features.

- **Numerical field**

  The *Numerical* field provides several tabbed pages. The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. The page also provides a visual presentation of the coverage. The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data. The **TS Data** page displays the numerical parameters related to each individual echo.

Procedure

1. Adjust the size of the **Calibration Wizard** dialog box so that you can also see the echogram.
2. If necessary, adjust the calibration layer.

   When the calibration process is started, a dedicated layer is automatically created. If a strong and easily detected echo from the calibration sphere is shown in the echogram, the layer will position its borders over and under the target. During the calibration process, the calibration layer must be monitored and adjusted to compensate for the target's depth changes.
3. In the *Frequency/Target Strength* field, verify that the calibration target (sphere) is useful for the chosen frequency range.

   Due to their unique characteristics, the various calibration spheres offer different target strengths when the frequency changes. This is clearly seen when you calibrate in FM using a larger frequency band. If the shape of the curve shows significant differences in the target strength, the calibration using the related frequency band(s) will be inaccurate.
4. If necessary, change the **TS Deviation** to a lower numerical value than the default setting.

   This setting is located on the **General** page in the *Numerical* field. The **TS Deviation** setting allows you to control the maximum permitted deviation for the echoes from the calibration target (sphere). Echoes outside the defined limit are not imported. The limit you select is shown in the *Frequency/Target Strength* field. Reducing the numerical value of the **TS Deviation** setting may be useful to filter out echoes from other targets than the sphere.
5. If necessary, adjust the **Min Depth** and/or the **Max Depth** settings.

   These settings are located on the **General** page in the *Numerical* field. Use these parameters to adjust the depth limits of the calibration layer, thus creating a "depth window". Echoes from objects outside the defined limits are not imported. You must lower the sphere to a known depth. If you manage to *keep* the sphere at this depth when is moved in the beam during the calibration, you can adjust the calibration layer to make a smaller "depth window". This removes unwanted echoes.

6 Select **Calibration Description** to open the dialog box.

The **Calibration Description** dialog box allows you to record information about your current calibration operations. You can type in any kind of relevant information into the **Calibration Description** text field. This can be for example the vessel's location, weather conditions, or the name of the people who did the calibration.

The information you type is added to the XML file with the calibration data. The date and time of the calibration are automatically added to the XML file names. The **Calibration Description** dialog box also shows you the serial number of the transducer that is used on the channel that is calibrated, as well as the name of the channel you are calibrating. This information is retrieved automatically.

7 Select **Single Target Detection** to check the settings.

Tip

Set the **Minimum Threshold** *to about 10 dB below the nominal target strength of the calibration sphere. The remaining default values are acceptable for most purposes.*

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8 On the **Operation** menu, open the **Record RAW** button, and select *On*.

9 Select **Start** to start echo data import.

a During the data import, use the three winches to move the sphere inside the sound beam.

This can be done by adjusting the length of the winch wires in a programmed pattern.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. Several echoes on "top" of each other do not increase the calibration accuracy, but the distribution of the echoes within the beam does. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

Tip

We have seen that some customers use automatic winches. These are controlled by a software program which methodically places the sphere in the different sections of the beam while maintaining the same depth.

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b During the data import, monitor the coverage.

The **General** page in the *Numerical* field presents both numerical and a visual presentation of the coverage. The area covered by the transducer beam is shown as a circle with "slices" for each transducer sector. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

The coverage circle uses colour coding to show you the current coverage.

- Red colour means that you do not have enough echoes in the relevant sector (0 to 25%).
- Yellow colour means that you have many echoes in the relevant sector, but not enough (25 to 50%).
- Green colour means that you have enough echoes in the relevant sector for a successful calibration (better than 50% coverage).

A small circle in the middle represents the coverage in the centre of the beam. It uses the same colour coding. The numerical values for the center and overall coverage are shown over the coverage circle.

c During the data import, monitor the calibration layer, and adjust if required.

During the calibration process, the calibration layer must be monitored and adjusted to compensate for the target's depth changes. These depth changes are easy to see in the echogram, or on the right side of the *Target Position* field.

The depth limits of the calibration layer can be adjusted in three different ways:

- You can select a red line in the echogram, and drag it up or down.
- You can select a red line on the right side of the *Target Position* field, and drag it up or down.
- You can adjust the **Min Depth** and **Max Depth** settings on the **General** page in the *Numerical* field.

10 When the appropriate number of echoes have been imported, select **Stop**.

11 Stop the recording.

12 Stop "pinging".

13 Select **Save** or **Save As** to save the calibration data.

You must save the calibration data before you continue to page four in the **Calibration Wizard** dialog box. You are not saving raw echo data here, but an XML file that contains the information necessary to run the calibration process.

14 Select **Next** to continue.

Further requirements

Proceed to the fourth page in the **Calibration Wizard**.

Processing the echo data

The fifth page in the **Calibration Wizard** allows you to manually "clean" the echo data before you process it to calibrate the EK80. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Prerequisites

In order to process echo data for calibration, you must have imported and saved valid echo data from a relevant calibration target (sphere) inside the beam.

Context

The fourth page of the **Calibration Wizard** dialog box is divided into three fields.

Tip

To change the size of the individual field, click and drag the field borders. You can also increase the size of the dialog box. To make the dialog box cover the entire screen, double-click the title bar.

- **Target Position field**

  The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The right side of the field shows the calibration layer that is automatically created once the calibration starts.

- **Frequency/Target Strength field**

  The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. This is the same curve as you can see in the **Calibration Wizard** dialog box page four, but with a few additional features.

- **Numerical field**

  The *Numerical* field provides several tabbed pages.

  - The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. The page also provides a visual presentation of the coverage.
  - The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data.
  - The **TS Data** page displays the numerical parameters related to each individual echo.
  - The **Results** page displays the numerical parameters that are created by the calibration processing.
  - The **Error Analysis** page displays all the individual echoes that are imported into the calibration program.

Procedure

1 Open the **TS Data** page in the *Numerical* field to access the individual echoes.

2 Remove the echoes you do not wish to use in the calibration.

   a Click at the top of each column so sort the table.

   b In the **Suspended** column, select individual echoes to remove them from the processing.

3 Open the **Error Analysis** page in the *Numerical* field to identify errors.

4 Identify echoes that are too strong or too weak.

   a Investigate the echoes by adjusting the colour scale.

   b Open the **TS Data** page in the *Numerical* field to access the individual echoes.

   c Remove the echoes you do not wish to use in the calibration.

5 Select **Reprocess** to run the calibration processing.

6 Finalize the calibration process.

   a Select **Finish**.

   b Select **Save** or **Save As** to save the calibration data.

   c Update the calibration used by the echo sounder using **Merge** or **Replace**.

   These options are not valid for CW calibration. In CW, several sets of calibration values are saved, one for each pulse duration.

   When you calibrate with FM pulses, use **Merge** or **Replace** as follows:

   - Use **Merge** if you are calibrating with more than one sphere. This will cover the entire frequency range of the transducer. Used together, these spheres will provide you with a wider frequency band, and the calibration results are merged.
   - Use **Replace** to remove all old calibration results. This allows you to only use the latest parameters for the relevant channel.

   In FM, one single set of calibration values is saved, and this set covers all pulse durations.

   d Close the **Calibration Wizard** dialog box, and resume normal operation.

Selecting Normal Operation parameters for target strength calibration

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements. The parameters for each channel must be defined before the calibration starts.

Context

Each parameter must be defined to match the properties of the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Note

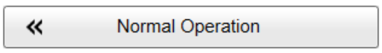
When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process.

If you have a EK80 system with several transceivers, you must calibrate one by one.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 In the **Normal Operation** dialog box, set the operating parameters.

a For the relevant channel, set **Pulse Type** to *FM* or *CW* as permitted by your transducer.

b Set **Pulse Duration** to your chosen value.

c Set **Power** to the correct power level for the transducer.

d Set **Start Frequency** and **End Frequency** to values permitted by your transducer.

e Set **Ramping** to *Fast*.

4 Select **OK** to save the selected setting and close the dialog box.

Defining the file and folder settings for raw data recording

The EK80 allows you to record both raw and processed echo data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 On the **File Setup** page, define the recording parameters.

a Define the output directory for the recorded files.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.

b Define a file name prefix.

By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey.

c Define the maximum amount of bytes to be contained in one data file.

Select **Maximum** for 1 GB file size.

The current size of the RAW data file is displayed during data recording. If the current file size gets too big during recording, select **Split File** on the **Record RAW** button. **Record RAW** is located on the **Operation** menu.

d Specify the raw data recording parameters.

The **Range** setting defines the vertical or horizontal distance from where the echo presentation starts to the end of the search area.

- Select **Common** to use the same recording range for all your active channels.
- Select **Auto** to allow the EK80 to automatically find the required range value.
- Select **Individual** to use the different recording ranges for your active channels.

The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

- Select **Complex samples** to use the default data format.
- Select **Power/Angle** to reduce the file sizes.
- Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

The **Motion Data Recording** function allows you to control how often the motion data are saved in the raw data file.

5 At the bottom of the page, select **Apply** to save your settings.

6 Select **OK** to close the dialog box.

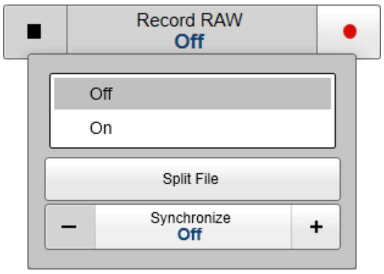
Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Recording raw data during calibration

Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. You can save the data to the Processor Unit hard disk, or onto an external storage device. If your Processor Unit is connected to a local area network, you can also save to a network disk. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record RAW** function.

Prerequisites



Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page. The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

Procedure

1 Open the **Operation** menu.

2 To start data recording, open the **Record RAW** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

The **Record** indicator on the top bar changes its colour to reflect that recording is active.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

3 If you wish to reduce the size of the data file you are recording, click the middle of the **Record RAW** button to open it, and select **Split File**.

The current file is closed, and a new file is automatically started.

4 To stop recording, open the **Record RAW** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Choosing which raw data file(s) to replay

Every time you record echo data, the information is stored on the Processor Unit hard disk. Depending on your initial settings, the files may also be stored on a USB hard disk or even a network disk. The echo data files can be retrieved, and played back on the EK80.

Context

All playback is controlled by the replay bar.

A *__Stop__: Select this button to stop the playback. The replay bar is not removed from the presentation until you select another operating mode.*

B *__Play/Pause__: Select this button to start the playback, or to pause it.*

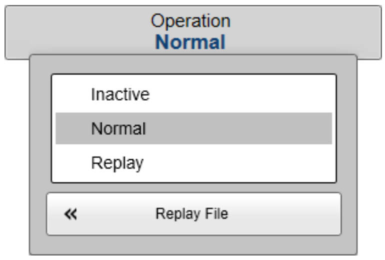
C *__Replay Speed__: Select this slider and move it sideways to adjust the replay speed.*

D *__Replay File__: The button shows you which file you are replaying. Select the button to open the __Replay File__ dialog box.*

E *__Elapsed Time__: This is the elapsed time of the replay sequence.*

F *__Playback Progress__: This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.*

Procedure



1 Open the **Operation** menu.

2 Select **Operation** to see the available choices.

3 Select **Replay File** to open the dialog box.

The **Replay File** dialog box allows you to choose which file(s) to play back. The file names were generated automatically during recording, and each file is identified with the time and date it was made.

4 Select **Add** to choose a replay file.

A standard operating system dialog box is used to locate and select the files you wish to use.

5 If you wish to replay the selected files in an "endless" loop, select **Loop**.

6 If you wish to create index files for the selected files, select **Check for missing index files**.

During raw file recording, the EK80 automatically creates index files to allow for easier navigation in the replay files. On old files, however, these index files are not present. If you activate the **Check for missing index files** function, the index files are created on the selected files before playback starts.

Note

Creating index files can take a long time if you have many or/and large replay files, or if the files are stored on a network server.

7 Select **OK** to save the selected settings and close the dialog box.

8 Set **Operation** to *Replay*.

The replay bar opens automatically. It is positioned directly below the top bar at the top of the EK80 presentation.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Modifying, adding and removing a frequency band

The calibration sphere you use is a key item for a successful calibration. For the currently selected sphere, the **Calibration Wizard** page four presents a curve that shows the relationship between the operational frequency and the sphere's target strength. You can remove one or more frequency bands from the calibration processing. This is done by defining "stop bands". The EK80 is *not calibrated* for the frequencies inside the chosen frequency band.

Prerequisites

In order to manually add or remove a sphere frequency band, the sphere must be registered in the EK80 calibration software. If necessary, click **Add Sphere** in the **Calibration Wizard** dialog box page 3 to import a new sphere.

Context

Calibration spheres are provided in different sizes to fit different operational frequencies. They are also manufactured from different materials, mainly Copper (Cu) and Carbide (TC). The latter is also referred to as Wolfram carbide (Wo-Co). "Co" is short for Cobalt, which is used as binder in the sphere.

For the currently selected sphere, the **Calibration Wizard** page four presents a curve that shows the relationship between the operational frequency and the sphere's target strength. The shape of the curve tells you if the characteristics of the selected sphere disqualifies it from use within specific frequency bands due to low target strength. The functionality of the curve allows you to adjust the frequency band(s), while the **Add Inhibited Band** and **Remove Inhibited Band** buttons allow you to define upper and lower frequencies for which the calibration can take place.

Tip

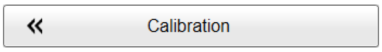
National Oceanic and Atmospheric Administration (NOAA) provides a web based sphere target strength calculator on the following URL: http://swfscdata.nmfs.noaa.gov/AST/SphereTS

Procedure

1 Select the **Setup** icon.

The icon is located under the **Main** menu. It is used to open the **Setup** menu.

2 On the **Setup** menu, select **Calibration**.



3 On the first page of the wizard, select **New calibration from raw data (Real time or Replay)**.

4 Select **Next** to continue.

5 Select Channel

6 Select **Next** to continue.

7 Select **Add Sphere Remove Sphere** or **Modify Sphere** to open the **Add/Edit Sphere** dialog box.

8 Make the necessary adjustments.

a Select **Add Inhibited Band**, then select a spot on the curve to add a frequency band to the TS/Frequency curve.

b Select **Remove Inhibited Band**, then select a band on the curve to delete it from the TS/Frequency curve.

c To modify an existing frequency band, click either side of the rectangular area, hold the mouse button depressed, and move the cursor sideways.

9 Select **OK** to save the chosen settings.

Calibration functions and dialog boxes

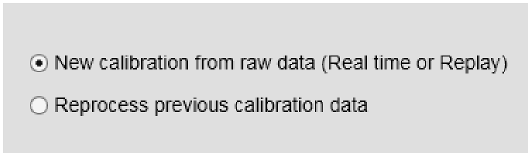
Topics

Calibration Wizard dialog box #1 (Start)

The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.

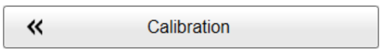
Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.



How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



Description

The following options are provided.

- **New calibration from raw data (Real time or Replay)**: Select this option when you wish to start a new calibration process from scratch. You can either use "live data" for the calibration, or data that are previously recorded.

  It is possible to calibrate the EK80 using recorded data instead of live data. We recommend that you use live data, as this allows you to monitor the echoes in the beam while importing the data. If you wish to restart the whole calibration process later, you can use the raw data recording made during the calibration.

- **Reprocess previous calibration data**: Select this option when you have a previous calibration XML data file available for the calibration.

If you add a new transducer to a previously calibrated EK80 system, this new channel must be calibrated. If a calibrated transducer is moved from one transceiver to another, you must still calibrate the transducer on the "receiving" transceiver. If a calibrated transducer is removed, and then later reconnected to the same transceiver, the calibration data exist. A new calibration is not required.

Related tasks

Starting the target strength calibration, page 379

Importing the echo data, page 381

Processing the echo data, page 385

Related dialog boxes

Calibration Wizard dialog box #1 (Start), page 394

Calibration Wizard dialog box #2 (Select Channel), page 395

Calibration Wizard dialog box #3 (Select Sphere), page 396

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #5 (Process Data), page 407

Calibration Wizard dialog box #2 (Select Channel)

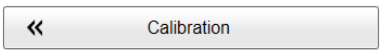
The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

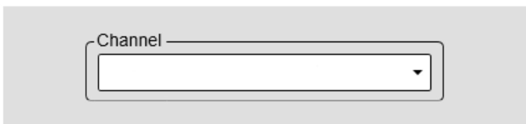
How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**.

Description



Select channel for calibration.In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.The velocity measurement channels are by default named “ADCP”. Target strength measurement channels are named ES -Echo Sounder. The same transducer can be used for both purposes, however be sure to select the right type of channel for calibration in accordance with operation.

Important

Velocity measurement calibration is always performed using replay data or reprocessing of calibration data.

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to *Passive* mode. You must do this *before* you start the calibration process. To select *Passive* mode, use the **Normal Operation** dialog box. The **Normal Operation** dialog box is located on the **Operation** menu.

If you calibrate with previously recorded echo data, the channel identification is recorded as a part of the raw data. You must still make sure that the correct channel is used.

Related tasks

Starting the target strength calibration, page 379

Importing the echo data, page 381

Processing the echo data, page 385

Related dialog boxes

Calibration Wizard dialog box #1 (Start), page 394

Calibration Wizard dialog box #2 (Select Channel), page 395

Calibration Wizard dialog box #3 (Select Sphere), page 396

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #5 (Process Data), page 407

Normal Operation dialog box, page 572

Calibration Wizard dialog box #3 (Select Sphere)

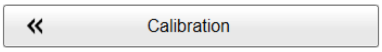
In the third page of the **Calibration Wizard** you choose the calibration target (sphere). You can also add or delete spheres, and modify the parameters.

Prerequisites

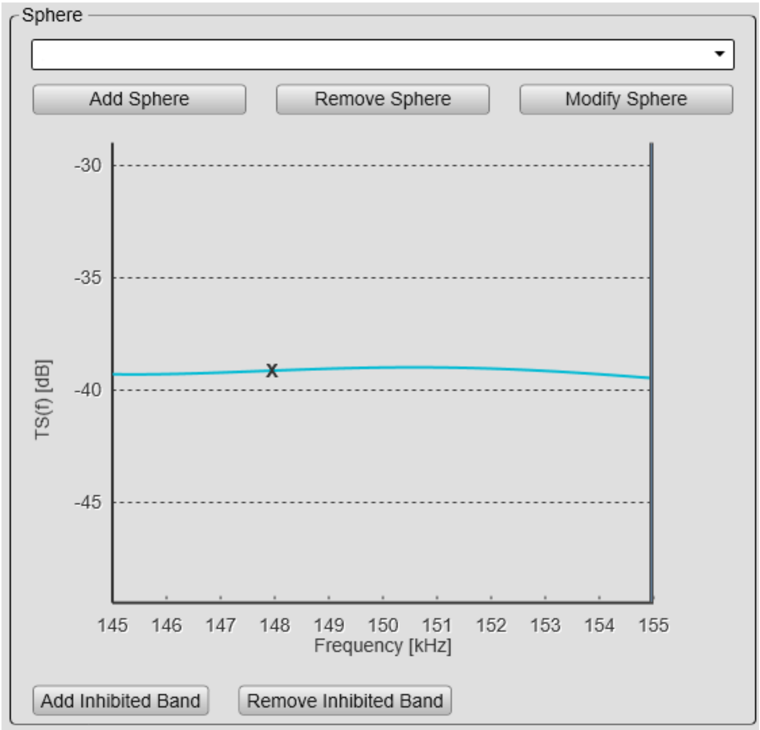
The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* page of the **Calibration Wizard** dialog box, select the channel to calibrate and select **Next** at the bottom of the page.This opens page 3.



Description

Calibration spheres are provided in different sizes to fit different operational frequencies. They are also manufactured from different materials, mainly Copper (Cu) and Carbide (TC). The latter is also referred to as Wolfram carbide (Wo-Co). "Co" is short for Cobalt, which is used as binder in the sphere.

For the currently selected sphere, the **Calibration Wizard** page four presents a curve that shows the relationship between the operational frequency and the sphere's target strength. The shape of the curve tells you if the characteristics of the selected sphere disqualifies it from use within specific frequency bands due to low target strength. The functionality of the curve allows you to adjust the frequency band(s), while the **Add Inhibited Band** and **Remove Inhibited Band** buttons allow you to define upper and lower frequencies for which the calibration can take place.

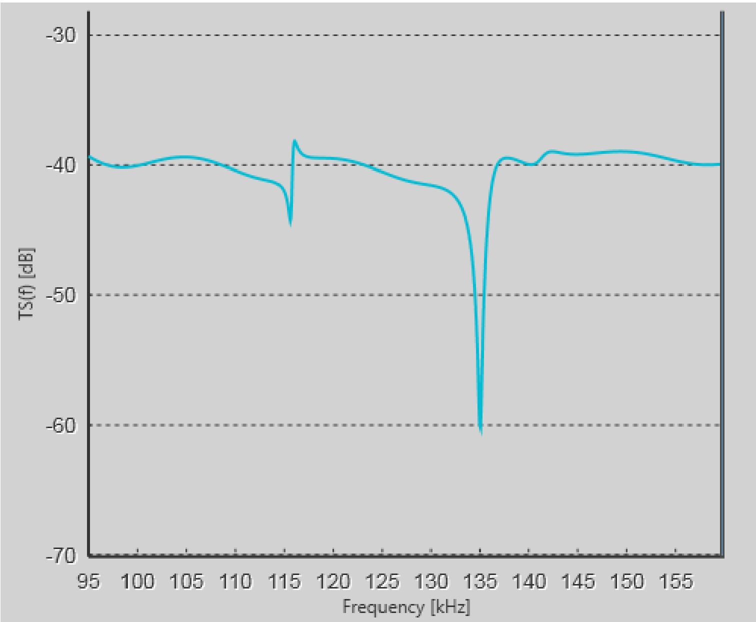
Tip

To add or edit spheres, and to control their operative parameters, see the **Add/Edit Sphere** *dialog box.*

National Oceanic and Atmospheric Administration (NOAA) provides a web based sphere target strength calculator on the following URL: http://swfscdata.nmfs.noaa.gov/AST/SphereTS

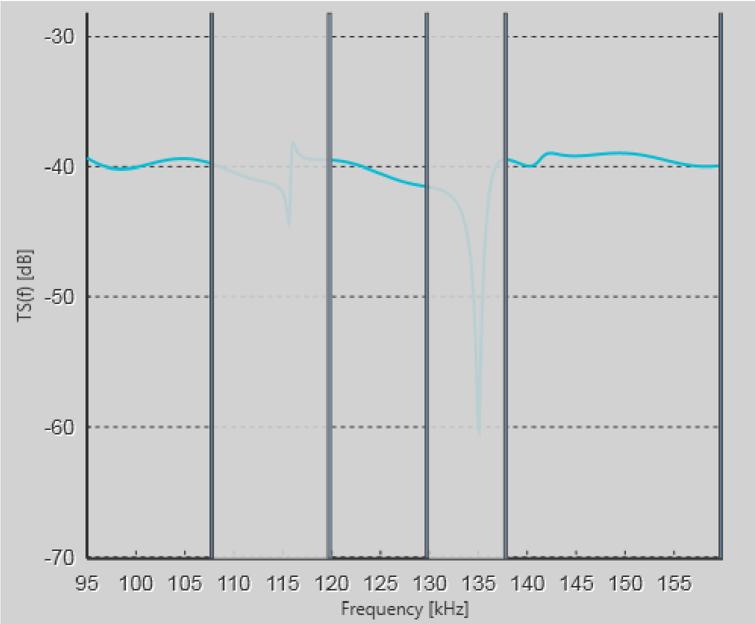
Adjusting the frequency bands

Due to their unique characteristics, the various calibration spheres offer different target strengths when the frequency changes. This is clearly seen when you calibrate in FM using a larger frequency band. If the shape of the curve shows significant differences in the target strength, the calibration using the related frequency band(s) will be inaccurate.



You can remove one or more frequency bands from the calibration processing. This is done by defining "stop bands". The EK80 is *not calibrated* for the frequencies inside the chosen frequency band. The software in the EK80 will instead interpolate calibration values.

- Select **Add Inhibited Band**, then select a spot on the curve to add a frequency band to the TS/Frequency curve. Only the frequencies *outside* this band will be used for calibration.
- Select **Remove Inhibited Band**, then select a band on the curve to delete it from the TS/Frequency curve.



As an alternative, you can do the entire calibration one more time using another sphere. The results from the second calibration must then be merged with the results from the first calibration.

Details

Select Sphere

You can use this function to select another sphere from the drop down menu.

Add Sphere

Select this option to add a new sphere (calibration target) to the list. A dedicated dialog box is used to accept the necessary parameters.

Remove Sphere

Select this option to remove the currently selected sphere (calibration target) from the list.

Modify Sphere

Select this option to modify the parameters of the currently selected sphere (calibration target). A dedicated dialog box is used to accept the necessary parameters.

Add Inhibited Band

Select **Add Inhibited Band**, then select a spot on the curve to add a frequency band to the TS/Frequency curve. Only the frequencies *outside* this band will be used for calibration. The size of the frequency band can be adjusted by clicking the right or left border of the rectangle, and moving it sideways.

Remove Inhibited Band

Select **Remove Inhibited Band**, then select a band on the curve to delete it from the TS/Frequency curve.

Related tasks

Starting the target strength calibration, page 379

Importing the echo data, page 381

Processing the echo data, page 385

Related dialog boxes

Calibration Wizard dialog box #1 (Start), page 394

Calibration Wizard dialog box #2 (Select Channel), page 395

Calibration Wizard dialog box #3 (Select Sphere), page 396

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #5 (Process Data), page 407

Calibration Description dialog box, page 416

Single Target Detection dialog box, page 417

Related topics

Edit/Add Sphere dialog box, page 414

Calibration Wizard dialog box #4 (Import Data)

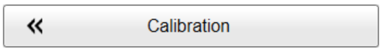
The fourth page in the **Calibration Wizard** allows you to import the echo data into the calibration process. You can make changes to the single target detection, and add a brief description, but you are not permitted to do anything with the echo data.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* page of the **Calibration Wizard** dialog box, select the channel to calibrate and select **Next** at the bottom of the page. This opens page 3. In the *third* page of the **Calibration Wizard** dialog box, select the sphere to calibrate for and select **Next** at the bottom of the page.This opens page 4.

Description

The fourth page of the **Calibration Wizard** dialog box is divided into three fields.

Tip

To change the size of the individual field, click and drag the field borders. You can also increase the size of the dialog box. To make the dialog box cover the entire screen, double-click the title bar.

- **Target Position field**

  The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The right side of the field shows the calibration layer that is automatically created once the calibration starts.

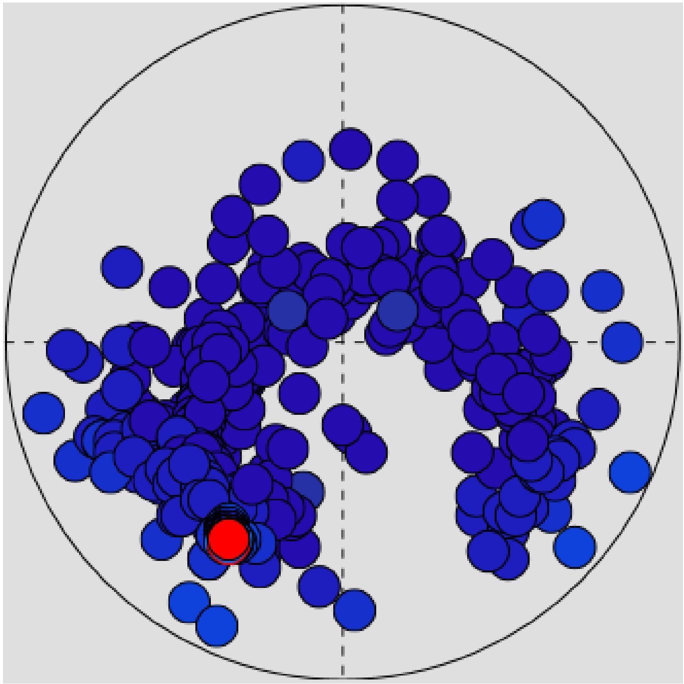
- **Frequency/Target Strength field**

  The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. This is the same curve as you can see in the **Calibration Wizard** dialog box page four, but with a few additional features.

- **Numerical field**

  The *Numerical* field provides several tabbed pages. The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. The page also provides a visual presentation of the coverage. The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data. The **TS Data** page displays the numerical parameters related to each individual echo.

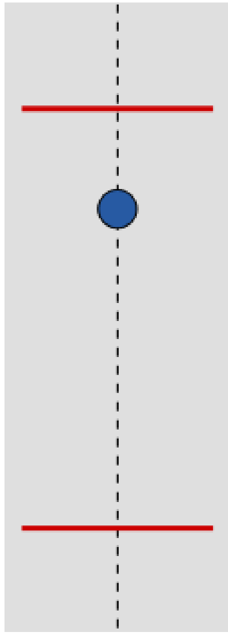
Target Position field



The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The echoes are compensated for their positions within the beam, so that echoes from the outer edge appear with the same echo strength as those in the middle of the beam.

- When you calibrate for CW (continuous wave), the outer border of the beam model signifies a 3 dB loss.
- In FM calibrations, additional circles (dotted lines) are added to signify the upper and middle frequencies.

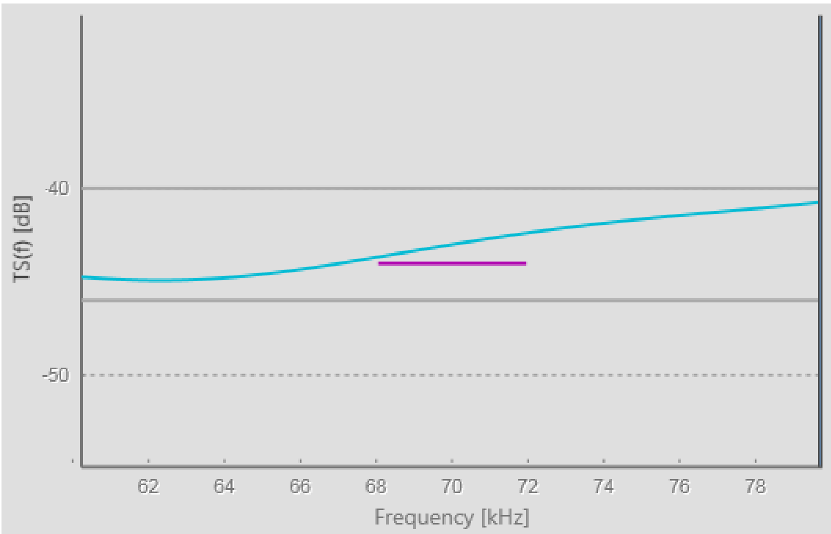
If you select a single echo on the **TS Data** list, the relevant echo is shown with a red colour in the *Target Position* field. You will not be able to do anything with the echoes at this time. The **TS Data** page only provides the list. However, on the fourth page of the **Calibration Wizard** you can remove the echoes that you do not wish to be included in the calibration.



The right side of the field shows the calibration layer that is automatically created once the calibration starts. You can see how each individual echo is received within the calibration layer. This calibration layer is automatically established when the **Calibration Wizard** is started. Its purpose is to remove echoes over and below the calibration target(sphere). You can easily see the layer in the echogram, as it is identified with two red horizontal lines. If you see that many echoes are in fact falling outside the layer, you can adjust its size by clicking on the red lines and moving them up or down. The red lines in the echogram will be moved accordingly, but the lines in the *Target Position* field will assume their original position once you release the mouse button.

Frequency/Target Strength field

The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. The field is located below the *Target Position* field.



The *Frequency/Target Strength* field shows the relationship between the frequency and the target strength for the sphere in current use.

- The blue line represents the relationship curve.
- The two grey lines reflect the limits defined by the **TS Deviation** setting on the **General** page in the *Numerical* field. Echoes over and below these lines will not be imported into the calibration process.
- The purple line reflects the bandwidth of the current "ping". The bandwidth is inverse proportional with the pulse length.

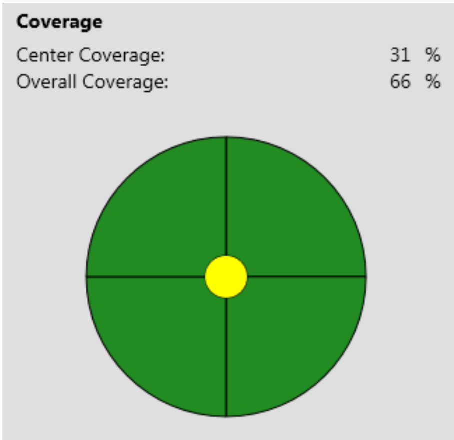
Numerical field

This field is located on the right side of the **Calibration Wizard** dialog box. The *Numerical* field provides several tabbed pages.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. You can define parameters relevant for the target sphere. The page also provides a visual presentation of the coverage.
- The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data. When you calibrate in FM, the page also offers curves to monitor the gain, the beamwidth and the beam offset as a function of the operating frequency.
- The **TS Data** page displays the numerical parameters related to each individual echo. If you select a single echo on the **TS Data** list, the relevant echo is shown with a red colour in the *Target Position* field.

  You will not be able to do anything with the echoes at this time. The **TS Data** page only provides the list. However, on the fourth page of the **Calibration Wizard** you can remove the echoes that you do not wish to be included in the calibration.

Coverage



During the data import, monitor the coverage.

The **General** page in the *Numerical* field presents both numerical and a visual presentation of the coverage. The area covered by the transducer beam is shown as a circle with "slices" for each transducer sector. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

The coverage circle uses colour coding to show you the current coverage.

- Red colour means that you do not have enough echoes in the relevant sector (0 to 25%).
- Yellow colour means that you have many echoes in the relevant sector, but not enough (25 to 50%).
- Green colour means that you have enough echoes in the relevant sector for a successful calibration (better than 50% coverage).

A small circle in the middle represents the coverage in the centre of the beam. It uses the same colour coding.

The numerical values for the center and overall coverage are shown over the coverage circle.

Calibration layer

When the calibration process is started, a dedicated layer is automatically created. If a strong and easily detected echo from the calibration sphere is shown in the echogram, the layer will position its borders over and under the target.

You must lower the sphere to a known depth. If you manage to *keep* the sphere at this depth when is moved in the beam during the calibration, you can adjust the calibration layer to make a smaller "depth window". This removes unwanted echoes.

During the calibration process, the calibration layer must be monitored and adjusted to compensate for the target's depth changes. These depth changes are easy to see in the echogram, or on the right side of the *Target Position* field. The depth limits of the calibration layer can be adjusted in three different ways:

- You can select a red line in the echogram, and drag it up or down.
- You can select a red line on the right side of the *Target Position* field, and drag it up or down.
- You can adjust the **Min Depth** and **Max Depth** settings on the **General** page in the *Numerical* field.

Details

Start/Stop/Continue

This button starts (and stops) the import of echo data to the calibration program. While the import is active, each echo is drawn in the *Target Position* field. When you are calibrating with "live data", keep importing echoes until these are evenly distributed inside the circular beam.

Save/Save As

Select **Save** or **Save As** to save the calibration data. You must save the calibration data before you continue to page four in the **Calibration Wizard** dialog box. You are not saving raw echo data here, but an XML file that contains the information necessary to run the calibration process.

Calibration Description

Select this option to open the **Calibration Description** dialog box.It is always useful to document your calibration for future references. The **Calibration Description** dialog box allows you to record information about your current calibration operations. The information is saved in the XML file.

Single Target Detection

Select this option to open the **Single Target Detection** dialog box. The **Single Target Detection** parameters are used to control the operational settings for the detection of single targets.

In order to detect single fish correctly, these parameters must be defined to suit the target characteristics. The chosen settings do not have any effect on the raw data you save during the survey. During calibration, the settings are used to maximize the detection of the calibration sphere, and suppress other echoes in the calibration layer.

Note

Once you start the import process, you can no longer change these parameters.

TS Deviation

This setting is located on the **General** page in the *Numerical* field. The **TS Deviation** setting allows you to control the maximum permitted deviation for the echoes from the calibration target (sphere). Echoes outside the defined limit are not imported. The limit you select is shown in the *Frequency/Target Strength* field.

Tip

Reducing the numerical value of the **TS Deviation** *setting may be useful to filter out echoes from other targets than the sphere.*

Minimum/Maximum Depth

These settings are located on the **General** page in the *Numerical* field. Use these parameters to adjust the depth limits of the calibration layer, thus creating a "depth window". Echoes from objects outside the defined limits are not imported.

Tip

You must lower the sphere to a known depth. If you manage to keep the sphere at this depth when is moved in the beam during the calibration, you can adjust the calibration layer to make a smaller "depth window". This removes unwanted echoes. During the calibration process, the calibration layer must be monitored and adjusted to compensate for the target's depth changes.

The depth limits of the calibration layer can be adjusted in three different ways:

- *You can select a red line in the echogram, and drag it up or down.*
- *You can select a red line on the right side of the Target Position field, and drag it up or down.*
- *You can adjust the* **Min Depth** *and* **Max Depth** *settings on the* ***General*** *page in the Numerical field.*

Related tasks

Starting the target strength calibration, page 379

Importing the echo data, page 381

Processing the echo data, page 385

Related dialog boxes

Calibration Wizard dialog box #1 (Start), page 394

Calibration Wizard dialog box #2 (Select Channel), page 395

Calibration Wizard dialog box #3 (Select Sphere), page 396

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #5 (Process Data), page 407

Calibration Description dialog box, page 416

Single Target Detection dialog box, page 417

Related topics

Calibration Description dialog box, page 416
Single Target Detection dialog box, page 417

Calibration Wizard dialog box #5 (Process Data)

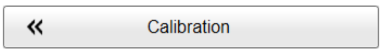
The fifth page in the **Calibration Wizard** allows you to manually "clean" the echo data before you process it to calibrate the EK80. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* page of the **Calibration Wizard** dialog box, select the channel to calibrate and select **Next** at the bottom of the page. This opens page 3. In the *third* page of the **Calibration Wizard** dialog box, select the sphere to calibrate for and select **Next** at the bottom of the page.This opens page 4.

At the bottom of the *fourth* **Calibration Wizard** dialog box, save the recorded calibration data. Then, select **Next**.

If you select **Reprocess previous calibration data** on the *first* page of the **Calibration Wizard**, selecting **Next** will take you straight to this *fourth* page.

Description

The fourth page of the **Calibration Wizard** dialog box is divided into three fields.

Tip

To change the size of the individual field, click and drag the field borders. You can also increase the size of the dialog box. To make the dialog box cover the entire screen, double-click the title bar.

- **Target Position field**

  The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The right side of the field shows the calibration layer that is automatically created once the calibration starts.

- **Frequency/Target Strength field**

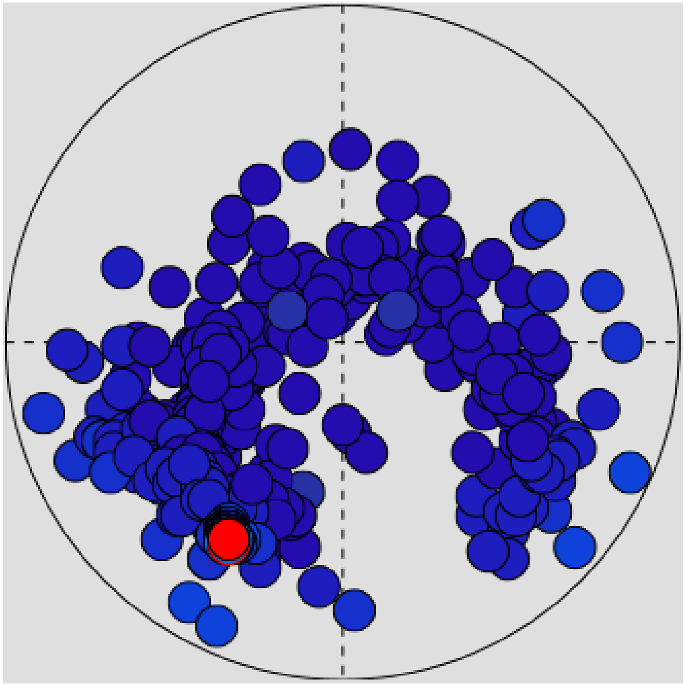
  The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. This is the same curve as you can see in the **Calibration Wizard** dialog box page four, but with a few additional features.

- **Numerical field**

  The *Numerical* field provides several tabbed pages.

  - The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. The page also provides a visual presentation of the coverage.
  - The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data.
  - The **TS Data** page displays the numerical parameters related to each individual echo.
  - The **Results** page displays the numerical parameters that are created by the calibration processing.
  - The **Error Analysis** page displays all the individual echoes that are imported into the calibration program.

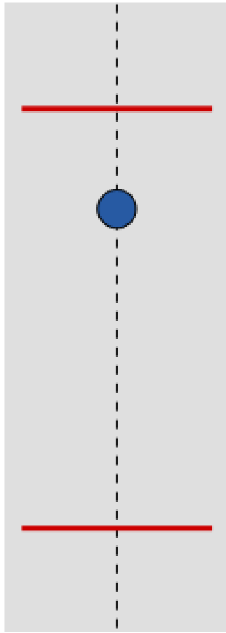
Target Position field



The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All echoes are placed inside a circle to reflect their locations in the beam. The echoes are compensated for their positions within the beam, so that echoes from the outer edge appear with the same echo strength as those in the middle of the beam.

- When you calibrate for CW (continuous wave), the outer border of the beam model signifies a 3 dB loss.
- In FM calibrations, additional circles (dotted lines) are added to signify the upper and middle frequencies.

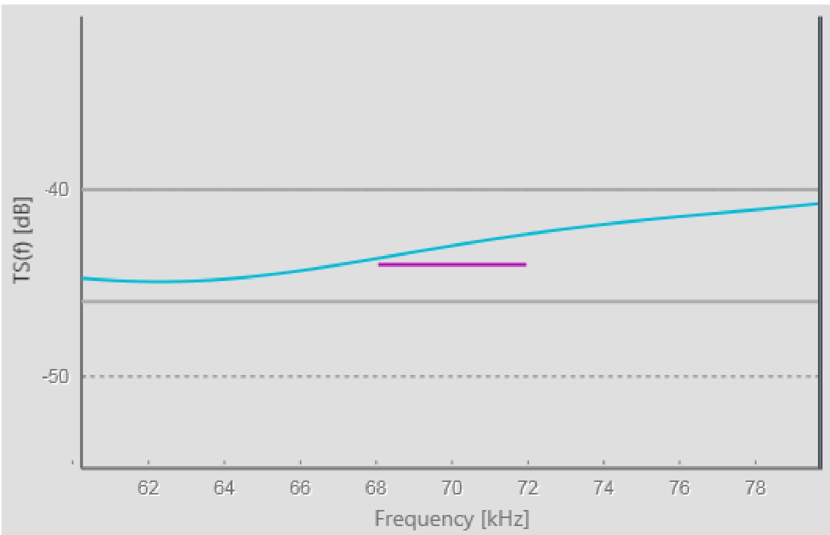
If you select a single echo on the **TS Data** list, the relevant echo is shown with a red colour in the *Target Position* field. In the **TS Data** list, you can suspend individual echoes from the calibration processing. Such echoes would typically be located outside the beam, and they are easy to spot in the graphic presentation.



The right side of the field shows the calibration layer that is automatically created once the calibration starts. You can see how each individual echo is received within the calibration layer. This calibration layer is automatically established when the **Calibration Wizard** is started. Its purpose is to remove echoes over and below the calibration target(sphere). You can easily see the layer in the echogram, as it is identified with two red horizontal lines. If you see that many echoes are in fact falling outside the layer, you can adjust its size by clicking on the red lines and moving them up or down. The red lines in the echogram will be moved accordingly, but the lines in the *Target Position* field will assume their original position once you release the mouse button.

Frequency/Target Strength field

The *Frequency/Target Strength* field shows a curve reflecting the target strength of the sphere for individual frequencies. The field is located below the *Target Position* field.



The *Frequency/Target Strength* field shows the relationship between the frequency and the target strength for the sphere in current use.

- The blue line represents the relationship curve.
- The two grey lines reflect the limits that were defined by the **TS Deviation** setting on the previous page.
- The purple line reflects the bandwidth of the current "ping". The bandwidth is inverse proportional with the pulse length.

Numerical field

This field is located on the right side of the **Calibration Wizard** dialog box. The *Numerical* field provides several tabbed pages.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection. You can define parameters relevant for the target sphere. The page also provides a visual presentation of the coverage.
- The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data. When you calibrate in FM, the page also offers curves to monitor the gain, the beamwidth and the beam offset as a function of the operating frequency.
- The **TS Data** page displays the numerical parameters related to each individual echo. If you select a single echo on the **TS Data** list, the relevant echo is shown with a red colour in the *Target Position* field.
- The **Results** page displays the numerical parameters that are created by the calibration processing.
- The **Error Analysis** page displays all the individual echoes that are imported into the calibration program. Each echo is shown using a colour to indicate the individual target strength.

Suspending individual echoes

In the **TS Data** list, you can suspend individual echoes from the calibration processing. Such echoes would typically be located outside the beam, and they are easy to spot in the graphic presentation.

To find the echoes you wish to suspend, select the top row in each table column to sort the content.

You can also select a single echo in the *Target Position* field. The corresponding row in the **TS Data** list will be shown with a grey background colour.

To remove a single echo from the calibration processing, select **Suspended** in the left column. The chosen echo changes to white colour in the *Target Position* field.

Results page

The **Results** page displays the numerical parameters that are created by the calibration processing.

Different results are offered for CW and FM calibration.

- After an FM calibration, the results are provided as graphs for beam offset, beam width and gain.
- After a CW calibration, the results are provided as list that also includes offset and sA correction.

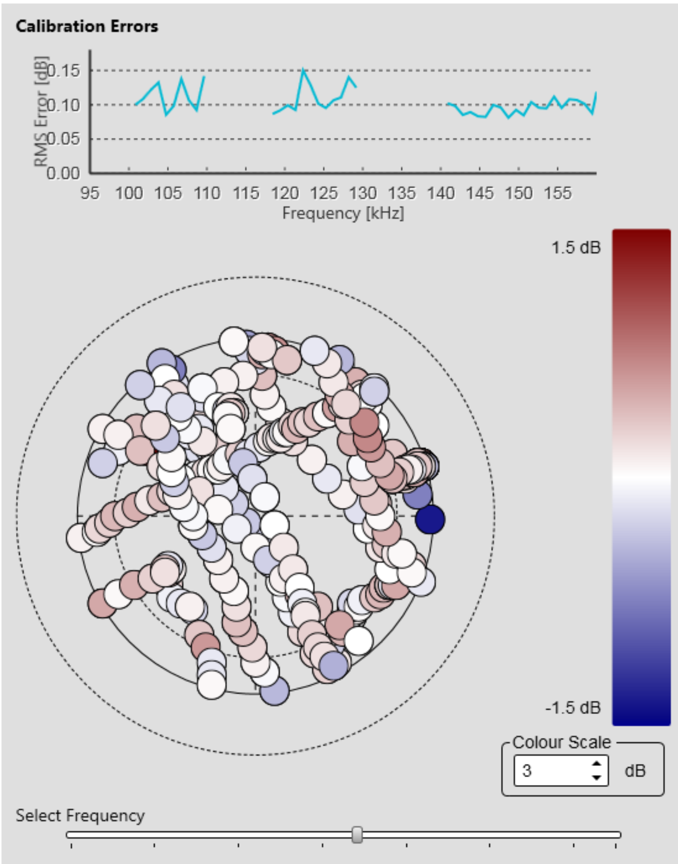
Note

The sA correction is only calculated for CW transmissions.

- *When calibrating a Wide Band Transceiver (WBT), the effective pulse duration is calculated and used to establish the sA correction. This will normally result in a sA correction around 0 dB.*
- *When calibrating a General Purpose Transceiver (GPT), the sA correction is based on the nominal pulse duration. This will normally result in a slightly negative sA correction.*

Error analysis

The **Error Analysis** page displays all the individual echoes that are imported into the calibration program.



The error analysis is based on an estimated target strength value from your calibration sphere. This estimate is based on the sphere parameters, the depth and the operational frequency. Each echo is shown using a colour to indicate the individual target strength. This allows you to locate echoes that are stronger or weaker than the estimated target strength.

You can change the colour scale to increase or decrease the resolution.

- In CW, the error value is presented in dB, and reflects the difference between the strongest and weakest echo. Ideally, this difference should be as small as possible.
- When you calibrate in FM, an extra curve is added to reflect the calibration errors. The curve presents the error (in dB) as a function of the operational frequency. At the bottom of the page, you can select which frequency to use.

Details

Reprocess

Select **Reprocess** to start the calibration processing The function stops automatically. You can calibrate as many times as you like.

Save/Save As

Select **Save** or **Save As** to save the calibration data. You are not saving raw echo data here, but an XML file that contains the information necessary to run the calibration process.

Calibration Description

Select this option to open the **Calibration Description** dialog box.It is always useful to document your calibration for future references. The **Calibration Description** dialog box allows you to record information about your current calibration operations. The information is saved in the XML file.

Finish

Select **Finish** to terminate the calibration process. The calibration results are automatically implemented by the EK80 program.

Select **Save** or **Save As** to save the calibration data.

Update the calibration used by the echo sounder using **Merge** or **Replace**.

- These options are not valid for CW calibration. In CW, several sets of calibration values are saved, one for each pulse duration.
- When you calibrate with FM pulses, use **Merge** or **Replace** as follows:
  - Use **Merge** if you are calibrating with more than one sphere. This will cover the entire frequency range of the transducer. Used together, these spheres will provide you with a wider frequency band, and the calibration results are merged.
  - Use **Replace** to remove all old calibration results. This allows you to only use the latest parameters for the relevant channel.

  In FM, one single set of calibration values is saved, and this set covers all pulse durations.

Related tasks

Starting the target strength calibration, page 379

Importing the echo data, page 381

Processing the echo data, page 385

Related dialog boxes

Calibration Wizard dialog box #1 (Start), page 394

Calibration Wizard dialog box #2 (Select Channel), page 395

Calibration Wizard dialog box #3 (Select Sphere), page 396

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #5 (Process Data), page 407

Calibration Description dialog box, page 416

Single Target Detection dialog box, page 417

Related topics

Calibration Description dialog box, page 416
Single Target Detection dialog box, page 417

Edit/Add Sphere dialog box

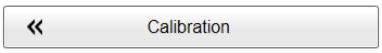
An accurate calibration is based on the parameters of the calibration sphere. If you purchase a new sphere, or need to change the parameters on an existing sphere, this dialog box is used.

Prerequisites

The **Add/Edit Sphere** dialog box is opened from the third page in the **Calibration Wizard** dialog box. The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

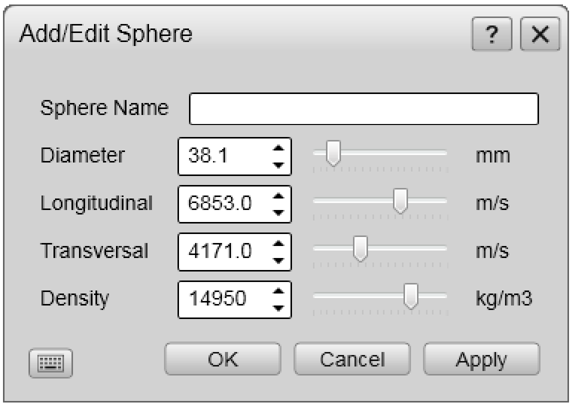
To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* **Calibration Wizard** dialog box, select which channel to calibrate. In the *third* **Calibration Wizard** dialog box, select channel sphere. Select **Add Sphere** or **Modify Sphere** to open the **Add/Edit Sphere** dialog box.

Description

Calibration spheres are provided in different sizes to fit different operational frequencies. They are also manufactured from different materials, mainly Copper (Cu) and Carbide (TC). The latter is also referred to as Wolfram carbide (Wo-Co). "Co" is short for Cobalt, which is used as binder in the sphere. Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies.



Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Tip

To see the curve that shows the relationship between the operational frequency and the sphere's target strength, see the fourth page in the **Calibration Wizard** *dialog box.*

National Oceanic and Atmospheric Administration (NOAA) provides a web based sphere target strength calculator on the following URL: http://swfscdata.nmfs.noaa.gov/AST/SphereTS

Details

Sphere Name

Type the name you wish to use to identify the calibration sphere. Note that while *editing* the sphere parameters, you are not permitted to change its name.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

Diameter

Select the outer diameter of the calibration sphere (in millimeters).

Longitudinal Sound Speed

Set the sound speed in the longitudinal direction. If your sphere is made from Copper (Cu) or Tungsten (WC), use the following standard values.

- **Cu**: 4760 m/s
- **WC**: 6853 m/s

Transversal Sound Speed

Set the sound speed in the transversal direction. If your sphere is made from Copper (Cu) or Tungsten (WC), use the following standard values.

- **Cu**: 2288.5 m/s
- **WC**: 4171 m/s

Density

Set the density of the calibration sphere. If your sphere is made from Copper (Cu) or Tungsten (WC), use the following standard values.

- **Cu**: 8945 kg/m
- **WC**: 14900 kg/m

Related topics

Calibration Wizard dialog box #3 (Select Sphere), page 396

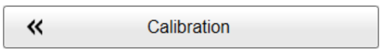
Calibration Description dialog box

It is always useful to document your calibration for future references. The **Calibration Description** dialog box allows you to record information about your current calibration operations. The information is saved in the XML file.

How to open

The **Calibration Description** dialog box is opened from the third and fourth pages in the **Calibration Wizard**.

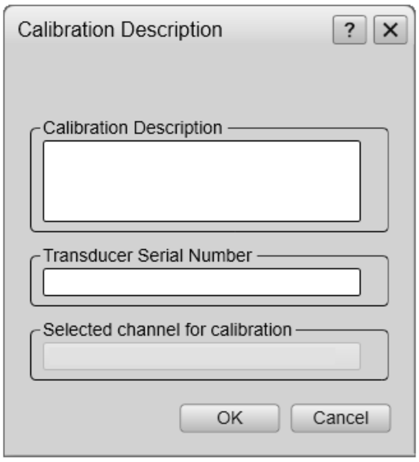
To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* page of the **Calibration Wizard** dialog box, select the channel to calibrate and select **Next** at the bottom of the page. This opens page 4. At the bottom of the *fourth* **Calibration Wizard** dialog box, save the recorded calibration data. Then, select **Next**. This opens page 5.

If you select **Reprocess previous calibration data** on the *first* page of the **Calibration Wizard**, selecting **Next** will take you straight to this *fourth* page.

Description



You can type in any kind of relevant information into the **Calibration Description** text field. This can be for example the vessel's location, weather conditions, or the name of the people who did the calibration.

The information you type is added to the XML file with the calibration data. The date and time of the calibration are automatically added to the XML file names. The **Calibration Description** dialog box also shows you the serial number of the transducer that is used on the channel that is calibrated, as well as the name of the channel you are calibrating. This information is retrieved automatically.

Related dialog boxes

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #1 (Start), page 394

Related topics

Calibration Wizard dialog box #4 (Import Data), page 400
Calibration Wizard dialog box #5 (Process Data), page 407

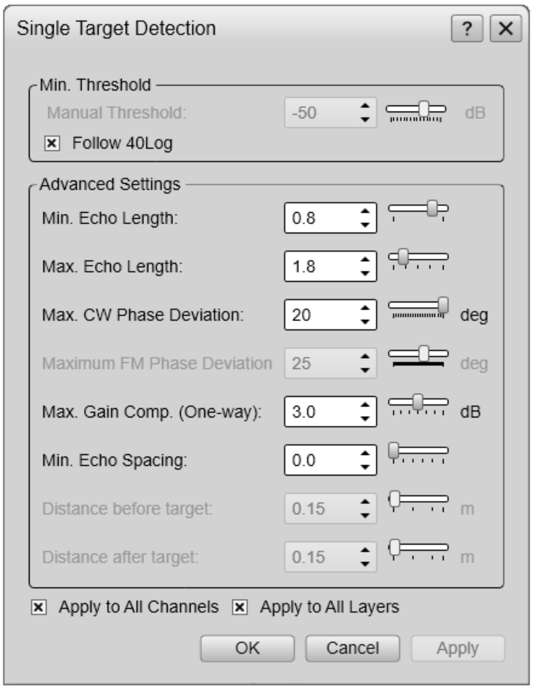
Single Target Detection dialog box

The **Single Target Detection** parameters are used to control the operational settings for the detection of single targets. During calibration, the settings are used to maximize the detection of the calibration sphere, and suppress other echoes in the calibration layer.

How to open

The **Single Target Detection** dialog box can be opened from the third and fourth page in the **Calibration Wizard**. In order to start this wizard, the EK80 must be in either *Normal* or *Replay* mode.

Description



A dedicated calibration layer is created to isolate the echo from the sphere. Still, several other echoes may be present within the same layer, for example due to fish. In order to detect the sphere correctly, these parameters must be defined to suit its characteristics.

Note

The settings available in the **Single Target Detection** *dialog box are provided for expert users and extreme conditions. For all practical purposes, use the default values for normal calibration of the EK80.*

When the **Single Target Detection** dialog box is opened, the availability of the functions reflects the current operational settings are read. Certain parameters will therefore be unavailable.

Details

Minimum Threshold

This setting applies to both CW and FM operation.

Some echoes are stronger than others. If you have noise problems, or you are bothered with for example smaller fish (different species), jellyfish or plankton, you can use the **Minimum Threshold** function to adjust the sensitivity. The target strength (TS) for a single target must exceed this threshold (in dB) to be accepted.

Use this function to define a "filter" value.

Minimum Echo Length / Maximum Echo Length

These settings only apply to CW operation.

The echo from a single target will normally have a similar (or slightly longer) length than the length of the transmitted signal. This is due to the physical properties of the target.

Some single targets are so close in range that they are overlapping. These will give you a longer echo than the length of the transmitted pulse. It is important that such multiple targets are excluded. By using the echo length values, you can define the maximum and minimum length of the echo compared to the transmitted pulse. If the echo is too long or too short, it will be excluded.

Example

If you set **Minimum Echo Length** to 0.8, all echoes shorter than 0.8 times the length of the transmitted pulse will be deleted.

If you set **Maximum Echo Length** to 1.8, all echoes longer than 1.8 times the length of the transmitted pulse will be deleted.

During calibration, you may experience fishes close to the calibration sphere. You may then try to set the filter to a smaller "opening" in order to remove fish echoes.

Maximum CW Phase Deviation

This setting only applies to CW operation.

Several single targets occurring at the same range will give you echoes in different parts of the beam's cross section. All samples in an echo from a single target will normally have similar phase value (angles) as the samples arrives from the same location. Echoes from multiple targets or random noise will show great variation in phase.

To remove the bad targets, the angle (phase) between the samples in the echo are measured. If the angle is too large, the echoes are deleted.

During calibration, you may experience fishes appearing at the same distance as the calibration sphere. You may then try to remove these echoes by reducing the phase deviation.

Maximum FM Phase Deviation

This setting only applies to FM operation.

Several single targets occurring at the same range will give you echoes in different parts of the beam's cross section. To remove the bad targets, the angle (phase) between the samples in the echo are measured. If the angle is too large, the echoes are deleted.

If the angle at a given range is too large, this indicates multiple targets.

During calibration, you may experience fishes appearing at the same distance as the calibration sphere. You may then try to remove these echoes by reducing the phase deviation.

Maximum Gain Compensation

This setting applies to both CW and FM operation.

Not all single targets are located in the centre of the beam. Targets located off centre will offer weaker echoes due to the beam properties. The EK80 automatically compensates for this using a mathematical model, and you can manually control the effect of this algorithm by defining a maximum gain value.

Using the 3 dB setting all echoes from within the nominal beam width of the transducer will be accepted. By reducing the value, you will only accept echoes that appear closer to the centre of the beam. Reducing the value of this parameter will effectively narrow the beam opening angles for single target detections, but will normally improve the accuracy of the target strength values for the detected single targets.

Minimum Echo Spacing

This setting only applies to CW operation.

This parameter defines the minimum distance between two single echoes when you are using CW pulses. If they are too close, the echoes are skipped.

The distance is defined as a relation to the length of the transmitted signal. Selecting *1* means that the minimum spacing corresponds to the physical distance covered by the transmit pulse. Increasing the value will require the targets to be further separated, but can improve the accuracy of the target strength values.

Tip

Overlapping targets will not be identified with this function. Use the **Minimum Echo Length**, **Maximum Echo Length** *and* **Maximum CW Phase Deviation** *to handle these.*

Distance Before Target / Distance After Target

These settings only apply to FM operation.

The **Distance Before Target** and **Distance After Target** settings define the required spacing before and after one target to the end and beginning of the next target. This is the same functionality as the **Minimum Echo Spacing** function for CW operations, but the algorithms are very different.

They also define the range of target samples which are used for Fourier transformation to create the target strength frequency response (the curve in the *TS(f)* information pane) and the target position phase values.

Increasing the distance values will require the targets to be further separated, but can increase the frequency resolution for the target strength frequency response (in the *TS(f)* information pane).

The value for the **Distance After Target** should normally be larger than the value for **Distance Before Target** due to the backscattering properties of a target. The values are specified in meters and are applied on the matched filtered/pulse compressed sample data.

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Apply to All Layers

Select this box to apply the current selection to all the depth layers you are using on the EK80.

Related dialog boxes

Calibration Wizard dialog box #4 (Import Data), page 400

Calibration Wizard dialog box #1 (Start), page 394

Related topics

Calibration Wizard dialog box #4 (Import Data), page 400
Calibration Wizard dialog box #5 (Process Data), page 407

Velocity measurement calibration

Topics

Calibration for velocity measurements

In order to maintain the accuracy provided by the Simrad EK80, and required for scientific applications, the system must be calibrated.

We strongly recommend that calibration surveys are done at regular intervals. As a minimum, calibration must be done prior to each survey.

Note

Calibration must be taken seriously. To achieve the best results, the calibration must be planned and done carefully.

Calibration for EK80 velocity measurements requires the use of a global positioning system (GPS) and an ADCP transducer. The calibration method involves collecting data from the GPS and ADCP transducer while traversing at set of courses forming a pattern resembling an "L". You must do this twice creating a total of four lines. Rotate the vessel heading 90 degrees between each pair of courses. Traversing the same distance in opposite directions helps to ensure that no directional bias is introduced.

The ratio of Speed Over Ground (SOG) from the GPS and SOG from the ADCP is used to correct the measurements from the ADCP. Average differences for pitch, roll and yaw are also used to correct the ADCP measurements.

For a successful calibration you need to keep the fixed heading for at least 10 minutes (400 to 800 meters) before changing course.You must use an area with a flat bottom on minimum 30 metres depth.

Any adjustments to the EK80are done automatically by the calibration program. No gain adjustments are required.

Note

Velocity measurement calibration is always performed using replay data or reprocessing of calibration data.

If you have a EK80 system with several transceivers, you must calibrate one by one.

- If you add a new transducer to a previously calibrated EK80 system, this new channel must be calibrated.
- If a calibrated transducer is moved from one transceiver to another, you must still calibrate the transducer on the "receiving" transceiver.
- If a calibrated transducer is removed, and then later reconnected to the same transceiver, the calibration data exist. A new calibration is not required.

A new calibration may also be required after an update of the EK80 software. Refer to the software release note.

The information provided by the calibration is entered into the EK80 software as operational parameters. This is done automatically.

Tip

We recommend that you calibrate the EK80 in calm sea.

Related topics

Calibration function, page 443
Calibration summary for velocity measurements, page 424

Calibration summary for velocity measurements

The EK80 calibration for velocity measurements requires input data from a GPS system and data from the ADCP. The ratio of the measured Speed Over Ground from the ADCP system and the GPS system is used to adjust the ADCP data. The calibration process for velocity measurements involves several steps. The first step is comprised of preparation and test procedures for the EK80. Second step holds field procedures to collect and store ADCP and GPS data. The third step includes post-field procedures to process the data and adjust the settings in the ADCP software. A summary of the target strength calibration process is provided.

Prerequisites

In order to calibrate EK80 for velocity measurements the following equipment and conditions must be in place.

Calibration for EK80 velocity measurements requires the use of a global positioning system (GPS) and an ADCP transducer. Ensure that you have selected the site carefully and that it is suitable with respect to standard site selection criteria considerations.

Procedure

1 Prepare and check the vessel and the EK80 system for velocity measurements calibration.

   a Prepare the vessel for EK80 calibration.

   Preparing the EK80 for calibration, page 376

   b Setup the EK80 for velocity measurements calibration.

   Setting up the EK80 system for calibration, page 429

2 Create a filing system for the ADCP files.

   The calibration process creates an extensive set of raw data files. A standard naming conventions for data files must be used. File names must always be unique and must be descriptive of the data contained. Location name, line number, project name, project number are some of the descriptive terms that could be used in a file name.

   A data storage and archiving system must also be defined. A local policy must be adopted to reference and document any additions to or deviations from this system.

   Defining the file and folder settings for raw data recording, page 434

   Recording raw data during calibration, page 436

3 Start collecting velocity measurement calibration data.

   Important

   Current velocity measurement calibration is always performed from stored files and not using live data.

Collecting data for calibration, page 430

4 Process the velocity measurements calibration data.

Processing data for calibration, page 432

Calibration values are displayed in the **Numerical** field.

Related topics

Calibration for velocity measurements, page 422
Calibration function, page 443

Calibration procedures for velocity measurements

Topics

Selecting site location for velocity measurements

Proper field procedures are critical to obtaining high-quality ADCP measurements. Step-by-step procedures are an important aspect of high quality data collection. However nothing can substitute the field personnel who understand both the instrument and the effect of conditions in the area. This includes selecting a suitable site location.

Context

If you are unfamiliar with the location we recommend doing a trial run to get information about depth, maximum speed and maximum velocity at the site. Many of the ADCP measurement problems can be solved by simply moving to a better measurement site location.

These are general requirements for an ADCP velocity measurement calibration process.

Procedure

1. Select a location having a depth of at least 30 metres.

   Depth at the measurement site should allow for the measurement of two depth cell sizes. Depth below 1 m may offer challenging conditions for ADCP measurements, depending on the frequency of the instrument.

2. Avoid locations with velocities less than 9 cm/s. While measurements can be made in such conditions, the vessel speed must be extremely slow.

3. Avoid locations with highly turbulent waters.

Excessive turbulence can violate the assumption of homogenous flow required to collect reliable data.

4 Avoid locations in or close to local magnetic field disruptions caused by steel structures or transmission lines.

These can cause ADCP compass errors.

5 Avoid locations with high levels of suspended sediment and fast water velocities.

Moving bed effects are then likely to occur and might bias the data.

6 Avoid locations where signals from the satellites might bounce off structures or be blocked from the view.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Preparing the EK80 for calibration

Prior to calibration, you must check that your EK80 is fully functional.

Prerequisites

A fully functional EK80 system is vital for a successful calibration.

Context

It is necessary to measure the environmental conditions before the calibration starts.

Procedure

1 Start the EK80.

   a Check that the EK80 and all the transceivers and transducers are installed correctly.

   b Set **Operation** to *Normal*.

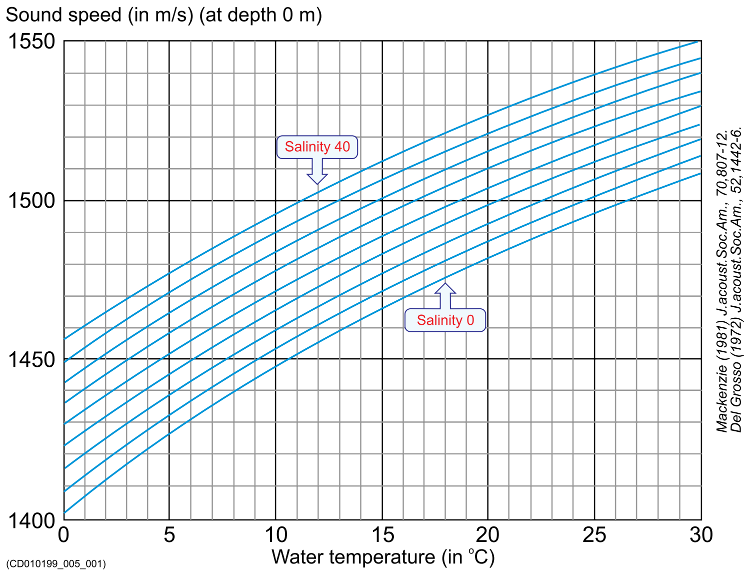
   c Start "pinging".

   d Verify that the EK80 is fully operational on all channels.

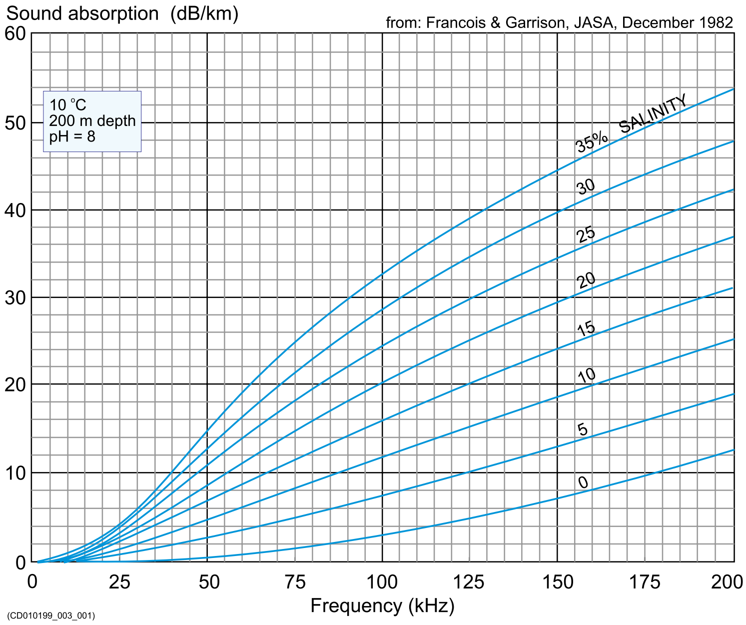
2 Measure the water salinity and temperature between the transducer and the planned depth of the calibration sphere.

3 Calculate the average salinity and temperature values, and type these into the **Environment** dialog box.

The sound velocity is automatically calculated by the EK80. The corresponding absorption coefficient is calculated by the echo sounder according to *Francois & Garrison, JASA December 1982*.



Sound speed in water for different salinity values



Sound absorption for different salinity values

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Setting up the EK80 system for calibration

Normal operation during a velocity measurements calibration requires the special settings of a range of parameters. This procedure describes the parameters and the settings required.

Prerequisites

In order to calibrate EK80 for velocity measurements the following equipment and conditions must be in place.

- Calibration for EK80 velocity measurements requires the use of a global positioning system (GPS) and an ADCP transducer.
- Ensure that you have selected the site carefully and that it is suitable with respect to standard site selection criteria considerations.

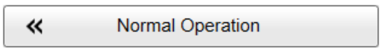
Procedure

1 On the **Operation** menu, set **Operation** to *Normal*.

2 In the **Normal Operation** dialog box, set up the operating parameters for the channel you wish to calibrate.

3 Open the **Operation** menu.

4 Select **Normal Operation**.



5 In the **Normal Operation** dialog box set the parameters accordingly:

a For the ADCP channel, set **Pulse Type** to *LFM-Up*.

In *LFM Up* the transmitted pulse starts using the lower frequency in the range, and ends with the upper frequency. "LFM" means "Linear Frequency Modulated".

b Set **Mode** to *Active*.

c Set **Power** to *Maximum*.

d Set **Start Frequency** and **End Frequency** to values permitted by your transducer.

Start Frequency and **End Frequency** for current velocity calibration is 138 kHz and respectively 162 kHz.

e Set **Max Current Speed** to the estimated highest current velocity.

f Set **Depth Cell Size** to minimum 8 m.

6 Select **OK** to save the selected setting and close the dialog box.

Further requirements

Proceed to setup the files for storing velocity measurement calibration data.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Collecting data for calibration

Prerequisites

In order to collect data for velocity measurements calibration the following elements must have been prepared.

- The vessel and the EK80 system must be working appropriately.
- The EK80 must be setup for velocity measurements calibration.
- The MRU must be working appropriately.
- The GPS system must be working appropriately.
- File setup for storage of the raw data recorded must have been prepared.
- Recording of raw data is started.

Context

The EK80 calibration for velocity measurements requires input data from a GPS system and data from the ADCP. The calibration process for velocity measurements involves several steps.

The calibration method involves collecting data from the GPS and ADCP transducer while traversing at set of courses forming a pattern resembling an "L". You must do this twice creating a total of four lines. Rotate the vessel heading 90 degrees between each pair of courses. Traversing the same distance in opposite directions helps to ensure that no directional bias is introduced. For a successful calibration you need to keep the fixed heading for at least 10 minutes (400 to 800 meters) before changing course.

The ratio of Speed Over Ground (SOG) from the GPS and SOG from the ADCP is used to correct the measurements from the ADCP. Average differences for pitch, roll and yaw are also used to correct the ADCP measurements.

The measured calibration adjustment will be the average from these 4 ADCP runs. If any of the ADCP measurements differ by more than 5% from the average a minimum of 4 new ADCP runs should be obtained. The average of all 8 ADCP runs will be used. f the measurement of one or more ADCP run is not within 5% of the average the ADCP run deviating from the mean may be replaced with an additional ADCP run.

Make sure you validate your data which you have collected and recorded before you proceed to operation.

Procedure

1 Bring the vessel to a stop at the starting point of the first calibration run.

2 Traverse along a course (400–800 m) at a constant compass heading and speed while collecting GPS and ADCP data (raw data).

3 Turn the vessel 180 degrees.

Note

At the turning point you can use the file split option in EK80 to create separate files for each line traversed.Alternatively you can stop recording data and resume recording when traversing the next course.

4 Traverse along a course (400–800 m) at a constant compass heading and speed while collecting GPS and ADCP data (raw data).

Two ADCP runs in opposite directions are made so that any residual current in the data will be cancelled out.

5 Bring the vessel to a stop.

6 Rotate the vessel heading 90 degrees.

7 Traverse along a course (400–800 m) at a constant compass heading and speed while collecting GPS and ADCP data (raw data).

8 Turn the vessel 180 degrees.

9 Traverse along a course (400–800 m) at a constant compass heading and speed while collecting GPS and ADCP data (raw data).

10 Validate your data.

11 Stop the recording.

12 Stop "pinging".

13 Select **Save** or **Save As** to save the calibration data.

You are not saving raw echo data here, but an XML file that contains the information necessary to run the calibration process.

Further requirements

Proceed to the **Calibration Wizard** for using the collected data to calibrate the EK80 system.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Processing data for calibration

The Calibration Wizard allows you to process the velocity measurement calibration data and adjust the calibration values for the EK80. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Prerequisites

Velocity measurement calibration data must be collected and stored before processing and updating calibration values.

Context

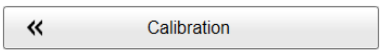
The **Calibration Wizard** offers 3 dialog boxes to guide you through the calibration process.

1. The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.
2. The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.
3. The third page in the **Calibration Wizard** allows you to import the calibration data into the calibration process. The calibration data recorded for each of the lines are processed separately. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Procedure

1 Process the velocity measurements calibration data.

  a On the **Setup** menu, select **Calibration**.



  a On the first page of the wizard, select **New calibration from raw data (Real time or Replay)**.

  b Select **Next** to continue.

  c On the *second* page of the wizard:

  d Select channel for calibration.

Note

Be sure to select the ADCP channel you would like to calibrate. The drop-down list includes calibration options for normal echo sounder function and for ADCP function for the transducer.

  e Select **Next** to continue.

  f On the *fourth* page of the wizard:

  g Select which replay files to process calibration from.

The location and name of the files following the suggested naming convention will make it easier to find the appropriate files.

There are four lines in a velocity measurement calibration process. Each line has a set of calibration data stored. You can select all four lines to use in the calibration, or you can use only a subset of the lines. The fields are marked **L1**, **L2**, **L3** and **L4**.

h Select **Start** for each of the lines you would like to include in the calibration process.

A progress bar becomes visible in the dialog box during processing. It disappears when the processing is finished.

The calibration values which are calculated are **Scale**, **Yaw**, **Pitch** and **Roll**. You are not updating the EK80 calibration values at this stage. You are not updating the EK80 calibration values at this stage.

i Select **Next** to continue.

2 Finalize the calibration process.

a Select **Save**.

The calibration data is now saved and you will proceed to the next step.

You are not updating the EK80 calibration values at this stage.

b Select **Finish**.

The EK80 calibration values will be updated when you proceed this procedure.

c Select **Yes**.

The EK80 calibration values are updated.

d Close the **Calibration Wizard** dialog box, and resume normal operation.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424
Calibration Wizard dialog box #4 (Import Data), page 400
Calibration functions and dialog boxes for velocity measurements, page 439

Selecting operating parameters for calibration

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements. The parameters must be defined before the calibration process starts.

Context

Each parameter must be defined to match the properties of the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

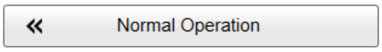
Note

You can not calibrate for current velocity measurements with "live" data. All data must be recorded before starting the calibration process.

Procedure

1 Open the **Operation** menu.

2 Select **Normal Operation**.



3 In the **Normal Operation** dialog box set the parameters accordingly:

   a For the ADCP channel, set **Pulse Type** to *LFM-Up*.

   In *LFM Up* the transmitted pulse starts using the lower frequency in the range, and ends with the upper frequency. "LFM" means "Linear Frequency Modulated".

   b Set **Mode** to *Active*.

   c Set **Power** to *Maximum*.

   d Set **Start Frequency** and **End Frequency** to values permitted by your transducer.

   Start Frequency and **End Frequency** for current velocity calibration is 138 kHz and respectively 162 kHz.

   e Set **Max Current Speed** to the estimated highest current velocity.

   f Set **Depth Cell Size** to minimum 8 m.

4 Select **OK** to save the selected setting and close the dialog box.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Defining the file and folder settings for raw data recording

The EK80 allows you to record both raw and processed echo data. The data are saved on the Processor Unit hard disk, or on an external data storage device, according to the preferences you have defined.

Context

File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Set up the file and folder parameters before you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Procedure

1 Open the **Operation** menu.

2 Select **Output**.

Observe that the **Output** dialog box opens. This dialog box contains a number of pages selected from the menu on the left side.

3 In the **Output** dialog box, select **File Setup**.

4 On the **File Setup** page, define the recording parameters.

a Define the output directory for the recorded files.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*. The same folder is used for both raw and processed files.

b Define a file name prefix.

By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey.

c Define the maximum amount of bytes to be contained in one data file.

Select **Maximum** for 1 GB file size.

The current size of the RAW data file is displayed during data recording. If the current file size gets too big during recording, select **Split File** on the **Record RAW** button. **Record RAW** is located on the **Operation** menu.

d Specify the raw data recording parameters.

The **Range** setting defines the vertical or horizontal distance from where the echo presentation starts to the end of the search area.

- Select **Common** to use the same recording range for all your active channels.
- Select **Auto** to allow the EK80 to automatically find the required range value.

- Select **Individual** to use the different recording ranges for your active channels.

The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

- Select **Complex samples** to use the default data format.
- Select **Power/Angle** to reduce the file sizes.
- Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

The **Motion Data Recording** function allows you to control how often the motion data are saved in the raw data file.

5 At the bottom of the page, select **Apply** to save your settings.

6 Select **OK** to close the dialog box.

Related topics

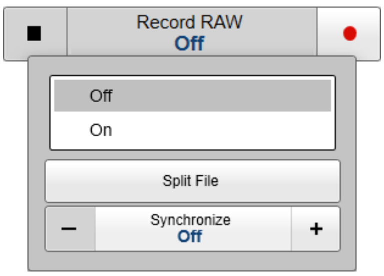
Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Recording raw data during calibration

Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. You can save the data to the Processor Unit hard disk, or onto an external storage device. If your Processor Unit is connected to a local area network, you can also save to a network disk. You can keep the recorded files for scientific studies, future references or for training purposes. The recording is controlled by the **Record RAW** function.

Prerequisites

Before you start data recording, make sure that you have defined where to store the files. To define which disks and folders to use to save the data files, use the **File Setup** page. The **File Setup** page is located in the **Output** dialog box. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.



Procedure

1 Open the **Operation** menu.

2 To start data recording, open the **Record RAW** button, and select *On*.

Alternatively, simply select the red circle on the right side of the button.

The **Record** indicator on the top bar changes its colour to reflect that recording is active.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

3 If you wish to reduce the size of the data file you are recording, click the middle of the **Record RAW** button to open it, and select **Split File**.

The current file is closed, and a new file is automatically started.

4 To stop recording, open the **Record RAW** button, and select *Off*.

Alternatively, select the black rectangle on the left side of the button to stop the recording.

Related topics

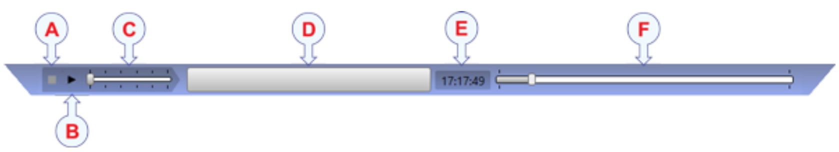
Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

Choosing which raw data file(s) to replay

Every time you record echo data, the information is stored on the Processor Unit hard disk. Depending on your initial settings, the files may also be stored on a USB hard disk or even a network disk. The echo data files can be retrieved, and played back on the EK80.

Context

All playback is controlled by the replay bar.



A ***Stop***: *Select this button to stop the playback. The replay bar is not removed from the presentation until you select another operating mode.*

B ***Play/Pause***: *Select this button to start the playback, or to pause it.*

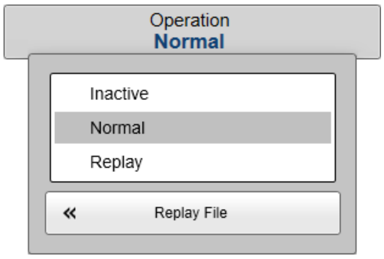
C ***Replay Speed***: *Select this slider and move it sideways to adjust the replay speed.*

D ***Replay File***: *The button shows you which file you are replaying. Select the button to open the **Replay File** dialog box.*

E ***Elapsed Time***: *This is the elapsed time of the replay sequence.*

F ***Playback Progress***: *This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.*

Procedure



1. Open the **Operation** menu.
2. Select **Operation** to see the available choices.
3. Select **Replay File** to open the dialog box.

   The **Replay File** dialog box allows you to choose which file(s) to play back. The file names were generated automatically during recording, and each file is identified with the time and date it was made.
4. Select **Add** to choose a replay file.

   A standard operating system dialog box is used to locate and select the files you wish to use.
5. If you wish to replay the selected files in an "endless" loop, select **Loop**.
6. If you wish to create index files for the selected files, select **Check for missing index files**.

   During raw file recording, the EK80 automatically creates index files to allow for easier navigation in the replay files. On old files, however, these index files are not present. If you activate the **Check for missing index files** function, the index files are created on the selected files before playback starts.

   Note

   Creating index files can take a long time if you have many or/and large replay files, or if the files are stored on a network server.
7. Select **OK** to save the selected settings and close the dialog box.
8. Set **Operation** to *Replay*.

   The replay bar opens automatically. It is positioned directly below the top bar at the top of the EK80 presentation.

Related topics

Calibration procedures for velocity measurements, page 426
Calibration summary for velocity measurements, page 424

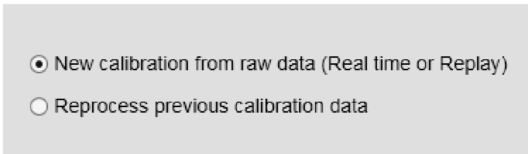
Calibration functions and dialog boxes for velocity measurements

Topics

Calibration Wizard dialog box #1(Start)

The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.

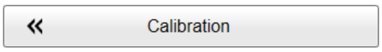
Prerequisites



The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



Description

The following options are provided.

- **New calibration from raw data (Real time or Replay)**: Select this option when you wish to start a new calibration process from scratch. You can either use "live data" for the calibration, or data that are previously recorded.

  It is possible to calibrate the EK80 using recorded data instead of live data. We recommend that you use live data, as this allows you to monitor the echoes in the beam while importing the data. If you wish to restart the whole calibration process later, you can use the raw data recording made during the calibration.

- **Reprocess previous calibration data**: Select this option when you have a previous calibration XML data file available for the calibration.

If you add a new transducer to a previously calibrated EK80 system, this new channel must be calibrated. If a calibrated transducer is moved from one transceiver to another, you must still calibrate the transducer on the "receiving" transceiver. If a calibrated transducer is removed, and then later reconnected to the same transceiver, the calibration data exist. A new calibration is not required.

Related tasks

Calibration procedures for velocity measurements, page 426

Related dialog boxes

Calibration Wizard dialog box #2 (Select Channel), page 440

Calibration Wizard dialog box #3 (Process Data), page 441

Calibration Wizard dialog box #2 (Select Channel)

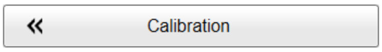
The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

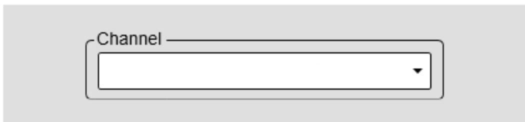
How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**.

Description



Select channel for calibration.In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.The velocity measurement channels are by default named “ADCP”. Target strength measurement channels are named ES -Echo Sounder. The same transducer can be used for both purposes, however be sure to select the right type of channel for calibration in accordance with operation.

Important

Velocity measurement calibration is always performed using replay data or reprocessing of calibration data.

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to *Passive* mode. You must do this *before* you start the calibration process. To select *Passive* mode, use the **Normal Operation** dialog box. The **Normal Operation** dialog box is located on the **Operation** menu.

If you calibrate with previously recorded echo data, the channel identification is recorded as a part of the raw data. You must still make sure that the correct channel is used.

Related tasks

Calibration procedures for velocity measurements, page 426

Related dialog boxes

Calibration Wizard dialog box #1(Start), page 439

Calibration Wizard dialog box #3 (Process Data), page 441

Calibration Wizard dialog box #3 (Process Data)

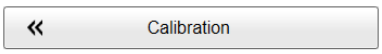
The third page in the **Calibration Wizard** allows you to import the calibration data into the calibration process. The calibration data recorded for each of the lines are processed separately. When the processing is finished, you can save the results, and update the calibration data used by the EK80.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the calibration wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and select **Calibration** on the **Setup** menu.



In the *first* **Calibration Wizard** dialog box, select **New calibration from raw data (Real time or Replay)**. This opens page 2. In the *second* page of the **Calibration Wizard** dialog box, select the channel to calibrate and select **Next** at the bottom of the page.

Description

The third page of the **Calibration Wizard** is divided into fields, one for each line of the calibration process. There are four lines in a velocity measurement calibration process. Each line has a set of calibration data stored. You can select all four lines to use in the calibration, or you can use only a subset of the lines. The fields are marked **L1**, **L2**, **L3** and **L4**.

A progress bar becomes visible in the dialog box during processing.

Details

Select File

Select **Select File** to open the operator system's File Manager. In the file manager you select the file(s) for velocity measurement calibration.You can select files for each of the lines in the ADCP run or a subset of the files and lines.

Start

Select **Start** to start the calculation of calibration values for a particular line of the ADCP run. A progress bar becomes visible in the dialog box during processing. It disappears when the processing is finished.

Ping Count

Ping Count displays the number of pings being included since the start of the calibration process. The number will accumulate as you process the calibration files for a particular line in the ADCP run.

Scale

Scale refers to the ratio of Speed Over Ground (SOG) from the GPS system versus ADCP. Ideally this value will be close to 1.

Yaw

Adjustment value for vertical rotation of the vessel. The value is based on the pings processed in the calibration.

Pitch

Adjustment value for horizontal rotation around an axis going from side to side of the vessel. The value is based on the pings processed in the calibration.

Roll

Adjustment value for horizontal rotation around an axis going from bow to stern of the vessel. The value is based on the pings processed in the calibration.

AverageScale

Scale refers to the ratio of Speed Over Ground (SOG) from the GPS system versus ADCP. Ideally this value will be close to 1.

Yaw

Adjustment value for vertical rotation of the vessel. The value is based on the pings processed in the calibration.

Pitch

Adjustment value for horizontal rotation around an axis going from side to side of the vessel. The value is based on the pings processed in the calibration.

Roll

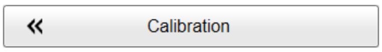
Adjustment value for horizontal rotation around an axis going from bow to stern of the vessel. The value is based on the pings processed in the calibration.

Related tasks

Calibration procedures for velocity measurements, page 426

Calibration function

The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.



Prerequisites

Calibration can only be started with the EK80 in either *Normal* or *Replay* mode.

How to open

This function is opened from the **Setup** menu.

Description

The EK80 echo sounder system is used for either target strength measurements or velocity measurements. Calibration is provided for both purposes, using entirely different methods of calibration. The **Calibration Wizard** will guide you through the steps according to what type of calibration you select.

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly.

In this context, the transducer beam is conically shaped with a cross-section area increasing with the depth. The cross-section is divided into "slices", and each slice represents a sector in the transducer. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

Any adjustments to the EK80are done automatically by the calibration program. No gain adjustments are required.

Tip

Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies. Each sphere diameter is selected for minimum temperature dependence.

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Calibration for EK80 velocity measurements requires the use of a global positioning system (GPS) and an ADCP transducer. The calibration method involves collecting data from the GPS and ADCP transducer while traversing at set of courses forming a pattern resembling an “L”. The vessel traverses a course of 400 to 800 meters at a constant compass heading and speed then a new course of the same length is traversed at a heading approximately 180 degrees from the previous pass. You must do this twice creating a total of four lines. Traversing the same distance in opposite directions helps to ensure that no directional bias is introduced.The data collected is used in the **Calibration Wizard** to calculate correction values for the ADCP velocity measurements.

The ratio of Speed Over Ground (SOG) from the GPS and SOG from the ADCP is used to correct the measurements from the ADCP. Average differences for pitch, roll and yaw are also used to correct the ADCP measurements.

Note

Velocity measurement calibration is always performed using replay data or reprocessing of calibration data. It is very important that you choose the correct channel for calibration as the calibration process differs greatly between velocity measurements and target strength measurements. The velocity measurement channels are by default named “ADCP”.

Calibration Wizard

The **Calibration Wizard** offers a set of dialog boxes to guide you through the calibration process.

1. The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.
2. The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.It is very important that you choose the correct channel for calibration as the calibration process differs greatly between velocity measurements and target strength measurements.
3. The third page, and the following pages, in the **Calibration Wizard** will be specific for the different calibration processes for velocity measurements and target strength measurements.

Note

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process. To select Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

Related tasks

Calibration procedures, page 376

Calibration procedures for velocity measurements, page 426

Related topics

Calibration for target strength measurements, page 371

Calibration for velocity measurements, page 422

Related dialog boxes

Calibration functions and dialog boxes, page 394

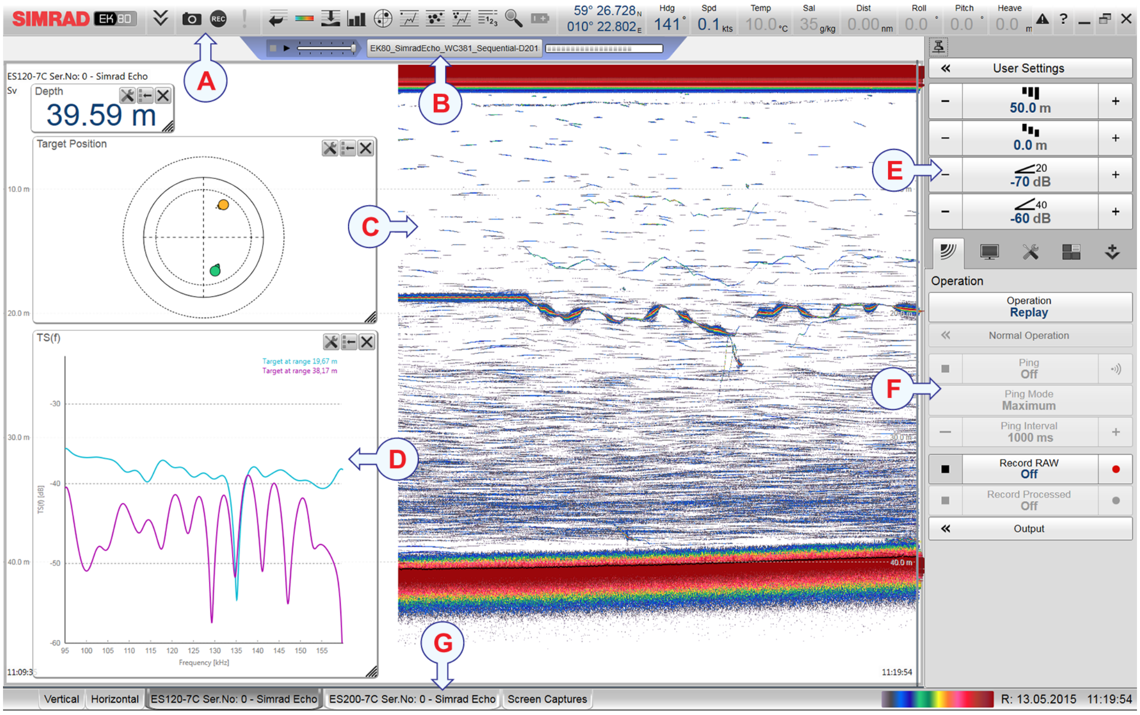
Calibration functions and dialog boxes for velocity measurements, page 439

User interface

Topics

EK80 user interface familiarization

By default, the EK80 presentation covers the entire screen. The visual elements provide you with the echo information you need, they help you to control the functionality needed to understand this information, and finally, they allow you to control the operational parameters.



This EK80 screen capture shows you a typical data replay situation. You can see one echogram view, and several information panes. The top bar shows you navigational information as well as buttons for key functions and information panes. The menu system on the right side gives you easy access to all the functionality offered by the EK80.

A **Top bar**

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

B **Replay bar**

During replay, the dedicated replay bar is shown immediately under the top bar. The replay bar allows you to retrieve saved files, and to control the playback.

C **Echogram views**

By default, you have one echogram for each frequency channel. You can choose which type of echogram you wish to see. If you have more than one frequency channel, the echograms for each channel can be presented horizontally with one over the other, or vertically next to each other. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D **Information panes**

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. You can change the appearance of the information panes to suit your preferences. You can change the transparency and the physical size of each pane.

E **Main menu**

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. By default, the **Main** menu is open. It is placed on the right side of the EK80 presentation. On the top bar, use the **Menu** button to hide or show the menu.

F **Secondary menus**

Below the **Main** menu you find the icons for opening (and closing) the secondary menus. Select an icon to open the relevant menu, and reselect the icon to close the menu.

G **Bottom bar**

The bottom bar is located at the bottom of the EK80 presentation and stretches from the far left to the far right. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

Related topics

User interface introduction, page 60

Top bar

Topics

Top bar overview

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help. And more importantly, from the top bar you can see when data recording is active.

A **Logo and product name**

This information identifies the brand and the product.

B **Menu button**

Select this button to hide or show the menu.

C **Screen Capture / Event / Record**

Select **Screen Capture** to make a screen dump of the current EK80 presentation. Select **Event** to initiate an event annotation on the echogram. The **Record** indicator shows you when recording is active.

D **Information panes**

Each information pane is opened and closed with its dedicated button on the top bar.

E **Navigational information**

These fields are separate read-outs that presenting useful information related to the vessel and/or EK80 navigation and operation. The information shown on the EK80 top bar must not be used for vessel navigation.

F **Messages button**

By flashing, **Messages** shows you that the EK80 has issued a message. The colour of the triangle reflects the severity of the most serious message. Select to open the **Messages** dialog box.

G **Operating system buttons**

Select to open the context-sensitive help, to minimize and maximize the presentation window, and to close the EK80 program.

Logo and product name

The brand logo and product name are shown on the left side of the top bar.

Description

This information identifies the brand and the product.

Double-click the logo to reduce the size of the EK80 presentation.
Double-click one more time to return to full screen presentation.

Menu button

Menu is located on the left side of the top bar. This is an "on/off" function.

Description

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the EK80 presentation. This gives you more space for echo information.

To hide the menu, select **Menu** on the top bar. To retrieve the menu, select **Menu** one more time.

When the menu is hidden, it is temporarily shown on the left or right side of the EK80 presentation if you move the cursor to that position.

Tip

The **Menu on the right side** *option is provided in the* **Display Options** *dialog box. Select this option to place the menu system on the right side of the EK80 presentation. This is the default setting. By deselecting this function, the entire menu system is placed permanently on the left side of the EK80 presentation.*

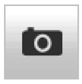
Related topics

Defining settings related to user preferences and individual customizing, page 245

Screen Capture button

While using the EK80 you may wish to make a screen capture to save an instantaneous copy of the current presentation.

Description



Select **Screen Capture** to make a screen dump of the current EK80 presentation.

Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. To view the images you have saved, select **Screen Captures** on the bottom bar. This opens the built-in image browser which allows you to retrieve the images.

Tip

Before you make the screen capture, you may wish to place an event marker on the echogram. The event marker may be useful later to identify the information.

Related topics

Saving and recalling screen captures, page 148

Record indicator description

A key function of the EK80 is it ability to record echo data. Use the raw data recording functionality provided by the EK80 to save echo data using the `*.raw` format. The data files can be played back on the EK80. You can keep the recorded files for scientific studies, future references or for training purposes.

Description

The **Record** indicator shows you when recording is active. The indicator is red when recording is in progress.

The **Record RAW** button allows you to start and stop recording, split the current recording file (if it gets too large), and set up the file output parameters. Once all the recording parameters have been defined, you can start recording by clicking the red circle on the button, and stop it by clicking the left rectangle. **Record RAW** is located on the **Operation** menu.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

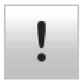
Related topics

Recording and replaying raw echo data, page 127

Event button description

An event is a type of annotation that you can add to the echogram. You can use an event to identify echoes of special interest, or when something special happens. Events may be triggered by external devices, set by a timer, or initiated by selecting the **Event** button on the top bar.

Description



The **Event** button is used to initiate an event annotation on the echogram. To set up the event type, use the options on the **Annotations** page.

Tip

The **Annotations** *page is located in the* **Installation** *dialog box. The* **Installation** *dialog box is located on the* **Setup** *menu.*

Information panes overview

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Select the relevant button on the top bar to open the information pane. In most cases, the data in the information pane is only valid for the selected channel. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

The EK80 offers the following information panes (from left).

- *History*

  The *History* information pane allows you to view previously recorded echogram sequences. Do not confuse this function with the recording functionality. The *History* function saves the echogram images automatically on the Processor Unit hard disk The information in the *History* presentation is the same as on the original echogram presentation.

- *Colour Scale*

  The *Colour Scale* information pane allows you to view the current colour scale in use, and to make changes to the echo levels it presents.

- *Depth*

  The *Depth* information pane provides the water depth in the current echogram view. If you have several echogram views open, you can place one pane in each view.

- *Bottom Hardness*

  The *Bottom Hardness* information pane shows you the current bottom reflectivity. This indicates what type of bottom you have under your keel. The value is calculated using the bottom echo strength in the current ping.

- *TS (Target Strength) Histogram*

  The *TS Histogram* information pane shows a histogram of the echoes detected from single fishes. The histogram presents the actual size of the fish in weight or length, or with echo strength (shown in dB). The *TS Histogram* information pane only works when you have a split-beam transducer.

- *Target Position*

  The *Target Position* information pane shows the position of the detected single target echoes. The current ping (largest circles) and the three previous ping (smaller circles) are shown. The view is "from above". The colours indicate the echo strength. The *Target Position* information pane only works when you use of a split-beam transducer.

- *TS(f)*

  The *TS(f)* information pane offers an analysis of the target strength for single targets versus frequency. The algorithms use settings from the **Single Target Detection** dialog box. The information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.

- *Biomass*

  The *Biomass* information pane displays an index of the biomass in the current view. The biomass index is the s_A value, or *Nautical area scattering coefficient* (NASC), measured with unit m^2/nmi^2.

- *Sv(f)*

  The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them. The information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.

- *Numerical*

  The *Numerical* information pane offers a numerical and graphical presentation of all the various parameters applicable for the current mode and operation. Information about transducer, environment and current layers are included. The currently active layer is identified with red text.

- *Zoom*

  The *Zoom* information pane allows you to magnify a chosen area of the current echogram.

- *Transceiver Power Supply*

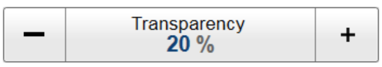
  The transceiver may be powered by an external power source. If the transceiver runs of a battery, you must monitor the supply voltage. The *Transceiver Power Supply* information pane shows you the current supply voltage provided to the transceiver.

- *ADCP*

  The *ADCP* information pane displays velocities in horizontal and vertical direction. The horizontal velocity information is displayed in a compass. This information pane is available only when ADCP is activated.

Tip

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size.
The **Transparency** *function allows you to adjust how much you are able to see "through" the information panes you have opened. The* **Transparency** *function is located on the* **Display** *menu.*



Related topics

Information panes, page 462

Navigational information

The navigational information is located in the middle of the top bar. To choose which information to be displayed on the top bar, use the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

These fields are separate read-outs that presenting useful information related to the vessel and/or EK80 navigation and operation.

Note

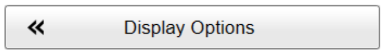
The information shown on the EK80 top bar must not be used for vessel navigation.

The following colours are used to indicate the quality of the information:

- **Blue**: The information is good.
- **Yellow**: The information contains manually overwritten values.

Tip

Which navigation elements to see on the top bar is selected in the **Display Options** *dialog box.*



To set up the various operational parameters related to navigational inputs, open the **Installation** *dialog box, and investigate the functionality related to sensor interfaces.*

Topics

Geographical position read-out, page 455

Heading read-out, page 456

Speed read-out, page 456

Temperature read-out, page 457

Distance read-out, page 457

Salinity read-out, page 458

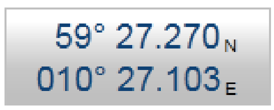
Motion read-outs (roll, pitch and heave), page 459

Depth read-out, page 459

Geographical position read-out

When enabled, the vessel's current geographical position is shown on the top bar.

Prerequisites



To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

If a positioning sensor (GPS) is connected to the EK80, the top bar can show you the vessel's geographical position in longitude and latitude.

Note

The information shown on the EK80 top bar must not be used for vessel navigation.

Related topics

Defining settings related to user preferences and individual customizing, page 245

Heading read-out

When enabled, the vessel's current heading is shown on the top bar.

Prerequisites

To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

If a heading sensor (gyro compass) is connected to the EK80 Processor Unit, the top bar may show you the vessel's current heading.

Note

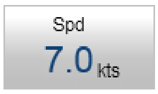
The information shown on the EK80 top bar must not be used for vessel navigation.

Related topics

Defining settings related to user preferences and individual customizing, page 245

Speed read-out

When enabled, the vessel’s current speed is shown on the top bar.



Prerequisites

To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

Provided that a speed log sensor is interfaced to the EK80, the vessel’s current speed can be presented in the user interface.

Tip

By default, the vessel speed is shown in knots. You can change the unit of measurement on the **Units** *page. The* **Units** *page is located in the* **Installation** *dialog box.*

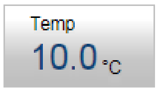
Related topics

Defining settings related to user preferences and individual customizing, page 245

Temperature read-out

The navigational information on the top bar may include a read-out of the current water temperature.

Prerequisites



To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

If a suitable sensor is connected to the EK80 Processor Unit, the top bar may show you the current temperature. The function is offered to allow you to monitor the water temperature, but it will display any temperature reading that is made by the sensor.

Tip

By default, the temperature is shown in Celcius. You can change the unit of measurement on the **Units** *page. The* **Units** *page is located in the* **Installation** *dialog box.*

If you define a manual temperature value in the **Environment** dialog box, it is shown in the **Temperature** read-out. The **Environment** dialog box is opened from the **Setup** menu.

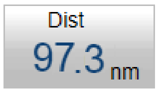
Related topics

Defining settings related to user preferences and individual customizing, page 245

Distance read-out

When enabled, the navigational information on the top bar includes a read-out of the vessel's sailed distance.

Prerequisites



To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

If a relevant sensor is connected to the EK80 Processor Unit, the top bar will show you the vessel's sailed distance.

Tip

The distance is by default shown in nautical miles. You can change the unit of measurement on the **Units** *page. The* **Units** *page is located in the* **Installation** *dialog box.*

The information shown on the EK80 top bar must not be used for vessel navigation.

Related topics

Defining settings related to user preferences and individual customizing, page 245

Salinity read-out

The navigational information on the top bar may include a read-out of the current salinity.

Prerequisites

To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

The top bar may show you the current water salinity.

To provide the current salinity, use the **Environment** dialog box. Input any salinity value between 0 to 40 PSU. The salinity value you provide is an important parameter used to calculate the sound speed and the absorption curve. The **Environment** dialog box is opened from the **Setup** menu.

> Conceptually the salinity is the quantity of dissolved salt content of the water. [...] Seawater typically has a salinity of around 35 g/kg, although lower values are typical near coasts where rivers enter the ocean. Rivers and lakes can have a wide range of salinities, from less than 0.01 g/kg to a few g/kg, although there are many places where higher salinities are found.
>
> *https://en.wikipedia.org/wiki/Salinity, April 2016*

Related topics

Defining settings related to user preferences and individual customizing, page 245

Motion read-outs (roll, pitch and heave)

When enabled, the navigational information on the top bar includes the vessel’s current roll, pitch and heave movements.

Prerequisites

To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

If a suitable motion reference unit (MRU) sensor is connected to the EK80 Processor Unit, the top bar can show you the vessel's current movements. The roll and pitch information is always shown in degrees.

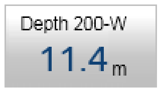
Related topics

Defining settings related to user preferences and individual customizing, page 245

Depth read-out

If enabled, the current water depth is shown on the top bar.

Prerequisites



To see this information on the top bar, you must enable it using the **Top Bar** functions in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

Description

The current depth measured by one of the transceiver channels is shown on the top bar.

Which channel to use for the depth read-out is selected in the **Display Options** dialog box. The chosen channel is identified in the read-out rectangle. The **Display Options** dialog box is located on the **Display** menu. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Tip

By default, the depth is shown in metres. You can change the unit of measurement on the **Units** *page. The* **Units** *page is located in the* **Installation** *dialog box.*

Related topics

Defining settings related to user preferences and individual customizing, page 245

Messages button description

The **Messages** button is located on the right side of the top bar.

Description

A new message is flagged with the **Messages** button on the top bar. The button is flashing to draw your attention. The colour of the triangle reflects the severity of the most serious message.

- **Yellow**: This indicates a warning.
- **Red**: This indicates an alarm.

If you hold the cursor over the button, a short list of the current messages is shown.

Select to open the **Messages** dialog box.

Help button description

The **Help** button is located on the right side of the top bar.

Description

Select this button to open the EK80 context-sensitive help. The help system opens on its start page.

The context sensitive on-line help is provided using a *WebHelp* installation using HTML format. It uses the default web browser on the Processor Unit.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

The EK80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

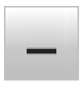
Tip

Help is also available from the various dialog boxes in the EK80 user interface. Select **Help** *[?] in the top right corner of a dialog box to open the context-sensitive help.*

Operating system button descriptions

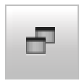
The operating system function buttons are located on the right side of the top bar. The buttons are **Minimize**, **Maximize** and **Close**.

Minimize button



Select this button to minimize the entire EK80 presentation. The program is then only shown as an icon on the operating system taskbar. To reopen, select the button one more time.

Maximize/Normalize button



Select this button to change the size of the EK80 presentation window. To restore the presentation to its previous size, select the button one more time.

Close button

Select this button to close the EK80 program.

Information panes

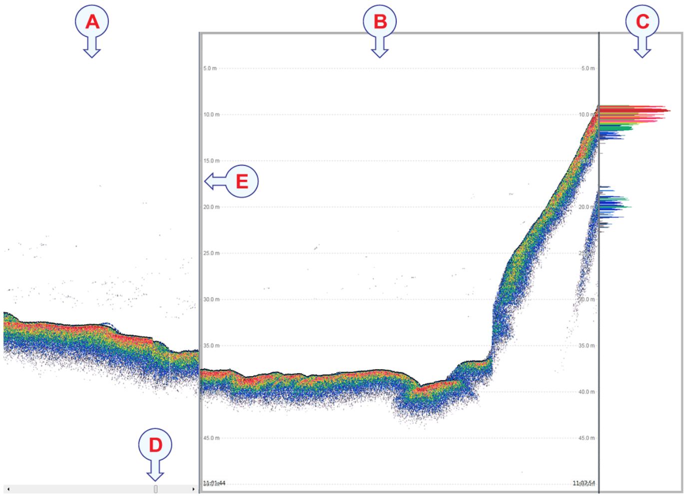
Topics

History information pane description

The *History* information pane allows you to view previously recorded echogram sequences. Note that this information pane does not use the same presentation method as the other panes.

How to open

To open the *History* information pane, select the button on the top bar. A dedicated view on the left side of the EK80 presentation opens to show you a history image. To *close* the *History* view, click this button one more time.



A *The History view*

This image is fixed, even if the echogram is scrolling sideways on the right hand side.

B *The active echogram presentation*

C *The active scope view presentation*

D *Click this button and drag it sideways to scroll through the recorded images*

E *Click this border and drag it sideways to change the size of the History view*

Description

The *History* function saves the echogram images automatically on the Processor Unit hard disk These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation.

In order to show you the recorded echograms, the echogram presentation is split in two. The right side will show you the active echogram, while the left side is used to display the recorded history. Move the slider button at the bottom of the presentation to view the full extent of the image.

Note

The number of history files is limited. After reaching the maximum number of files, the latest echogram picture overwrites the oldest one. The history function still allows you to quickly look through echogram pictures from several hours.

Every time the history file is saved to the hard disk, the pinging may be interrupted. It is therefore possible to disable the *History* function. You can also reduce the number of history files to save space on the computer's hard disk. These functions are located on the **File Setup** page in the **Output** dialog box. The **Output** dialog box is located on the **Operation** menu.

Related topics

Information panes, page 462
Recording and replaying raw echo data, page 127
Retrieving the latest echogram history, page 173
Disabling the automatic echogram history recording, page 174
File Setup page, page 632
Transparency function, page 588

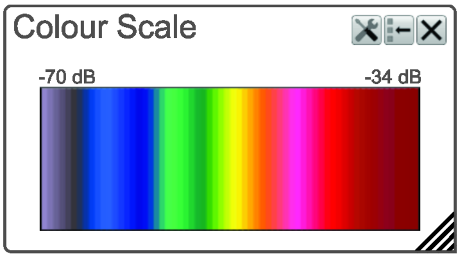
Colour Scale information pane description

The *Colour Scale* information pane allows you to view the current colour scale in use, and to make changes to the echo levels it presents.

How to open

To open the *Colour Scale* information pane, click in the chosen view to activate it, then select the **Colour Scale** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



The *Colour Scale* information pane shows you the current colour scale in use for the EK80 presentations. Note that additional functions related to the colour scales are available.

- **Colour Scale**

  The colour scales used by the EK80 are designed to reflect how strong the echoes are. The echo strength is measured in decibels (dB). In the basic colour scale with 12 colours, each colour represents a 3 dB step. This means that the entire scale covers 36 dB. The dynamic range of the EK80 is much larger. The **Colour Scale** parameters allow you to change the lower limit of colour scale range to match the current echoes.

- **Colour Setup**

  The **Colour Setup** dialog box controls the presentation colours used by the EK80. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation

- **Bottom bar**

  The colour scale is shown on the bottom bar even when the *Colour Scale* information pane is closed.

The following colour scales are available:

12 Colours

Sonar Colours

Smooth ES

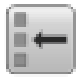
Grayscale

BI500 Colours

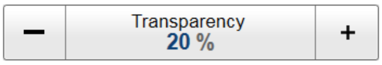
The **Smooth Echosounder** scale is based on the standard 12-colour scale. Additional colours have been added between them to make smoother colour transitions.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



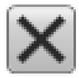
The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

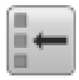
Close

Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.



Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Changing the colour scale in the EK80 presentations, page 175
Transparency function, page 588
Colour Scale page, page 724

Depth information pane description

The *Depth* information pane provides the water depth in the current echogram view. If you have several echogram views open, you can place one pane in each view.

How to open

To open the *Depth* information pane, click in the chosen view to activate it, then select the **Depth** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description

The depth measure by the selected channel is shown. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Tip

By default, the depth is shown in metres. You can change the unit of measurement on the **Units** *page. The* **Units** *page is located in the* **Installation** *dialog box.*

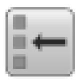
Selecting **Setup** in the *Depth* information pane opens the **Bottom Detection** page in the **Information Pane Options** dialog box. The purpose of the **Bottom Detection** parameters are to define the upper and lower depth limits most likely to be used during the EK80 operation.

Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column. Use the dedicated **Bottom Detection** *function.*

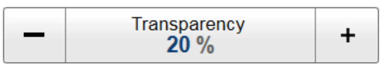
In certain situations the information pane may not display any data. In most cases, this is caused by improper settings. If this happens to you, observe the instructions in the small text message that appears.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.



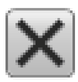
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

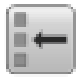
Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Opening the Depth information pane to read the current depth, page 177
Transparency function, page 588
Bottom Detection dialog box, page 621

Bottom Hardness information pane description

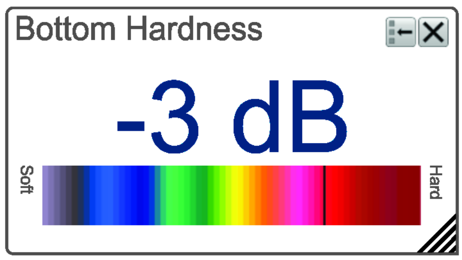
The *Bottom Hardness* information pane shows you the current bottom reflectivity. This indicates what type of bottom you have under your keel. The value is calculated using the bottom echo strength in the current ping.

How to open

To open the *Bottom Hardness* information pane, click in the chosen view to activate it, then select the **Bottom Hardness** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description

The bottom hardness shown in the information pane was detected by the latest ping in the selected view. The colours on the left side of the scale indicate a soft bottom, while the colours on the right hand side indicate a harder bottom. The vertical line in the hardness colour scale positions the latest ping. The current reflectivity is also shown measured in dB.



Tip

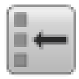
The Hardness Line can be added to your echogram to retrieve additional information. It appears as thick colour coded line that follows the bottom contour. This line does not remove information, it simply "pushes" the echo information further down in order to show you the bottom reflectivity.

When you study the bottom hardness, you can learn more about the bottom. Certain species are known to prefer specific bottom conditions. With more knowledge, you are better qualified to estimate the possible catch.

Tip

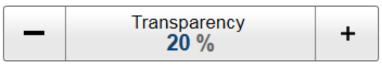
In certain situations the information pane may not display any data. In most cases, this is caused by improper settings. If this happens to you, observe the instructions in the small text message that appears.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.



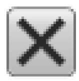
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



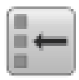
Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size



You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Investigating the bottom characteristics, page 178
Transparency function, page 588

TS (Target Strength) Histogram information pane description

The *TS Histogram* information pane shows a histogram of the echoes detected from single fishes. The calculations are based on the fact that different fish species have different echo strength. The echo strength also depends on the operating frequency you use. The histogram presents the actual size of the fish in weight or length, or with echo strength (shown in dB).

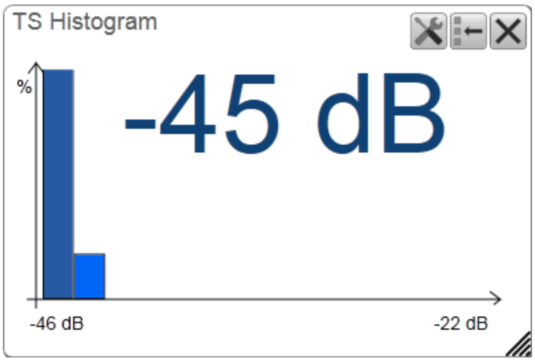
Prerequisites

The *TS Histogram* information pane only works when you have a split-beam transducer.

How to open

To open the *TS Histogram* information pane, click in the chosen view to activate it, then select the **TS Histogram** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



The *TS Histogram* information pane shows a histogram of the single fish echoes that are detected. The calculations are based on the parameters you have selected in the **Calculation Interval** dialog box. It thus provides a visual indication on how large the individual fishes are within the chosen interval.

Only the fishes detected by the current channel are shown. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

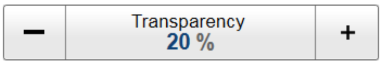
The target strength shown is an average value. For an accurate X-axis value, place the cursor on the axis, and read the value from the tooltip label.

By selecting **Setup** in the information pane, the **TS Histogram** page opens. Use the **TS Histogram** page to define the properties for the histogram shown in the *TS Histogram* information pane. The **TS Histogram** page is located in the **Information Pane Options** dialog box. The **Information Pane Options** dialog box is located on the **Active** menu.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

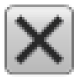
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Changing the calculation parameters for the TS Histogram information pane, page 179
Transparency function, page 588
Calculation Interval dialog box, page 599

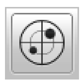
Target Position information pane description

The *Target Position* information pane shows the position of the detected single target echoes. The current ping (largest circles) and the three previous ping (smaller circles) are shown. The view is "from above". The colours indicate the echo strength.

Prerequisites

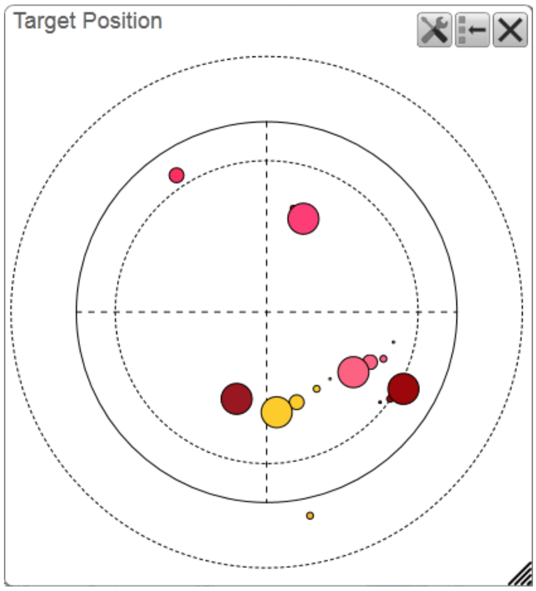
The *Target Position* information pane only works when you use of a split-beam transducer.

How to open



To open the *Target Position* information pane, click in the chosen view to activate it, then select the **Target Position** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



Each circle in the information pane identifies a single target (fish). You can observe how these move through the EK80 beam. The colours of the circles are the same as the colours used in the colour scale, and these indicate the echo strength from each fish.

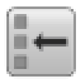
The three circles in the information pane identifies the operational frequencies if and when you work with a wide band transceiver. The dotted inner circle identifies the highest frequency in the sweep. The circle between them identifies the centre frequency.

Tip

If you open the Target Position information pane next to the TS(f) information pane, you will see that each target in one pane is also shown in the other using the same colour code for echo strength.

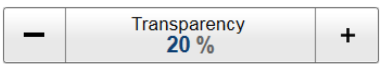
By selecting **Setup** in the information pane, the **Single Target Detection** page opens.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.



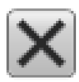
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size

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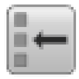


Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Transparency function, page 588

TS(f) information pane description

The *TS(f)* information pane offers an analysis of the target strength for single targets versus frequency. The algorithms use settings from the **Single Target Detection** dialog box.

Prerequisites

The *TS(f)* information pane can only be used when **Pulse Type** is set to *FM* in the **Normal Operation** dialog box.

How to open

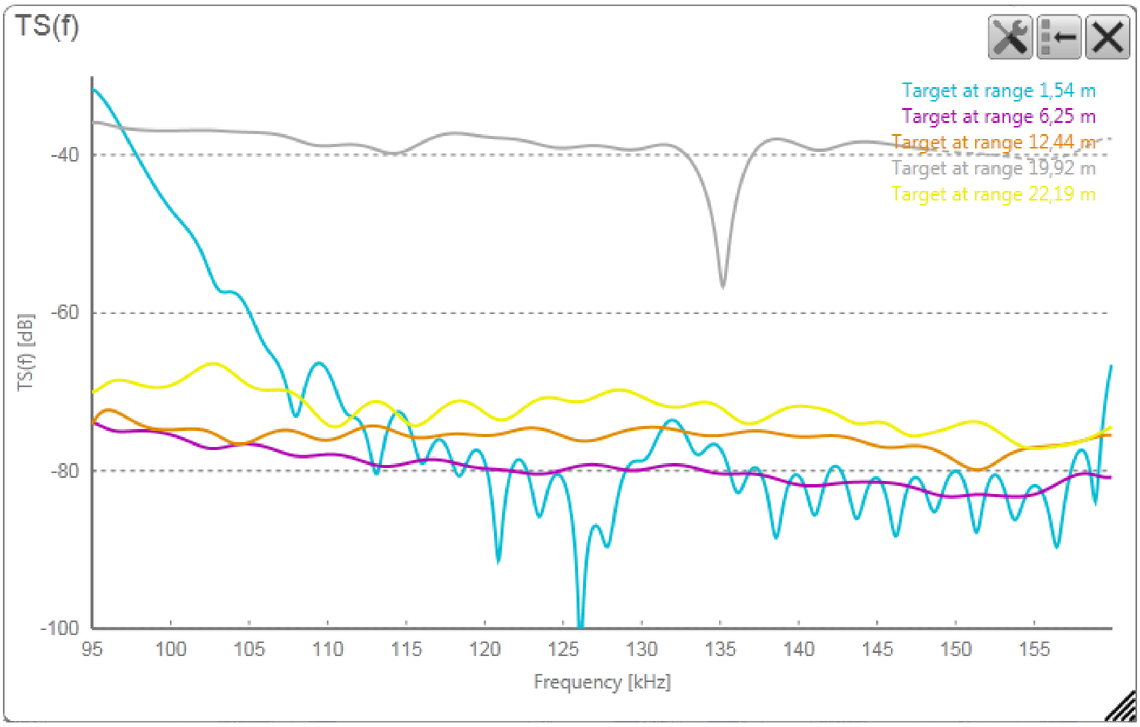
To open the *TS(f)* information pane, click in the chosen view to activate it, then select the **v** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description

The *TS(f)* information pane is a plot that shows the how echo strength for individual targets change with the operational frequency. The pane allows you to identify the nature of the individual targets, and discriminate between them.

Tip

In order to study individual targets, we recommend that you confine the targets to a dedicated layer to isolate the interesting echoes. The layer would then for example "highlight" single targets within the layer. Without this layer the default background layer will be used, but it may often offer too much data from other echoes.



This screen capture example shows the frequency response from different targets. Each target is shown in a different colour, and the range to each target is shown in the upper right corner of the pane. The horizontal curve (grey) at the top of the pane shows the frequency response from a calibration sphere. The three almost identical curves are probably jellyfish, while the dynamic curve (blue) is a random fish passing under the sphere.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

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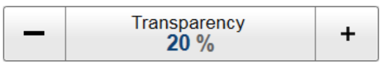
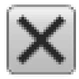


Details

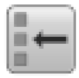
Close

Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.



Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

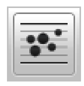
Information panes, page 462
Increasing the visibility of the information panes, page 246
Transparency function, page 588
Single Target Detection dialog box, page 624

Biomass information pane description

The *Biomass* information pane displays an index of the biomass in the current view. The biomass index is the s_A value, or *Nautical area scattering coefficient* (NASC), measured with unit m^2/nmi^2.

How to open

To open the *Biomass* information pane, click in the chosen view to activate it, then select the **Biomass** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.



Description

The digit shown in the *Biomass* information pane is a calculated index.

If more than one target is located in the acoustic beam at the same depth, it is not usually possible to resolve them separately. This is often the case with schooling fish or aggregations of zooplankton. In these cases, echo integration is used to estimate biomass. Echo integration assumes that the total acoustic energy scattered by a group of targets is the sum of the energy scattered by each individual target. This assumption holds well in most cases. The total acoustic energy backscattered by the school or aggregation is integrated together, and this total is divided by the (previously determined) backscattering coefficient of a single animal, giving an estimate of the total number.

http://en.wikipedia.org/wiki/Fisheries_acoustics, March 2015

The EK80 records all the targets from the smallest plankton to the largest whale. The biomass value is an indicator to how much fish you currently have in the beam. Every single fish will emit an echo, and the sum of all these registered echoes are presented as a number. Smaller organisms such as plankton will also emit echoes, but these are so weak that they will hardly influence on the total biomass.

The biomass value provides you with information about the fish abundance, and as such it may help you to decide if it pays off to start fishing. However, you must consider if the biomass value is a result of large amounts of plankton or bait, or if you have "real fish" below the keel. The biomass value is relative, and after some use your experience will be a valuable factor when the decision is made.

It is possible to convert the biomass index to weight (for example in metric tons). However, this is a complicated process that includes mathematical equations and scientific data.Based on practical use of the EK80 on different species and habitats, you will soon be able to estimate the weight based on experience.

Note

If you have other echo sounders or sonars running asynchronous with the EK80, these systems may cause interference. The EK80 may detect and measure the transmit pulses from other hydroacoustic systems, and these pulses have an effect on the biomass calculations. To avoid all interference, a full synchronization of the various acoustic instruments is required. If your own vessel produces excessive noise this will also be taken into the biomass calculations and give you inaccurate data.

In certain situations the information pane may not display any data. In most cases, this is caused by improper settings. If this happens to you, observe the instructions in the small text message that appears.

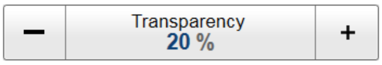
Tip

A biomass line can be added to your echogram to retrieve additional information. This function writes an extra thick and brightly coloured curve on the echogram. The biomass line shows you the integrated biomass for the pings within the selected calculation interval. Change the scale to fit the vertical space available on the echogram. To add the biomass line to the echogram and change the scale, open the **Lines** *page in the* **Echogram** *dialog box.*

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

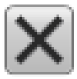
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Investigating the biomass, page 180
Changing the calculation parameters for the Biomass information pane, page 181
Transparency function, page 588
Calculation Interval dialog box, page 599

Sv(f) information pane description

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them. The *Sv(f)* information pane can only be used when **Pulse Type** is set to *FM* in the **Normal Operation** dialog box.

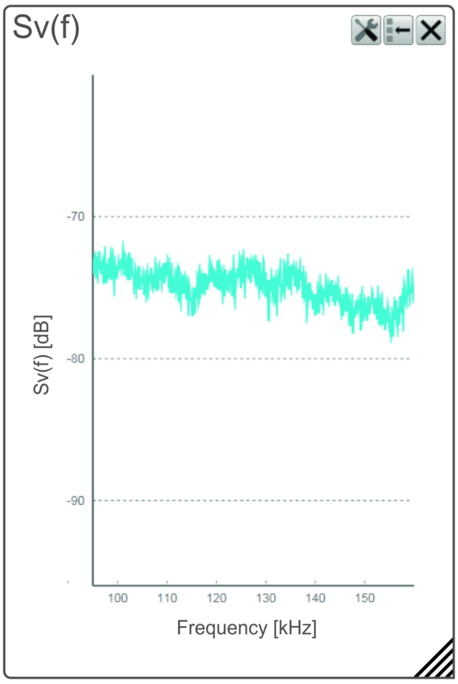
Prerequisites

The *Sv(f)* information pane can only be used when **Pulse Type** is set to *FM* in the **Normal Operation** dialog box.

How to open

To open the *Sv(f)* information pane, click in the chosen view to activate it, then select the **Sv(f)** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



The *Sv(f)* information pane is a plot. It shows the how echo strength for a group of targets (for example a school of fish) changes with the operational frequency. The pane allows you to identify the nature of the schools, and discriminate between them.

Tip

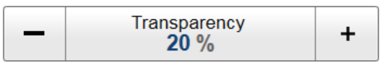
In order to study the targets in a volume of water, we recommend that you confine the targets to a dedicated depth layer to isolate the interesting echoes. The layer would then for example "highlight" a school of fish. Without this layer the default background layer will be used, but it may often offer too much data from other echoes.

In order to collect information from more than one channel in the *Sv(f)* information pane, you can use the **Combined View Settings** functionality to "combine" echo data from several channels. The **Combined View Settings** dialog box lists all your current channels. On the left side of the dialog box, select which channels to be included in the combined *Sv(f)* information pane. On the right side, select which channel to be included in the dedicated channel view.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

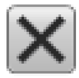
The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

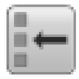
Close

Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.



Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Creating a *Sv(f)* information pane with echo data from multiple channels, page 182
Combined View Settings, page 628
Transparency function, page 588

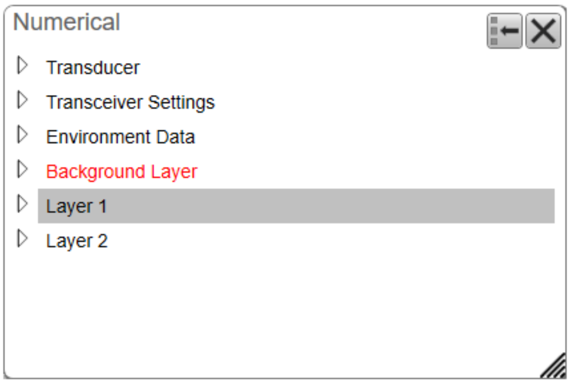
Numerical information pane description

The *Numerical* information pane offers a numerical and graphical presentation of all the various parameters applicable for the current mode and operation. Information about transducer, environment and current layers are included. The currently active layer is identified with red text.

How to open

To open the *Numerical* information pane, click in the chosen view to activate it, then select **Numerical** on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



The information in the *Numerical* information pane is organized in collapsible lists. Each list can be opened or closed using the small triangle on the left side.

- **Transducer list**:The **Transducer** list contains information related to the transducer in use on the relevant channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.
- **Transceiver list**: The **Transceiver** list contains information related to the Transceiver in use on the relevant channel.
- **Environment list**: The **Environment** list contains information related to the environment for the relevant echogram channel.
- **Background layer list**: The **Background Layer** list contains acoustic data related to the default background layer. This layer covers the entire water column defined by the range setting on the **Main** menu.
- **Layer list**: The **Layer** list contains acoustic data related to a specific layer. This layer covers the range you defined in the **New Layer** dialog box. When the layer is "active" the data is shown with red colour.

The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

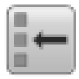
Tip

To create a new layer, use the **New Layer** *dialog box.*

Once a depth layer has been made you can change its properties using the **Layer Properties** *dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view.*

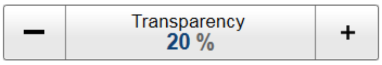
To delete a layer, select it in the echogram or in the Numerical information pane (layer data shown with red text), and then click **Delete Layer**.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.



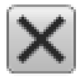
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



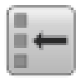
Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size



You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

Topics

Transducer list, page 481

Transceiver list, page 482

Environment list, page 483

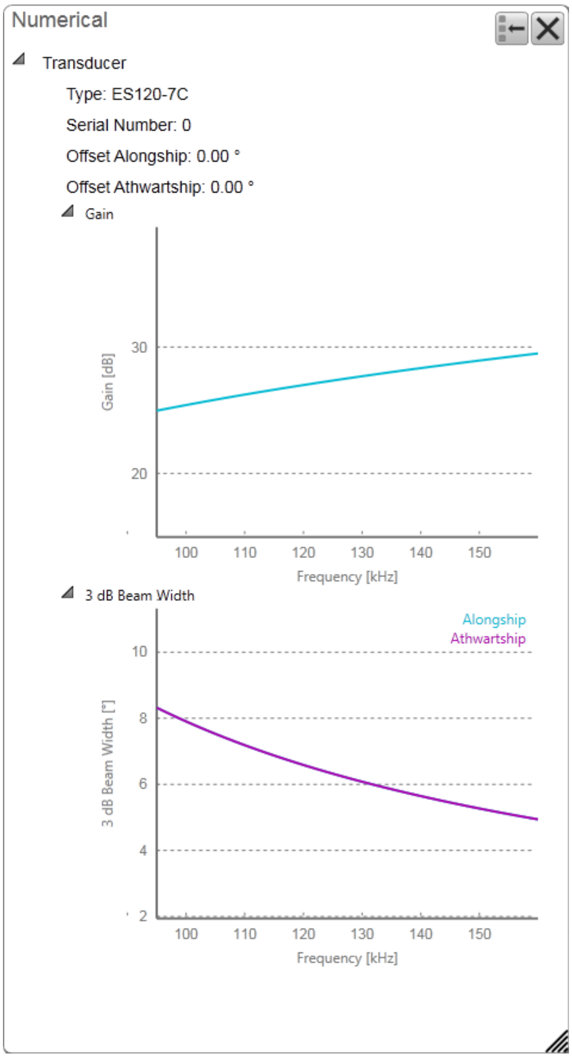
Background layer list, page 484

Layer list, page 485

Transducer list

The **Transducer** list contains information related to the transducer in use on the relevant channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Description



The following information is provided in the **Transducer** list. Some of the settings are specific for echo sounder or ADCP operation.

- **Model**: This information identifies the type of transceiver in use.
- **Type**: The transducer model is identified.
- **Serial Number**: This is the serial number of the transducer in use on the current channel. The information assumes that you have typed in the serial number when you installed the transducer in the EK80 user interface. This serial number is very important, because you will need it as a reference identification when the EK80 is calibrated.
- **Offsets**: These parameters identify the alongship and athwartship offset angles for the transducer. These offset angles are taken from the calibration results.
- **Gain**: This curve shows the transducer gain (in dB) for different operational frequencies.
- **3dB Beamwidth**: This curve shows the transducer beamwidth (in degrees) for different operating frequencies.
- **Sa correction**: S_a is the *area backscattering strength*. The value reflects the corrections made after the EK80 calibration.
- **Beamwidth**: These are the beamwidths in the alongship and athwartship directions.

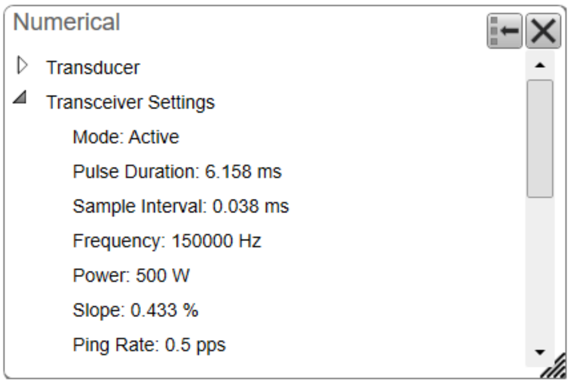
Related topics

Numerical information pane description, page 478
Information panes, page 462

Transceiver list

The **Transceiver** list contains information related to the Transceiver in use on the relevant channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Description



The following information is provided in the **Transceiver** list. Some of the settings are specific for echo sounder or ADCP operation.

- **Mode**: The operating mode is controlled by **Operation** on the **Operation** menu. You can set it to *Normal*, *Replay* or *Inactive*. To activate *Mission* mode a mission plan must have been created previously. The current operating mode is also shown in the **Extras** menu.
- **Pulse Duration**: The **Pulse Duration** setting specifies the current duration ("length") of the transmitted pulse. You can manually select a pulse duration that suits your operation. This setting is controlled in the **Normal Operation** dialog box. The current setting of this parameter is also shown in the **Extras** menu.
- **Sample Interval**: The information from each EK80 transducer is a continuous flow of analogue data. In signal processing, *sampling* is the reduction of this continuous signal to a discrete signal.We convert a sound wave (which is an analogue *continuous-time signal*) to a sequence of samples (which is a *discrete-time signal*). The *sample rate* is the average number of samples obtained in one second. The *sample interval* is 1/*sample rate* to allow readout in time (normally milliseconds).
- **Frequency**: This setting is controlled in the **Normal Operation** dialog box. The **Start Frequency** and **End Frequency** parameters are used to set up a frequency sweep ("chirp"). If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wide band transmissions. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.
- **Power**: The **Power** parameter in the **Normal Operation** dialog box displays the transmitter's output power measured in Watts. You can change the output power manually. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest.
- **Slope**: The **Slope** value identifies how fast the output power in each transmission ("ping") goes from 0 to maximum. The value (in %) indicates the amount of the pulse duration that is spent during this increase. For example, if the **Slope** value is 50%, it means that half the duration of the "ping" is spent building up the power to maximum.
- **Ping rate**: The phrase *ping rate* is used to describe the parameter that controls how often the EK80 can or shall transmit acoustic energy (a "ping") into the water. The ping rate is normally limited by the maximum range settings. It will also be dependant

on hardware issues. This may be, for example, how fast your Processor Unit can handle the information from each ping, how fast your system communicates with external peripherals, or how long time the system uses to save data. The *ping interval* (1/ping repetition frequency (PRF)) is the ping rate measured in time between each transmission.

Related topics

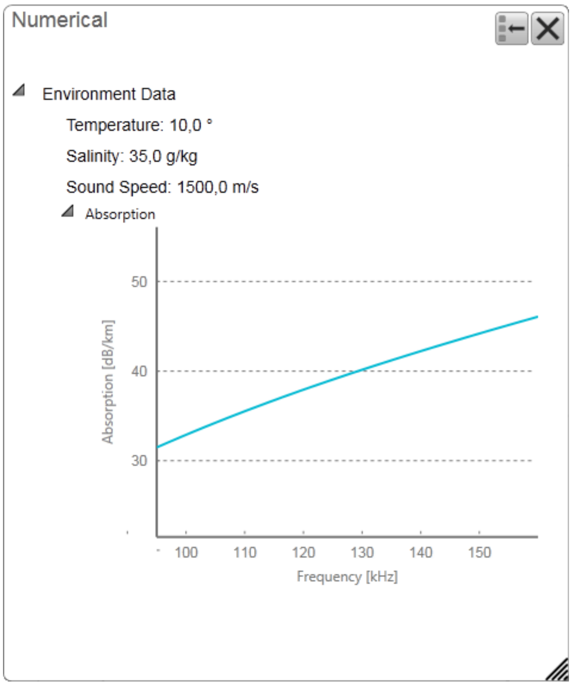
Numerical information pane description, page 478
Information panes, page 462

Environment list

The **Environment** list contains information related to the environment for the relevant echogram channel.

Description

- **Temperature**: This is the current water temperature. It reflects the temperature you have provided in the **Environment** dialog box. The temperature value you provide is an important parameter used to calculate the sound speed and the absorption curve.
- **Salinity**: This is the current water salinity. It reflects the salinity you have provided in the **Environment** dialog box. The salinity value you provide is an important parameter used to calculate the sound speed and the absorption curve.
- **Sound Speed**: This is the sound speed calculated by the EK80.



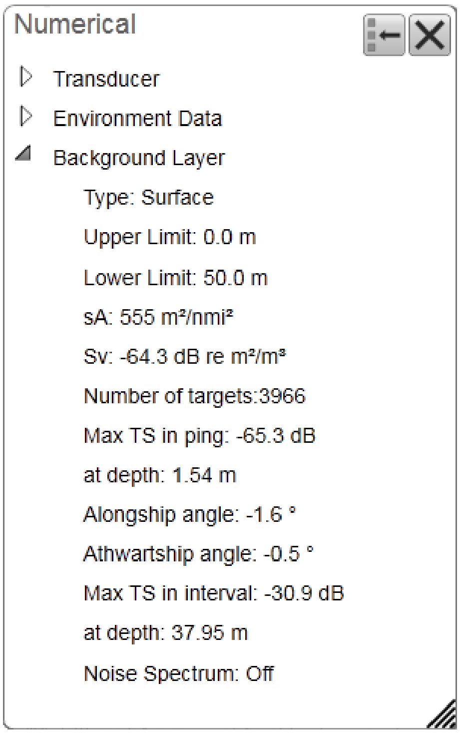
Related topics

Numerical information pane description, page 478
Information panes, page 462

Background layer list

The **Background Layer** list contains acoustic data related to the default background layer. This layer covers the entire water column defined by the range setting on the **Main** menu.

Description



The following information is provided in the **Background layer** list. Some of the settings are specific for echo sounder or ADCP operation.

- **Type**: This identifies the echogram type in use.
- **Upper Limit** / **Lower Limit**: These parameters identify the depth range covered by the layer.
- **sA**: $\mathbf{s_A}$ is the *nautical area scattering coefficient*. $\mathbf{s_A}$ is commonly abbreviated as *NASC*. In this context the $\mathbf{s_A}$ value presents the current biomass index.
- **Sv**: $\mathbf{S_v}$ is the *volume backscattering strength*. $\mathbf{S_v}$ is commonly abbreviated as *VBS*. The $\mathbf{S_v}$ value identifies the total volume backscatter in the depth layer.
- **Number of targets**: This information identifies the number of individual targets (single fish) in the depth layer.
- **Max TS in ping ... at depth**: These parameters identify the strongest target strength detected, and at which depth.
- **Alongship angle** / **Athwartship angle**: These parameters identify the alongship and athwartship offset angles for the transducer. These offset angles are taken from the calibration results.
- **Max TS in interval ... at depth**: These parameters identify the strongest target strength detected, and at which depth.
- **Noise Spectrum**: This information is only valid for FM transmissions. The value reflects an estimation of the noise level over the transducer bandwidth. This information is useful for identifying noise sources in both *Passive* and *Active* transmission modes.

Related topics

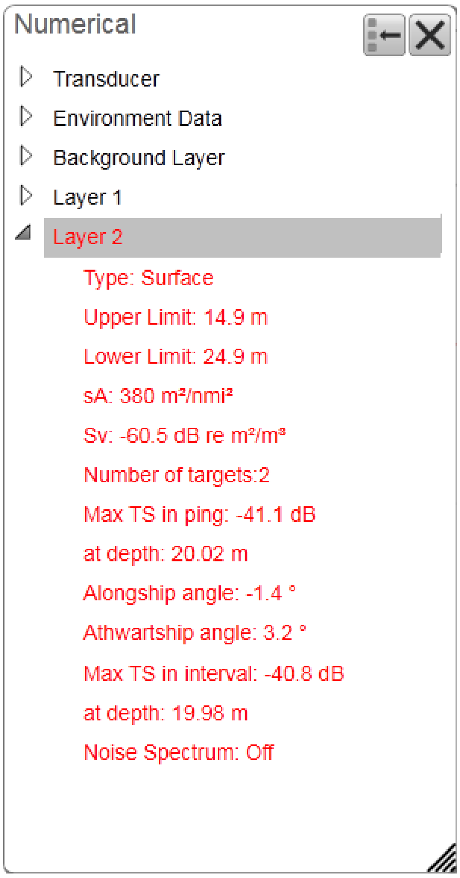
Numerical information pane description, page 478
Information panes, page 462

Layer list

The **Layer** list contains acoustic data related to a specific layer. This layer covers the range you defined in the **New Layer** dialog box. When the layer is "active" the data is shown with red colour.

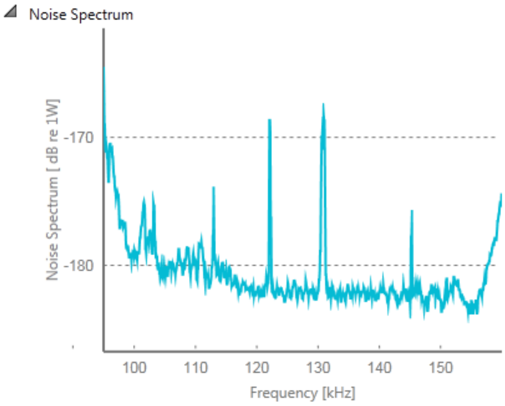
Description

The following information is provided in the **Layer** list. Some of the settings are specific for echo sounder or ADCP operation.



- **Type**: This identifies the echogram type in use.
- **Upper Limit** / **Lower Limit**: These parameters identify the depth range covered by the layer.
- **sA**: $\mathbf{s_A}$ is the *nautical area scattering coefficient*. $\mathbf{s_A}$ is commonly abbreviated as *NASC*. In this context the $\mathbf{s_A}$ value presents the current biomass index.
- **Sv**: $\mathbf{S_v}$ is the *volume backscattering strength*. $\mathbf{S_v}$ is commonly abbreviated as *VBS*. The $\mathbf{S_v}$ value identifies the total volume backscatter in the depth layer.
- **Number of targets**: This information identifies the number of individual targets (single fish) in the depth layer.
- **Max TS in ping ... at depth**: These parameters identify the strongest target strength detected, and at which depth.
- **Alongship angle** / **Athwartship angle**: These parameters identify the alongship and athwartship offset angles for the transducer. These offset angles are taken from the calibration results.
- **Max TS in interval ... at depth**: These parameters identify the strongest target strength detected, and at which depth.
- **Noise Spectrum**: This information is only valid for FM transmissions. The value reflects an estimation of the noise level over the transducer bandwidth. This information is useful for identifying noise sources in both *Passive* and *Active* transmission modes.

When the **Noise Spectrum** option has been activated for the depth layer, a dedicated plot is shown at the bottom of the numerical data list. This option is by default "off".



The **Noise Spectrum** option displays the current background noise in the echogram view. The noise echoes are not TVG compensated, so they will appear with "true" values on all depths.

Tip

To create a new layer, use the **New Layer** *dialog box. The* **New Layer** *dialog box is located on the* **Active** *menu.*

Once you create your own layer, all calculated values from this layer are displayed in the Numerical information pane. When the layer is selected ("activated") in the Numerical information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer. By default, any layer you create will be applied to all echogram views simultaneously.

Once a depth layer has been made you can change its properties using the **Layer Properties** *dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view. The* **Layer Properties** *dialog box is located on the* **Active** *menu.*

To delete a layer, select it in the echogram or in the Numerical information pane (layer data shown with red text), and then click **Delete Layer**. *The* **Delete Layer** *function is located on the* **Active** *menu.*

Related topics

Numerical information pane description, page 478
Information panes, page 462

Zoom information pane description

The *Zoom* information pane allows you to magnify a chosen area of the current echogram.

How to open

To open the *Zoom* information pane, click in the chosen view to activate it, then select the **Zoom** button on the top bar. To open the second and third *Zoom* information panes, simply select the **Zoom** button repeatedly. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description

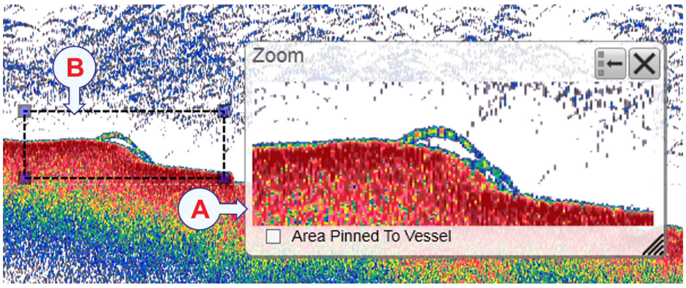
Once the *Zoom* information pane is opened, the zoomed area is shown as a dotted rectangle in the view. You can change the size of the zoomed area, and you can move the rectangle anywhere inside the active view.

- Click inside the rectangle, hold the mouse button depressed, and move the rectangle within the borders of the view.
- Click any of the four corners, hold the mouse button depressed, and drag the rectangle to any other size and shape.

The echoes inside the zoomed area will always be shown in the *Zoom* information pane.

Use **Area Fixed To Vessel** to control the behaviour of the zoom function.

Each *Zoom* information pane export information. When opening the *Biomass* and/or the *Size Distribution* information panes, you will automatically receive information from each of the *Zoom* information panes that you have opened.



A *Zoom information pane*

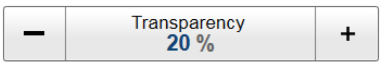
B *Zoom rectangle used to define the size of the zoomed area*

In this screen capture, the zoomed area rectangle is positioned close to the *Zoom* information pane. You can however place the pane and the zoomed area independently anywhere you like inside the active view.

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



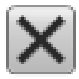
Details

Area Fixed to Vessel

Use **Area Fixed To Vessel** to control the behaviour of the zoom function. When the rectangular zoomed area is established, it can either follow the echogram while it moves towards the left, or it can stay put.

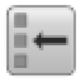
- When **Area Fixed To Vessel** is active, the zoomed area will be permanently positioned on the echogram. The echoes shift through the area, and therefore also shift through the *Zoom* information pane.
- When **Area Fixed To Vessel** is switched off, the zoomed area will "follow" the echogram data from right towards left.

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size



You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

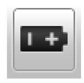
Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Using the Zoom information pane to study details in the echogram, page 186
Transparency function, page 588

Transceiver Power Supply information pane description

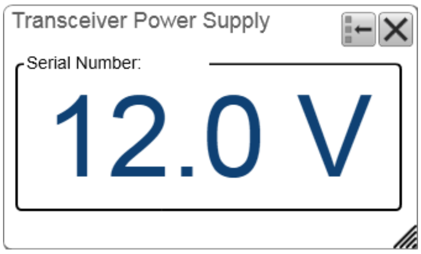
The transceiver may be powered by an external power source. If the transceiver runs of a battery, you must monitor the supply voltage. The *Transceiver Power Supply* information pane shows you the current supply voltage provided to the transceiver.

How to open



To open the *Transceiver Power Supply* information pane, click in the chosen view to activate it, then select the **Transceiver Power Supply** button on the top bar. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



If you operate your EK80 from a battery, it is very useful to keep an eye on the supply voltage. The EK80 software measures this supply voltage in the transceiver, and the result is automatically returned to the *Transceiver Power Supply* information pane.

- As long as the supply voltage is kept between 11.5 and 15 Vdc, the transceiver will work normally.
- If the supply voltage drops to any value between 10 and 11.5 Vdc the transceiver will still work, but the EK80 will give you a message to say that the supply voltage is low.
- If the supply voltage drops to below 10 Vdc, the transceiver will stop. The EK80 will then notify you with another message.

One information pane shows you the supply voltage for all the transceivers in use on your EK80 system. The information pane shows the supply voltage for all transceivers that broadcast this information on the communication link to the Processor Unit. This includes the Wide Band Transceiver (WBT) and the General Purpose Transceiver (GPT). The WBT Mini and WBT Tube transceivers are also supported.

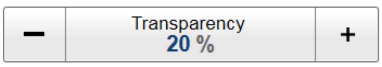
Tip

This information is also found in the **BITE** *(Built-In Test Equipment) dialog box.*

Before you open an information pane, you must first click in an echogram view to make it "active". By doing this you select the channel. In most cases, the data in the information pane is only valid for the selected channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

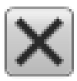
You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



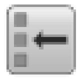
Details

Close



Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.

Reset size



You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

Related topics

Information panes, page 462
Increasing the visibility of the information panes, page 246
Monitoring the supply voltage, page 343
Transparency function, page 588

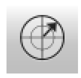
ADCP information pane description

The *ADCP* information pane displays velocities in horizontal and vertical direction. The horizontal velocity information is displayed in a compass.

Prerequisites

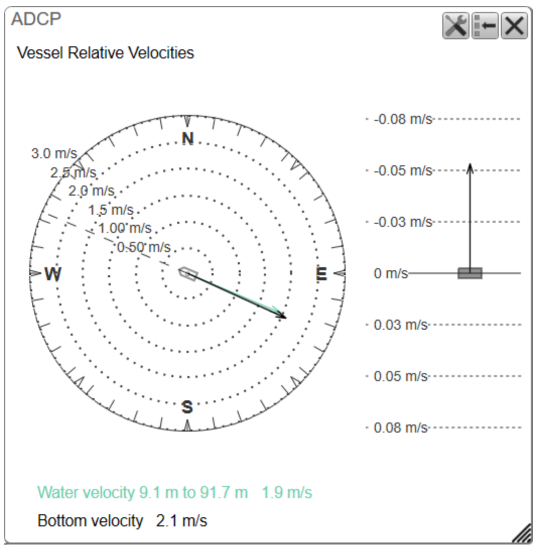
This information pane is available only when ADCP is activated.

How to open



Select the **ADCP Views** button on the top bar to open the *ADCP* information pane. To *close* the information pane, select the button on the top bar one more time. You can also select **Close** in the top right corner of the pane.

Description



The ADCP information pane presents horizontal and vertical current velocities. The horizontal velocities are displayed by default in the left side of pane in a compass rose. The vertical velocity is displayed in the right side of the pane in a vertical diagram. The vertical velocity presentation can switched on/off in the *ADCP* page in the **Information Pane Options** dialog box.The numerical values of the horizontal velocities are displayed across the bottom.

The current velocity is commonly displayed as an arrow. The length of the arrow represents the magnitude of the velocity while the tip of the arrow indicates the direction.

The current velocity can be broken down into components in three dimensions. Displaying the horizontal and vertical component of the current velocity provides a visualisation of the displacement of the current in these directions.

Select **Information Pane Options** to change the settings in this information pane. To open the **Information Pane Options** dialog box, select the button on the **Active** menu. You can also select the **Setup** button in the ADCP information pane. Velocity is measured in m/s or knots. Velocity units is selected in the *Units* page in the **Installation** dialog box.

Horizontal velocity

Horizontal velocities are displayed in a compass rose. The vessel is displayed in the centre of the compass rose. Speed ranges are indicated using dotted circles around the vessel. The compass rose shows two different velocities.

- **Water velocity**

  Water velocity represents the water velocity estimated in the active layer. **Water velocity** is represented in magnitude and direction by a coloured vector arrow. By default its an average value ranging from the blanking zone down to the seabed. The averaging follows the average number set in the menu.The range of the active layer and the magnitude of the velocity is displayed in coloured text at the bottom of the information pane.

  Tip

  Create a new layer (or use an existing layer) if you wish to display the water velocity in a specific depth range in the water column To create a new layer, use the **New Layer** *dialog box. Click between the two layer indicator lines in the view to activate a layer.*

- **Bottom velocity**

  Bottom velocity represents the velocity with which the vessel is moving relative to the sea bottom. **Bottom velocity** is represented in magnitude and direction by a solid, black vector arrow.

The horizontal velocity vectors displayed in the compass are represented as arrows. These velocity arrows are defined by a set of parameters in the **ADCP** page in the *Information Pane Options*.

- **Orientation**

  The vessel orientation will display the vessel fore in the upward direction or north in the upward direction.This setting will affect the direction of the velocity arrows.

- **Compass**

  The compass orientation will display either cardinal directions or vessel relative directions. This setting will affect the direction of the velocity arrows.

- **Bow Marker**

  The bow marker is shown as a dotted line drawn from the bow of the vessel symbol. The line reflects your vessel’s current heading.

- **Velocity vector**

  Velocity vectors display one of two possible water velocities, *velocities relative to the vessel* or *velocities relative to earth coordinates*.

  Velocity relative to the vessel includes vessel velocity and water current velocity. It is called **Vessel Relative Velocities**.

  Velocity relative to earth coordinates only includes water current velocity. It is called **Geographical Velocities**.

  The name of the currently displayed velocities is displayed in the top left corner of the pane.

  Note

  The **Velocity vector** *setting affects both the horizontal and the vertical velocities.*

- **Maximum Speed**

  The **Maximum Speed** setting defines the maximum speed range in the display. You can either select a value for this setting in the list, or you can select **Auto** to let the ADCP functionality select a value.This parameter will affect the magnitude of the displayed velocity arrows.

Vertical velocity

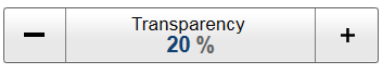
Vertical velocity is displayed as an arrow in a diagram with vertical speed intervals marked. **Vertical velocity** displays the current velocity in the upward/downward direction. The velocity arrow is defined by a set of parameters in the **ADCP** page in the *Information Pane Options*.

- **Maximum Speed**

  The **Maximum Speed** setting defines the maximum speed range in the display. You can either select a value for this setting in the list, or you can select **Auto** to let the ADCP functionality select a value.This parameter will affect the magnitude of the displayed velocity arrows.

You can easily change the physical size and shape of each information pane. Click in its lower right corner, and drag to a new size. To reset the information pane to its default size, select the **Reset size** button in its top right corner.

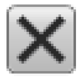
The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.



Details

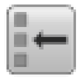
Close

Select this button to close the information pane. The pane closes immediately. If you wish to reopen it, simply click the button on the top bar one more time.



Reset size

You may have manually changed the physical size of the information pane. To reset the information pane to its default size, select the **Reset size** button in its top right corner.



Setup

Select **Setup** to open the **Information Pane Options** dialog box. This dialog box allows you to change the presentation parameters related to the information pane.

Related topics

Information panes, page 462
Exploring water velocities using ADCP, page 197
Acoustic Doppler current profiler, page 779

Echogram views

Topics

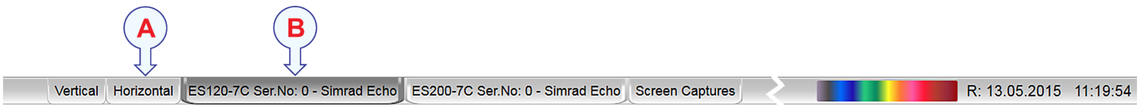
About the echogram views

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open.

Selecting echogram views on the bottom bar

The number of tabs available on the bottom bar depends on how many channels your EK80 has. Two tab "groups" allow you to select channels and views. This example shows the EK80 with two channels. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.



A **Presentation modes**

Three presentation modes are available when you wish to see all the echogram channels simultaneously in the EK80 presentation. The three tabs will arrange the echogram views vertically, horizontally, or in rectangular rows and columns.

By default, the views are arranged automatically in the EK80 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

B **Selecting individual echogram channels**

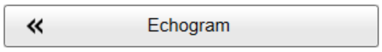
Each channel is shown with a dedicated tab. The channel is identified with the name of the transducer in use. This name is the custom name you provided when you installed the transducer. Select a specific transducer tab to see only that channel in the EK80 presentation.

Supported echogram types

- *Surface*: A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.
- *Bottom*: A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.
- *Pelagic*: A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.
- *Trawl*: The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

Selecting which echogram type to use

Once one or more echogram views are open, you can choose which echogram type to see.



Click once in the relevant view. The view is activated. Open the **Active** menu, click **Echogram** to open the dialog box, and select **Echogram Type** on the **Echogram** page.

In each echogram view, you can also select from a number of markers, lines and annotations to enhance the echogram, or to provide additional information. These can be selected on the **Lines** page in the **Echogram** dialog box.

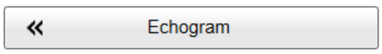
Related topics

Echogram views, page 494
Setting up the echogram presentation, page 151

Surface echogram description

A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom. Since this echogram is referenced to the sea surface, the sea bottom contour will vary with the actual depth. You can select the start range (the depth from which the echogram starts) and the vertical range (the vertical "length" of the echogram) by means of the **Start Range** and **Range** settings. Both the **Range** and the **Start Range** functions are located on the **Main** menu.

How to open



To activate *Surface* echogram, click in the chosen view to make it "active". Select **Echogram** on the **Active** menu. Select the **Echogram** tab to open the page. On the **Echogram** page, set **Echogram type** to *Surface*.

Description

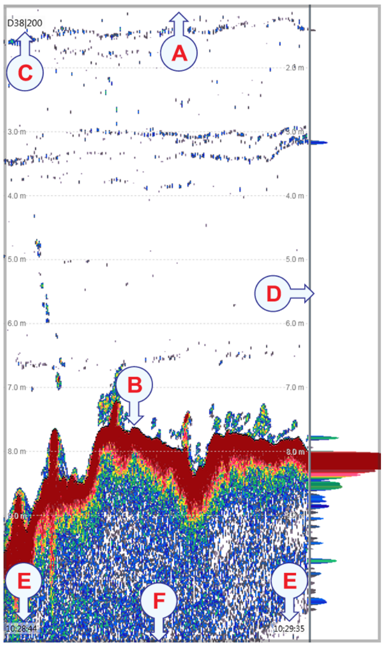
The *Surface* echogram is often used to study the water column from a few meters under the hull and down to the bottom. If you set up the **Start Range** and **Range** depths to place the sea bottom contour at the lower end of the echogram, you will have good opportunity to study the echoes from the water column. Since this echogram is referenced to the sea surface, the sea bottom contour will vary with the actual depth.

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog box; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **Start Range** and **Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

Tip

For closer investigation, use the Zoom information pane to enlarge echoes from the water column or the bottom.



A **This is the start depth of the echogram**

In a *Surface* echogram you may wish to start the echogram from the surface, and will then set the **Start Range** to *0 (zero)*. You will then see the transmit pulse as a strong echo at the top of the echogram. Try setting **Start Range** to a small value, for example *1 meter*. The echogram will then start immediately *under* the keel or transducer face.

B **This is the bottom (seabed)**

The bottom is shown with a strong contour. Since the echogram is referenced to the sea surface, the bottom will vary with the actual depth. Different bottom conditions will have a visual effect on how the bottom echo is drawn. A hard bottom (rock) will give you a stronger echo - and thus a darker colour - than a soft bottom (mud or silt).

The **Echogram** page in the **Echogram** dialog box allows you to make adjustments to the bottom contour. You can add a black bottom line, and a white line to make the bottom "stand out".

C **Transducer identification**

This text identifies the transducer - and thus also the channel - used to create the echogram. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D **This is the scope view**

The *Scope* view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E **These are the labels**

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

The labels can be changed on the **Horizontal Axis** page in the **Echogram** dialog box.

F **This is the lower end of the chosen depth range**

This depth is normally a few meters below the bottom contour, depending on the chosen range. The total echogram range (A) to (F) is defined with the **Range** button on the **Main** menu.

Example

Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 10 meters. This will make the echogram start from 10 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from 10 meters below the sea surface, and down to 10 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

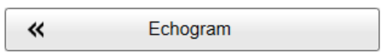
Related topics

Echogram views, page 494
Setting up the echogram presentation, page 151

Bottom echogram description

The *Bottom* echogram shows the echoes over and below the sea bottom contour. Since this echogram is referenced to the sea bottom, the sea surface will vary with the actual depth, while the bottom is drawn flat. You can select the start range (the depth from which the echogram starts) and the vertical range (the vertical "length" of the echogram) by means of the **Start Range** and **Range** settings. Both the **Range** and the **Start Range** functions are located on the **Main** menu.

How to open



To activate *Bottom* echogram, click in the chosen view to make it "active". Select **Echogram** on the **Active** menu. Select the **Echogram** tab to open the page. On the **Echogram** page, set **Echogram type** to *Bottom*.

Description

A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom. Set up the **Start Range** and **Range** depths to hide the surface and place the sea bottom contour at the middle of the echogram. You can investigate the sea bottom conditions and hardness, and detect fish.

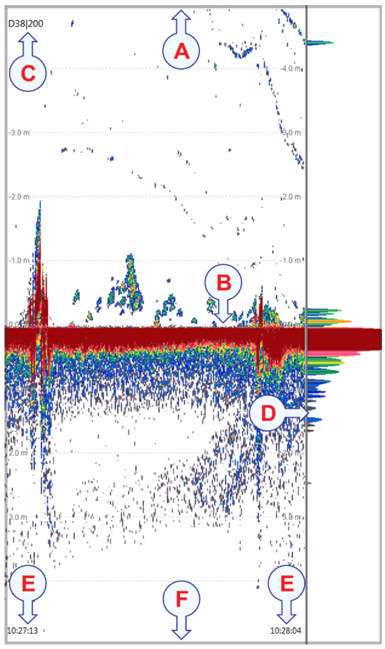
Note

The echogram is only drawn for pings that have a successful bottom detection.

Since the *Bottom* echogram is referenced to the bottom, the **Start Range** value must be negative. If you wish to start your echogram from 10 meters above the bottom, you must set the **Start Range** to *–10 m*. The **Range** setting defines the vertical range from the start depth and down.

Tip

For closer investigation, use the Zoom information pane to enlarge the bottom echoes.



A **This is the start depth of the echogram**

In a *Bottom* echogram you will probably wish to start the echogram from a fixed distance above the bottom. To do this, you must set the **Start Range** to a negative value, for example *-10 m*. This negative value defines how many meters above the bottom the echogram will start.

The **Range** value defines the vertical "height" of the echogram. To make sense, the value must be positive, and numerically larger than the chosen **Start Range**. If you have chosen to start your echogram from *-10 m*, the range must be larger than 10 meters, for example 20 meters.

B **This is the bottom (seabed)**

The bottom is shown with a strong contour. Since the echogram is referenced to the sea surface, the bottom will vary with the actual depth.

Different bottom conditions will have a visual effect on how the bottom echo is drawn. A hard bottom (rock) will give you a stronger echo - and thus a darker colour - than a soft bottom (mud or silt).

The **Echogram** page in the **Echogram** dialog box allows you to make adjustments to the bottom contour. You can add a black bottom line, and a white line to make the bottom "stand out".

C Transducer identification

This text identifies the transducer - and thus also the channel - used to create the echogram. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D This is the scope view

The *Scope* view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E These are the labels

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

The labels can be changed on the **Horizontal Axis** page in the **Echogram** dialog box.

F This is the lower end of the chosen depth range

This depth is normally a few meters below the bottom contour, depending on the chosen range. The total echogram range (A) to (F) is defined with the **Range** button on the **Main** menu.

Example

Start Range and **Range** in bottom-related echogram

In a bottom echogram, set the **Start Range** value to –5 metres. This will make the echogram start from 5 metres above the sea bottom. Set **Range** to the 5 metres plus 10 = 15 metres. The echogram will now show the area from 5 metres above the depth, and down to 10 meters "below" the sea bottom. The sea bottom contour will appear as a flat line.

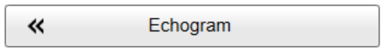
Related topics

Echogram views, page 494
Setting up the echogram presentation, page 151

Pelagic echogram description

The *Pelagic* echogram shows you a selected part of the water column. The echoes start from any start depth below the sea surface, which is used as depth reference. The bottom contour shall not be visible in the echogram. You can select the start range (the depth from which the echogram starts) and the vertical range (the vertical "length" of the echogram) by means of the **Start Range** and **Range** settings. Both the **Range** and the **Start Range** functions are located on the **Main** menu.

How to open



To activate *Pelagic* echogram, click in the chosen view to make it "active". Select **Echogram** on the **Active** menu. Select the **Echogram** tab to open the page. On the **Echogram** page, set **Echogram type** to *Pelagic*.

Description

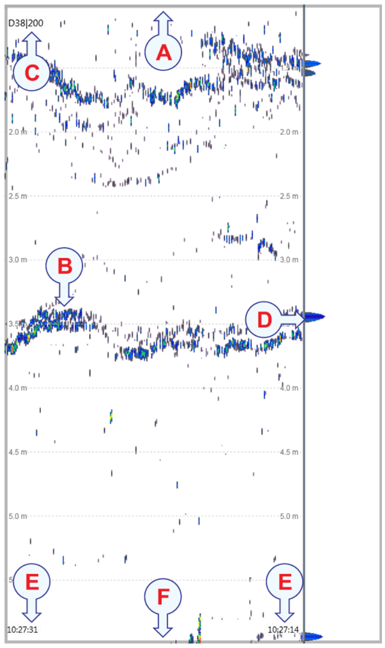
A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour. To do this you must set up the **Start Range** to the preferred upper depth. The **Range** depth must then be chosen to make the echogram stop somewhere *over* the bottom contour. This gives you good opportunity to study the echoes from the water column.

Pelagic echograms are useful when you work in deeper waters. The reduced range and the fact that you do not need to wait for the bottom echo means that the EK80's ping rate is increased. The software algorithms in the EK80 are designed to work without the bottom detection reference.

In a *Pelagic* echogram the calculations disregard any bottom detection. All calculations are based on the entire echogram shown in the view. If the bottom echo is present in the echogram, the biomass calculation will be wrong.

Tip

For closer investigation, use the Zoom information pane to enlarge echoes from the water column.



A **This is the start depth of the echogram**

In a *Pelagic* echogram you may wish to start the echogram from a certain distance below the surface, and will then set the **Start Range** to a relatively large numerical value.

B **Echoes**

These are echoes from fish or other objects in the water column.

C **Transducer identification**

This text identifies the transducer - and thus also the channel - used to create the echogram. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D **This is the scope view**

The *Scope* view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E **These are the labels**

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

The labels can be changed on the **Horizontal Axis** page in the **Echogram** dialog box.

F **This is the lower end of the chosen depth range**

The **Range** value defines the vertical "height" of the echogram. In order to hide the bottom contour, this numerical value must be chosen with care. Subtract the start range value from the actual depth. This gives you the maximum range value.

Example

<u>**Start Range** in a pelagic echogram</u>

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

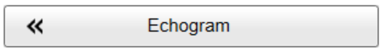
Related topics

Echogram views, page 494
Setting up the echogram presentation, page 151

Trawl echogram description

The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope. In addition to the trawl opening, the echogram covers a certain range over and under the trawl opening. You can select the start range (the depth from which the echogram starts) and the vertical range (the vertical "length" of the echogram) by means of the **Start Range** and **Range** settings. Both the **Range** and the **Start Range** functions are located on the **Main** menu.

How to open



To activate *Trawl* echogram, click in the chosen view to make it "active". Select **Echogram** on the **Active** menu. Select the **Echogram** tab to open the page. On the **Echogram** page, set **Echogram type** to *Trawl*.

Description

Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram. If another trawl or catch monitoring system is used, and this system does not provide the trawl opening and/or trawl distance automatically, the values must be entered manually.

This information is required for the trawl echogram to be generated. Without the depth of the headrope, the echogram would appear like a standard pelagic echogram controlled by the **Range** and **Start Range** settings.

Note

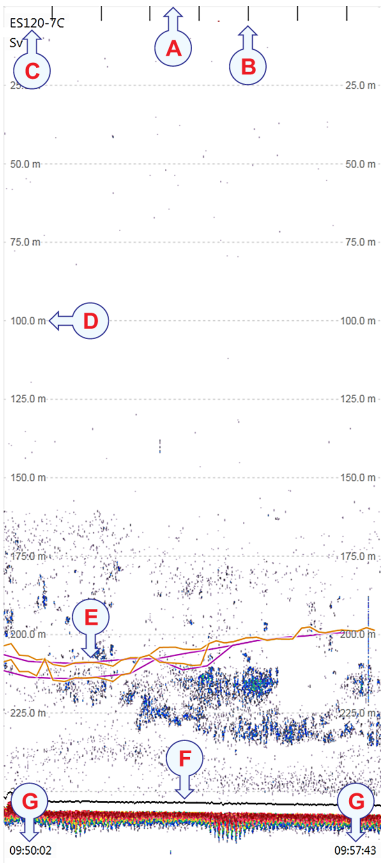
The Trawl echogram is only drawn when trawl position information is available.

The distance from the headrope to the footrope (trawl opening) can be manually set on the **Trawl** page. This is useful for trawl sensor systems that do not measure the trawl opening, or when the measured distance is unreliable. You can also provide the distance from the vessel to the trawl opening. The depth of the headrope must however be imported from the catch monitoring system. The **Trawl** page is located in the **Installation** dialog box.

The biomass calculations in a *Trawl* echogram are not restricted by the bottom detection. This means that the bottom echo will be included in the calculations if it appears within the chosen range.

Tip

For closer investigation, use the Zoom information pane to enlarge echoes from the water column.



A **This is the start depth of the echogram**

In a *Trawl* echogram you may wish to start the echogram from a certain distance below the surface, and will then set the **Start Range** to a relatively large numerical value. In this example, the start depth is 0 meters.

B **Vertical Ticks**

These lines are used to measure time or distance. You can switch these vertical ticks on or off on the **Lines** page in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

C **Transducer identification**

This text identifies the transducer - and thus also the channel - used to create the echogram. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

D **Scale Lines**

When enabled, equidistant horizontal scale lines are drawn inside the view in the current foreground colour; black during day and white during night. You can switch the scale lines on or off on the **Lines** page in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

E **Trawl lines**

Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram. You can switch the trawl lines on or off on the **Lines** page in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

F **This is the bottom (seabed)**

The bottom is shown with a strong contour. Since the echogram is referenced to the sea surface, the bottom will vary with the actual depth. Different bottom conditions will have a visual effect on how the bottom echo is drawn. A hard bottom (rock) will give you a stronger echo - and thus a darker colour - than a soft bottom (mud or silt).

The **Echogram** page in the **Echogram** dialog box allows you to make adjustments to the bottom contour. You can add a black bottom line, and a white line to make the bottom "stand out".

G **These are the labels**

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

The labels can be changed on the **Horizontal Axis** page in the **Echogram** dialog box.

Related topics

Echogram views, page 494
Setting up the echogram presentation, page 151

Velocity measurement views

Topics

About the velocity measurement views

The EK80 supports several different ADCP data. Each type of ADCP data is shown in a separate view in the EK80 presentation. Echo sounder information and ADCP information re presented in separate presentations and cannot be mixed.

Selecting presentation mode on the bottom bar

The bottom bar displays tabs for the available views in theEK80. The EC150 transducer can be used in both normal echo sounder mode and in ADCP mode. There are two tabs for the EC 150, one for echo sounder mode (ES) and one for ADCP mode (ADCP)

By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.

By default, the views are arranged automatically in the EK80 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

Available ADCP information types

- *Vessel Velocity*

  The *Vessel Velocity* views display water velocities relative to the vessel. The views display water velocity in fore/aft and port/starboard direction as well as down towards the seafloor. Vessel speed is displayed separately.

- *Geo Velocity*

The *Geo Velocity* views display water velocity relative to earth coordinates, i.e. water current velocity. The water current velocity is displayed in the cardinal directions (north-south, east-west), as well as velocity down towards the bottom. Water current speed is displayed in a separate view.

- *Beam Velocity*

  The *Beam Velocity* presentation displays the water velocity along the beam direction. The water is either moving towards of away from the ADCP transducer at the same angle as the vertical orientation of the beam (30 degrees). The *Beam Velocity* presentation includes one view for each beam.

- *Backscatter*

  Backscatter views display echo intensity in echograms, one for each of the ADCP beams. Backscatter data are output in decibel (dB).

- *Correlation*

  The *Correlation* views display a measure of the similarity between the received echoes. Correlation is a measure of data quality.

- *Error Velocity*

  Error velocity is the difference between two estimates of the vertical velocity. It is an important means to evaluate the data quality. Error velocity will show the magnitude of the errors, not the source.

- *Percent Good*

  The *Percent Good* view displays the percentage of pings which has passed a set of defined quality criteria. The rejection criteria include low correlation and large error velocity. The default threshold is defined in the **ADCP Editing** dialog box.

Selecting which ADCP views to use

Use the **ADCP View Settings** dialog box to select the ADCP views you want to see. The **View Selection** page allows you to choose which views to present, and how to organize them. The **ADCP View Settings** dialog box is located on the **Active** menu.

Setting lines and markers in ADCP views

The **Lines** page in the **ADCP View Settings** dialog box controls the horizontal and vertical lines used in the ADCP views. The **ADCP View Settings** dialog box is located on the **Active** menu.

Working with depth layers in ADCP views

Exploring velocities in different layers of the water column is done using depth layers. Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

Related topics

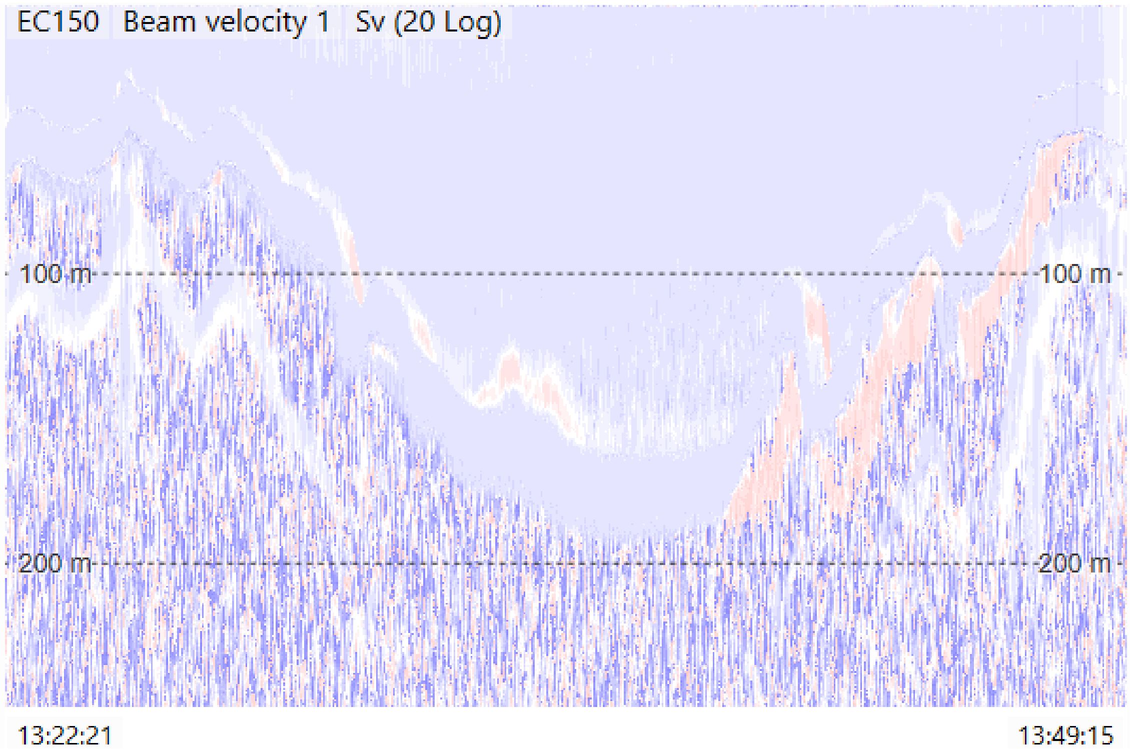
Setting up the ADCP presentation, page 212

Beam Velocity views

The *Beam Velocity* presentation displays the water velocity along the beam direction. The water is either moving towards of away from the ADCP transducer at the same angle as the vertical orientation of the beam (30 degrees). The *Beam Velocity* presentation includes one view for each beam. By default the ADCP views cover the entire screen and display information horizontally.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

These views display water velocity along the direction of each of the beams. The travelling time of sound waves gives an estimate of the distance. The frequency shift of the echo is proportional to the water velocity along the acoustic path. The beams are used to create a profile of water velocities in the beam direction. From these beam velocities all other water velocities (vessel velocity and geo velocity) are calculated.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box. There are several available views, one for each direction of the ADCP beams.

The beams in ADCP has an nautical orientation which is related to the numbering of the ADCP views.

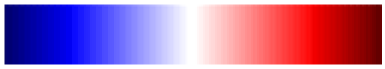
1 **Fore Starboard**

2 **Aft Port**

3 **Aft starboard**

4 **Fore Port**

Details



The colour scale for ADCP velocity is a bipolar scale of two colours. It visualises the direction and magnitude of the velocity. Blue colour indicates negative values for velocity. Red colour indicates positive values for velocity. Higher velocities are displayed using a deeper colour.The intensity of the colours indicates the magnitude of the velocity.

To interpret the *Beam Velocity* views right it is important to know what direction the colours represents and to know the direction of each beam.

- Red colour indicates water velocity down towards the seafloor.
- Blue colour indicates water velocity up towards the surface.
- Beam 1 and 4 are both pointing in the forward direction. Water velocity in the aft direction will move towards the surface in these two beams and therefore be coloured blue.
- Beam 2 and 3 are pointing in the aft direction. Water velocity in the aft direction will move away from the surface in these two beams and therefore be coloured red.

The same principle applies to water velocities moving in the starboard-port direction and the direction of the beams being in the starboard/port direction.

ADCP Colour Span is used to set the maximum velocity values (positive and negative). **ADCP Colour Span** is located on the **Active** menu. If the velocities displayed is in the range -0.5 m/s to 0.5 m/s, **ADCP Colour Span** should have the value 0.5 m/s in order to visualise the velocity with the best colour resolution.The maximum value should be set in relationship to the velocities displayed.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

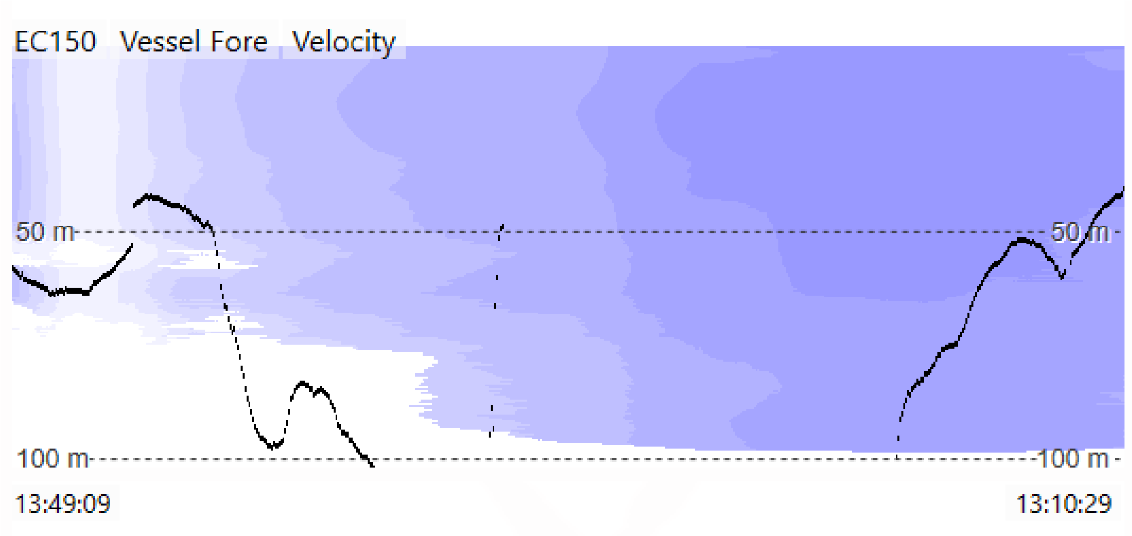
Setting up the ADCP presentation, page 212
Units page, page 699

Vessel Velocity views

The *Vessel Velocity* views display water velocities relative to the vessel. The views display water velocity in fore/aft and port/starboard direction as well as down towards the seafloor. Vessel speed is displayed separately. By default the ADCP views cover the entire screen and display information horizontally.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

Vessel velocities are estimated from the measured beam velocities. These water velocities includes both the velocity of the vessel itself and the velocity of the water current.

- *Vessel Fore Velocity* view displays current velocity added to vessel velocity in the fore/aft direction of the vessel.
  - Blue colour indicates water velocity towards the aft direction.
  - Red colour indicates water velocity in the fore direction.
- *Vessel Starboard Velocity* view displays current velocity added to vessel velocity in the starboard/port direction of the vessel.
  - Blue colour indicates water velocity towards the port direction.
  - Red colour indicates water velocity in the starboard direction.
- *Vessel Down Velocity* view displays the current velocity added to the vessels movements in the downward direction towards the bottom.
  - Red colour indicates water velocity down towards the seafloor.
  - Blue colour indicates water velocity up towards the surface.

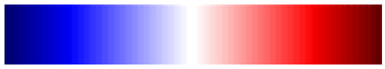
- The *Vessel Speed* view displays the speed of the vessel with no direction indicated. Vessel speed is superimposed on the current speed
  – High speed is displayed using deeper reds and lower speed is displayed using lighter reds.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box. Vessel velocity and speed are both measured in m/s or knots.

Details



The colour scale for ADCP velocity is a bipolar scale of two colours. It visualises the direction and magnitude of the velocity. Blue colour indicates negative values for velocity. Red colour indicates positive values for velocity.Higher velocities are displayed using a deeper colour. The colour displays direction of the velocity.

ADCP Colour Span is used to set the maximum velocity values (positive and negative). **ADCP Colour Span** is located on the **Active** menu.If the velocities displayed is in the range -0.5 m/s to 0.5 m/s, **ADCP Colour Span** should have the value 0.5 m/s in order to visualise the velocity with the best colour resolution.The maximum value should be set in relationship to the velocities displayed.

example

A vessel moves forward at 3 m/s. The current velocity is 0.5 m/s in the opposite direction of the movement of the vessel. The *Vessel Fore* view will display a velocity of -3.5 m/s. The velocity will be displayed in blue colour.

The colour scale for speed is gradient. High speed is displayed using deeper reds and lower speed is displayed using lighter reds.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

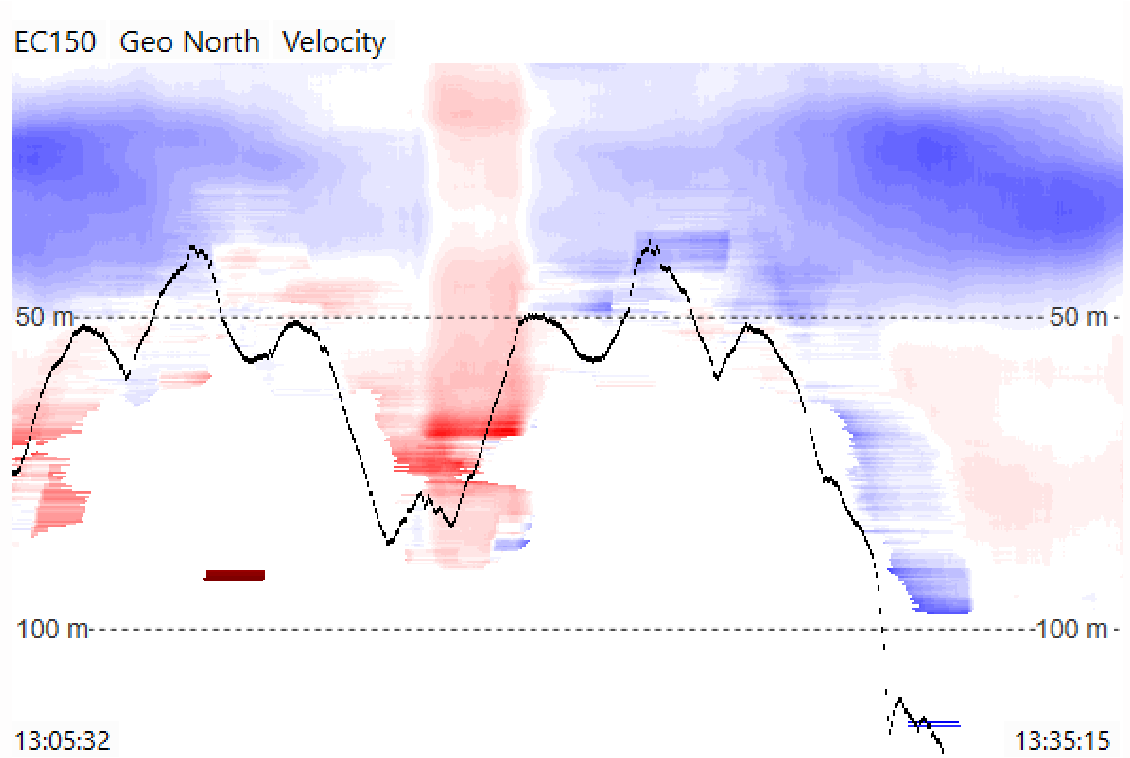
Setting up the ADCP presentation, page 212
Units page, page 699

Geo Velocity views

The *Geo Velocity* views display water velocity relative to earth coordinates, i.e. water current velocity. The water current velocity is displayed in the cardinal directions (north-south, east-west), as well as velocity down towards the bottom. Water current speed is displayed in a separate view. By default the ADCP views cover the entire screen and display information horizontally.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

The *Geo Velocity* views display water velocity relative to earth coordinates, i.e. water current velocity. The geo velocities are estimated from the vessel velocities which again are estimated from the beam velocities. The velocity impact of the movement of the vessel is removed from these data. Velocity is measured in m/s or knots.

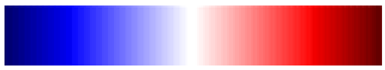
- The *Geo North Velocity* view displays water current velocity in the north/south direction.
  - Blue colour indicates water current velocity in the south direction.
  - Red colour indicates water current velocity in the north direction.

- The *Geo East Velocity* view displays water current velocity in the east/west direction.
  - Blue colour indicates water current velocity in the west direction.
  - Red colour indicates water current velocity in the east direction.
- The *Geo Down Velocity* displays water current velocity in the downward direction towards the seafloor. The estimated velocity is compensated for the heave and pitch of the vessel.
  - Blue colour indicates water velocity up towards the surface.
  - Red colour indicates water velocity down towards the seafloor.
- The *Geo Speed* view displays water speed as an absolute value indicating no direction.

Geo North Velocity displays a velocity of -0.17 m/s. This indicates a current of 0.17 m/s going southwards.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box.

Details



The colour scale for ADCP velocity is a bipolar scale of two colours. It visualises the direction and magnitude of the velocity. Blue colour indicates negative values for velocity. Red colour indicates positive values for velocity.Higher velocities are displayed using a deeper colour. The colour displays direction of the velocity.

ADCP Colour Span is used to set the maximum velocity values (positive and negative). **ADCP Colour Span** is located on the **Active** menu.If the velocities displayed is in the range -0.5 m/s to 0.5 m/s, **ADCP Colour Span** should have the value 0.5 m/s in order to visualise the velocity with the best colour resolution.The maximum value should be set in relationship to the velocities displayed.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

The colour scale for speed is gradient. High speed is displayed using deeper reds and lower speed is displayed using lighter reds.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

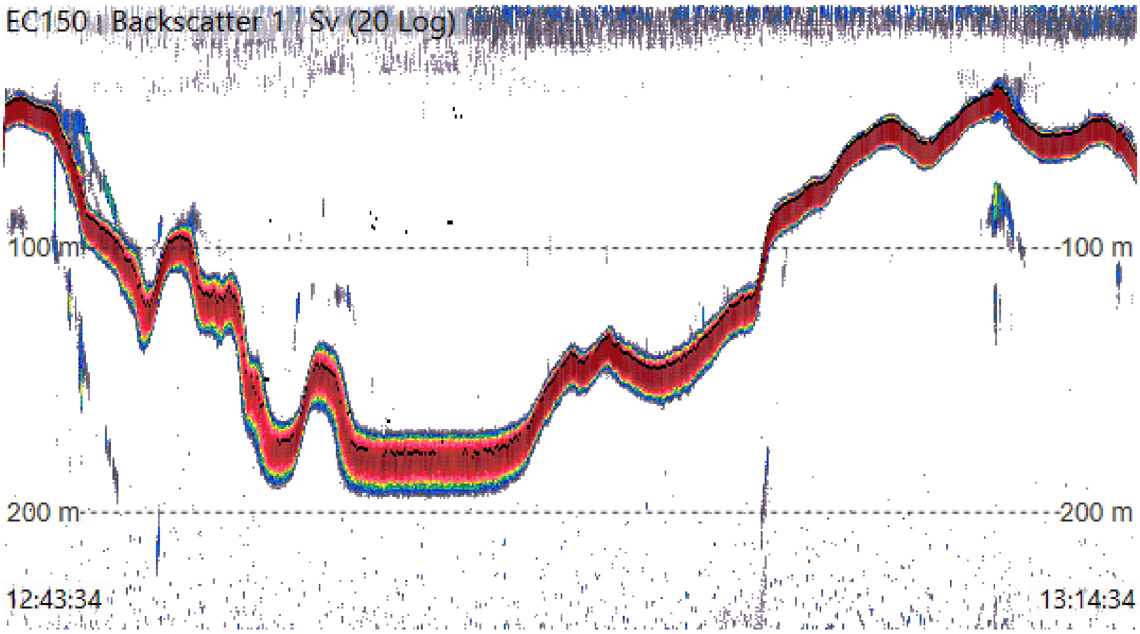
Setting up the ADCP presentation, page 212
Units page, page 699

Backscatter view

Backscatter views display echo intensity in echograms, one for each of the ADCP beams. Backscatter data are output in decibel (dB). By default the ADCP views cover the entire screen and display information horizontally.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

The ADCP is designed to measure currents, but it can also be a useful tool for investigating the distribution and abundance of zooplankton in the water. The intensity of the backscattered soundwaves for each depth cell is a "snapshot" of the echo intensity at a distance of two-thirds the way along the depth cell. This can be used to estimate the integrated mass of the backstterers over the footprint volume (width and thickness) of the original acoustic beams.

The echograms display the water column down to the bottom. The bottom contour will vary with the actual depth. The backscatter signal is adjusted for power loss due to geometrical spreading, viscous damping, scattering and instrument dependent factors. As with velocity, the instrument compensate for the apparent changes in cell depth due to instrument tilt and roll. In this view the colours indicate the backscatter intensity.

These views display a traditional echogram for each of the beams in the ADCP.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box.

The beams in ADCP has an nautical orientation which is related to the numbering of the ADCP views.

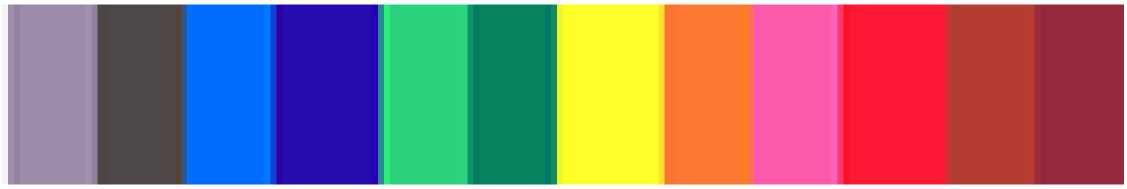
1 **Fore Starboard**

2 **Aft Port**

3 **Aft starboard**

4 **Fore Port**

Details



The colour scale for ADCP **Backscatter** is by default a **Smooth Echo sounder** scale. To change the colour scale, use the **Colour Setup** dialog box.

Tip

Move the cursor across the view to get numerical information of the ADCP data. **Scatter value** *is displayed in the tooltip and represents the echo intensity in dB. By default, the information is related to the exact position of the cursor.*

Related topics

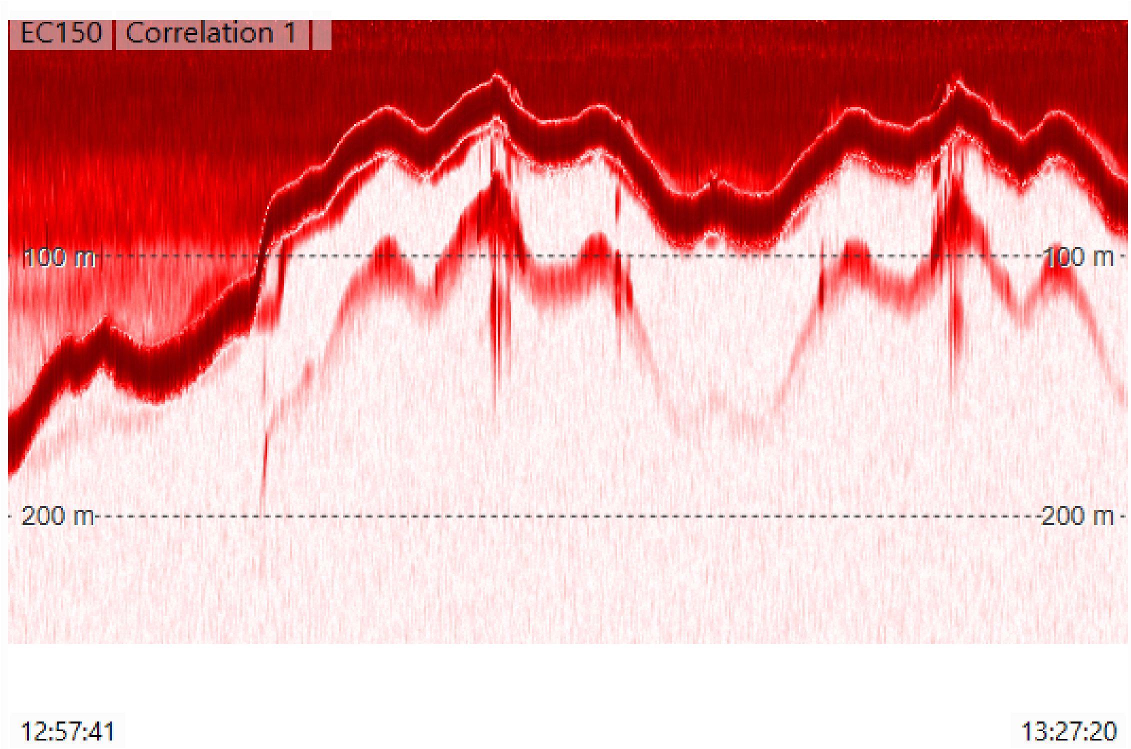
Setting up the ADCP presentation, page 212
Units page, page 699

Correlation views

The *Correlation* views display a measure of the similarity between the received echoes. Correlation is a measure of data quality. The output is scaled in percent.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

The *Correlation* views display a visualisation the dependence or likeness between the transmitted pulse and the received echo.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box. By default the ADCP views cover the entire screen and display information horizontally.

The beams in ADCP has an nautical orientation which is related to the numbering of the ADCP views.

1 **Fore Starboard**

2 **Aft Port**

3 **Aft starboard**

4 **Fore Port**

Correlation is the comparison of the return signal of a pulse to itself as it appears as an echo received. The correlation is perfect (100%) as the return signal is coming from one (and the same) set of scatters in each beam. As time increases, both the original pulse and the echo have moved longer through the water. There are two main reasons to this.

- The whole group of scatters has moved because of the velocity of the currents. This is the Doppler shift and is the desired information for calculating water velocity.

- New scatters have entered the volume of the pulse while others have left it producing uncertainty in the Doppler estimate.

The correlation between the signals is now less than 100%.

Details

The colour scale for ADCP **Backscatter** is by default a **Smooth Echo sounder** scale. To change the colour scale, use the **Colour Setup** dialog box.

Tip

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

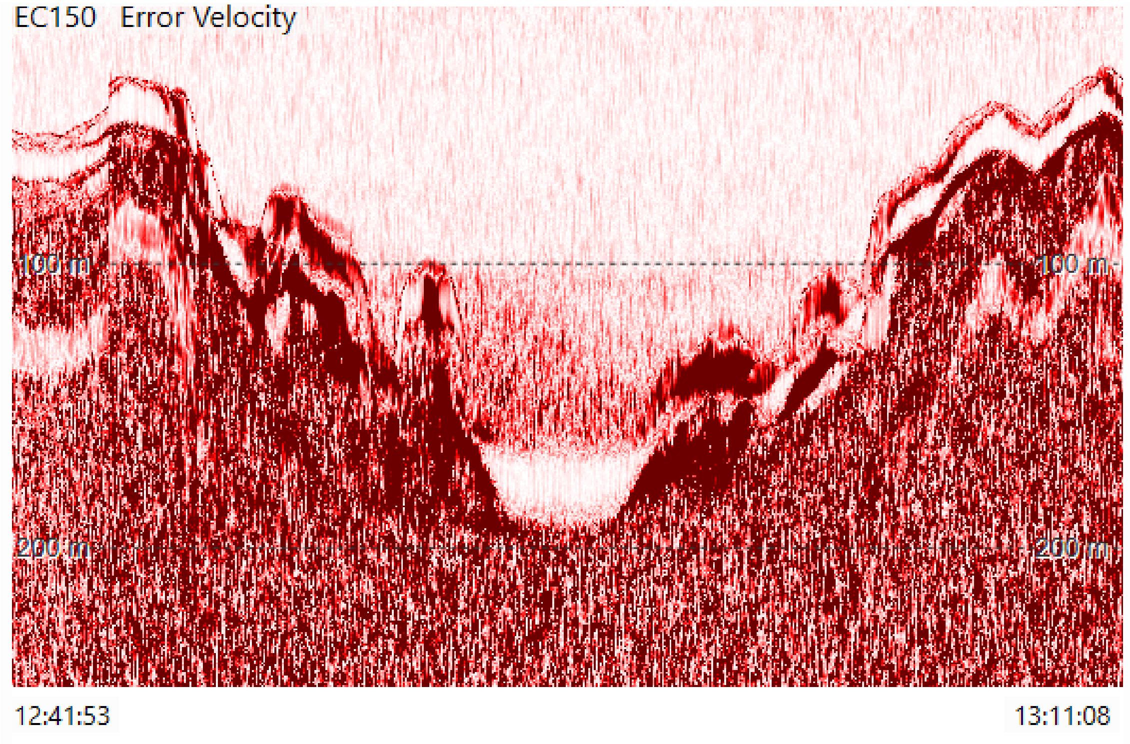
Setting up the ADCP presentation, page 212
Units page, page 699

Error Velocity view

The *Error Velocity* view displays a graphic representation of errors velocities in the drawing range of the water column. Difference in colours close to ascents/descents will indicate higher/lower error velocities in these areas.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

Error velocity is the difference between two estimates of the vertical velocity. Errors occur mainly due to inhomogeneities in the water, or malfunctioning equipment. Error velocity will show the magnitude of the errors, not the source.It is an important means to evaluate the data quality.It is calculated using beam velocity data.

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box. The drawing range of the view, i.e. the vertical axis definition of deepest depth, can be configured. In this illustration, full drawing range is used.

Error Velocity is measured in m/s or knots.

Details

The colour scale for ADCP error velocity is gradient using a single colour. This visualises smaller errors using a lighter red and larger errors using darker red.

ADCP Colour Span is used to set the maximum velocity values. **ADCP Colour Span** is located on the **Active** menu. The maximum value should be set in relationship to the velocities displayed. If the error velocities displayed is in the range -0 to 0.5 m/s, **ADCP Colour Span** should have the value 0.5 m/s in order to visualise the error velocity with the best colour resolution.

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

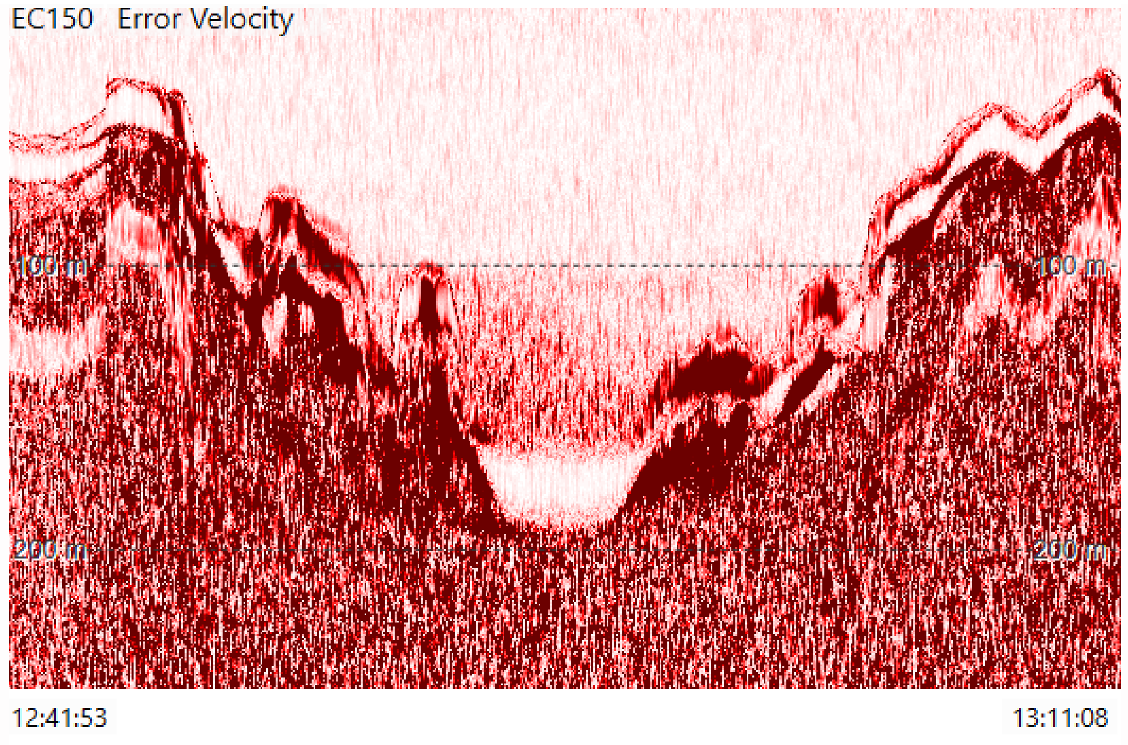
Setting up the ADCP presentation, page 212
Units page, page 699

Percent Good view

The *Percent Good* view displays the percentage of pings which has passed a set of defined quality criteria. The rejection criteria include low correlation and large error velocity. By setting a threshold value for **Percent Good** and enable the echoes to get filtered by these values you remove unwanted results from all your ADCP views.

How to open

Use the **ADCP View Settings** dialog box to open this view. The **ADCP View Settings** dialog box is located on the **Active** menu.



Description

The vertical axis displays depth in meters. You can configure the unit for **Depth** in the **Units** page in the **Installation** dialog box. The horizontal axis is displayed using time stamps. You can configure the units for the horizontal axis in the **Horizontal Axis** page in the **ADCP View Settings** dialog box. **Percent Good** is measured in percent.

In regions where data are good, **Percent Good** will often stay very high (near 100%) for most of the profile, plummeting to a low at the bottom. In regions where bubbles or other acoustic noise cause signal attenuation or blockage, percent good can have a more linear profile with depth. Under these conditions there are often dubious looking tails in the velocity near the bottom for the profiles.

Details

The colour scale for ADCP **Percent Good** is gradient using a single colour. Good data is represented by a deeper red colour, less good data is represented by lighter reds or white.

Move the cursor across the view to get numerical information of the ADCP data. By default, the information is related to the exact position of the cursor.

Related topics

Setting up the ADCP presentation, page 212
Units page, page 699

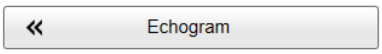
Lines and markers

Annotation markers description

Annotation markers may be added to the echogram to identify special echoes or special events. Annotations can also be added to your ADCP views.

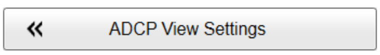
How to open

To activate the annotation markers, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. Select **Lines** to open the page. On the **Lines** page, enable the annotation markers you wish to see.

To activate annotation markers for ADCP, click in the ADCP view to make it "active".



- Open the **Active** menu.
- Select **ADCP View Settings**.
- On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
- On the **Lines** page, enable the annotation markers you wish to see.

Description

When you study an echogram, it is often useful to add personal comments to it. Annotations can also be useful to add to ADCP views. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. Use the **Annotations** page to type comments and insert annotations into views. Annotations can be typed in manually, set up for automatic generation, or imported from an external device. The **Annotations** page is located in the **Installation** dialog box.

When you save raw data, the annotations you have defined are stored as annotation datagrams.

The **Lines** page in the **Echogram** dialog box allows you to enable or disable annotations in the echograms.

The **Lines** page in the **ADCP View Settings** dialog box allows you to enable or disable annotations in the ADCP views.

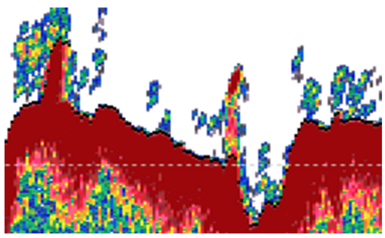
Select **Text** or **Line** to allow annotation markers to be shown. If you select **Line**, each text annotation is followed by a vertical line for improved visibility.

Related topics

Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

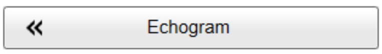
Bottom Line description

A bottom line can be added to your echogram to enhance the visual bottom detection. A bottom line can also be added to your ADCP views.



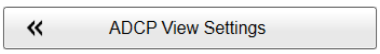
How to open

To activate the bottom line, click in the echogram view to make it "active".



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Select **Bottom Line**.

To activate the ADCP bottom line, click in the ADCP view to make it "active".



- Open the **Active** menu.
- On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
- Select **ADCP View Settings**.
- Select **Bottom Line**.

Description

The bottom line appears as thin line that follows the bottom contour. The line is drawn in the current foreground colour. You can use the white and the bottom lines simultaneously.

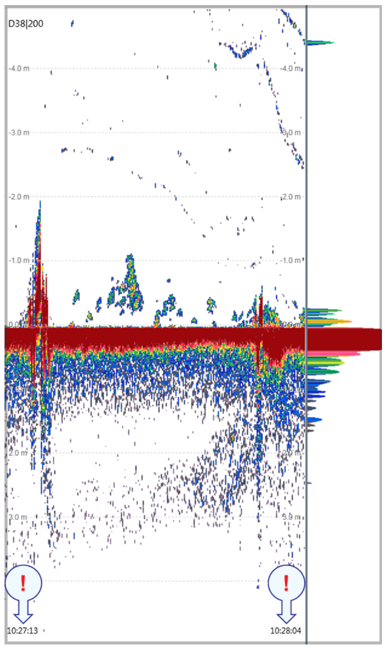
This is a visual enhancement. It does not have any effect on the EK80 performance.

Related topics

Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

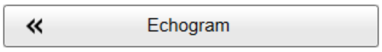
Labels description

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view. The labels are available for echograms and ADCP views.



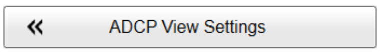
How to open

To activate the labels, click in the echogram view to make it "active".



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Horizontal Axis** to open the page. Enable the label you wish to see.

To active the labels in ADCP views, click in the ADCP view to make it “active”.



- Open the **Active** menu.
- Select **ADCP View Settings**.
- On the left side of the **ADCP View Settings** dialog box, select **Horizontal Axis** page.
- Enable the label you wish to see.

Description

The following label options are available.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).

- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

The labels can be changed on the **Horizontal Axis** page in the **Echogram** dialog box.

Labels for the ADCP views can be changed on the **Horizontal Axis** page in the **ADCP View Settings** dialog box.

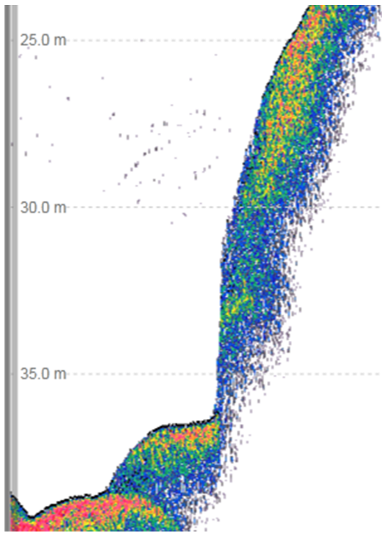
This is a visual enhancement. It does not have any effect on the EK80 performance.

Related topics

Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

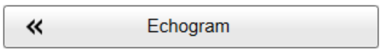
Scale Lines description

In order to estimate the depth of the bottom and/or your echoes, you can place scale lines in the presentation. These are a chosen number of horizontal lines placed in your echogram view. The scale lines are also present in your ADCP views. Each line represents a certain depth.



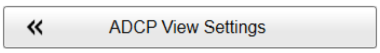
How to open

To activate the scale lines, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Select **Scale Lines**.

To activate the ADCP scale lines, click in the ADCP view to make it "active".



- Open the **Active** menu.
- Select **ADCP View Settings**.
- On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
- Select **Scale Lines**.

Description

When enabled, equidistant horizontal scale lines are drawn inside the view in the current foreground colour; black during day and white during night. A maximum of 10 scale lines can be selected. No scale lines are drawn when the scale line count is set to 0 (zero).

This is a visual enhancement. It does not have any effect on the EK80 performance.

Related topics

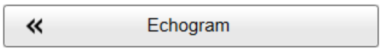
Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

Trawl Line description

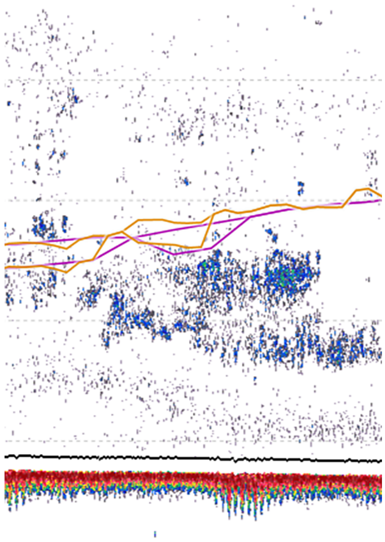
The trawl lines are used to show you where the headrope and/or footrope of your trawl are located.

How to open

To activate the trawl lines, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Select **Trawl Line**.



Description

Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram. If another trawl or catch monitoring system is used, and this system does not provide the trawl opening and/or trawl distance automatically, the values must be entered manually.

If you have a compatible catch monitoring system in use, you can use the trawl lines to monitor the depth of the applicable sensors.

The distance from the headrope to the footrope (trawl opening) can be manually set on the **Trawl** page. This is useful for trawl sensor systems that do not measure the trawl opening, or when the measured distance is unreliable. You can also provide the distance from the vessel to the trawl opening. The depth of the headrope must however be imported from the catch monitoring system. The **Trawl** page is located in the **Installation** dialog box.

This is a visual enhancement. It does not have any effect on the EK80 performance.

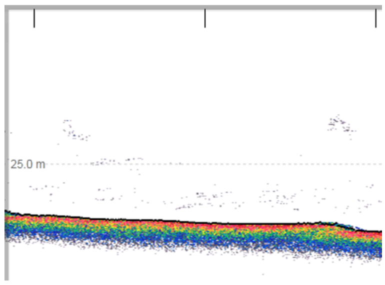
Related topics

Lines and markers, page 519
Setting up the echogram presentation, page 151

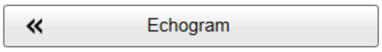
Vertical Tick description

In order to create a horizontal scale, you can add short vertical marker lines to your echogram. Vertical ticks can also be added to your ADCP views. These lines are used to measure time or distance.

How to open

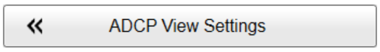


To activate vertical ticks, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Enable the vertical ticks by selecting the type of markers you wish to see.

To activate the ADCP vertical ticks, click in the ADCP view to make it "active".



- Open the **Active** menu.
- Select **ADCP View Settings**.
- On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
- Under **Ticks** select the vertical marker lines you want to use.

Description

This function places short vertical markers on the top of the echogram. These lines are used to measure time or distance. Vertical ticks can also be added to your ADCP views.

- **None**: No vertical markers are shown.
- **Time**: A short vertical line is drawn in the upper part of the echogram once every minute.
- **Distance**: A short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

This is a visual enhancement. It does not have any effect on the EK80 performance.

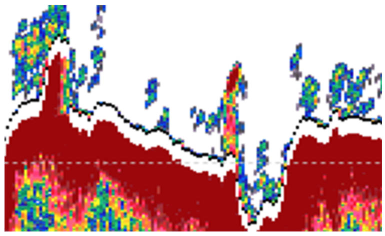
Related topics

Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

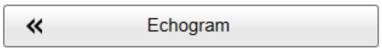
White Line description

A white line can be added to your echogram to enhance the visual bottom detection. It appears as thick line in the current background colour (normally white) that follows the bottom contour. The white line can also be added to your ADCP views.

How to open

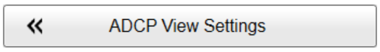


To activate the white line, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Select **White Line**.

To activate the ADCP white line, click in the ADCP view to make it "active".



- Open the **Active** menu.
- Select **ADCP View Settings**.
- On the left side of the **ADCP View Settings** dialog box, select **Lines** to open the page.
- Under **Bottom** select **White Line** and/or **Bottom Line** to suit your preferences.

Description

The white line will not remove information, it will simply "push" the echo information further down in order to make the bottom easier to see. You can use the white and the bottom lines simultaneously.

This is a visual enhancement. It does not have any effect on the EK80 performance.

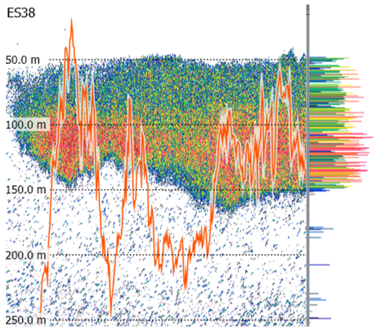
Related topics

Lines and markers, page 519
Setting up the ADCP presentation, page 212
Setting up the echogram presentation, page 151

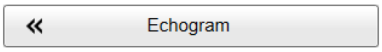
Biomass Line description

Use the biomass line to monitor the current biomass in the echogram. This function writes an extra thick and brightly coloured curve on the echogram.

How to open



To activate the biomass line, click in the echogram view to make it active.



Select **Echogram** on the **Active** menu. On the left side of the **Echogram** dialog box, select **Lines** to open the page. Select **Biomass Line**.

Description

A biomass line can be added to your echogram to retrieve additional information. This function writes an extra thick and brightly coloured curve on the echogram. The biomass line shows you the integrated biomass for the pings within the selected calculation interval. This is a visual enhancement. It does not have any effect on the EK80 performance.

Note

If you have other echo sounders or sonars running asynchronous with the EK80, these systems may cause interference. The EK80 may detect and measure the transmit pulses from other hydroacoustic systems, and these pulses have an effect on the biomass calculations. To avoid all interference, a full synchronization of the various acoustic instruments is required. If your own vessel produces excessive noise this will also be taken into the biomass calculations and give you inaccurate data.

The EK80 records all the targets from the smallest plankton to the largest whale. The biomass value is an indicator to how much fish you currently have in the beam. Every single fish will emit an echo, and the sum of all these registered echoes are presented as a number. Smaller organisms such as plankton will also emit echoes, but these are so weak that they will hardly influence on the total biomass.

The biomass value provides you with information about the fish abundance, and as such it may help you to decide if it pays off to start fishing. However, you must consider if the biomass value is a result of large amounts of plankton or bait, or if you have "real fish" below the keel. The biomass value is relative, and after some use your experience will be a valuable factor when the decision is made.

Change the scale to fit the vertical space available on the echogram. To add the biomass line to the echogram and change the scale, open the **Lines** page in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

Tip

You can also measure the biomass in the Biomass information pane. The Biomass information pane displays an index of the biomass in the current view. The biomass index is the s_A *value, or Nautical area scattering coefficient (NASC), measured with unit* m^2/nmi^2.

Changes made in the **Calculation Interval** dialog box have effect on the line.

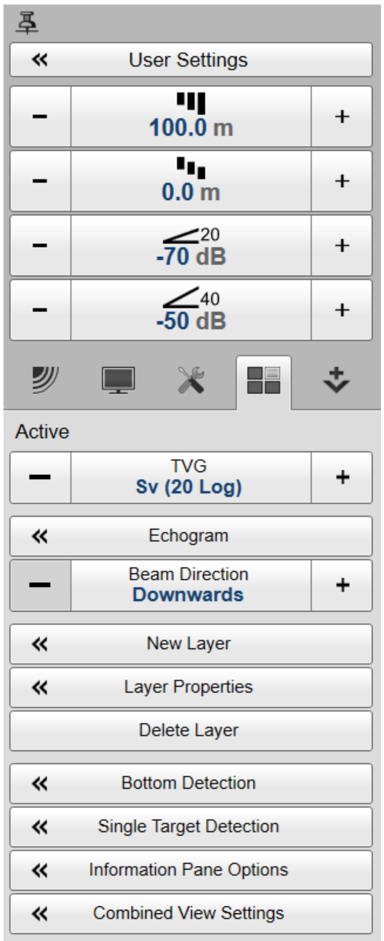
Related topics

Lines and markers, page 519
Setting up the echogram presentation, page 151

The EK80 menu system

The menu system is by default located on the right side of the EK80 presentation. The menus are organized in a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

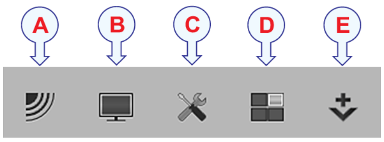
Description



To change operational settings in the EK80, observe the menu system and its tree structure. It offers a main menu, a set of secondary menus, and several menu buttons. Each button shows the purpose of the button. Some of them also display the current setting.

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.

Below the **Main** menu, a set of dedicated icons are used to open the secondary menus.



A **Operation menu**: The **Operation** menu allows you to control the operating mode, the recording functionality, and how the EK80 transmits (ping) into the water.

B **Display menu**: The **Display** menu provides basic functions related to the screen behaviour and presentation of EK80 data.

C **Setup menu**: The **Setup** menu provides basic functions related to the EK80 installation parameters and its communication with peripheral systems.

D **Active menu**: The **Active** menu offers parameters related to current views and data presentations shown by the EK80.

E **Extras menu**: The **Extras** menu is - in spite of its name and location - not a menu at all. This "menu" opens a small view to monitor key operational parameters.

Tip

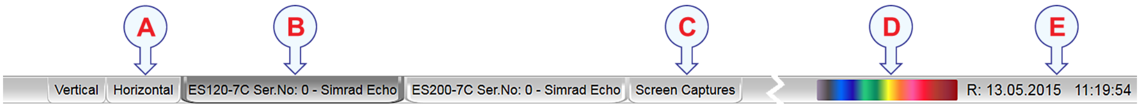
Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the EK80 presentation. This gives you more space for echo information. To hide the menu, select **Menu** *on the top bar. To retrieve the menu, select* **Menu** *one more time. When the menu is hidden, it is temporarily shown on the left or right side of the EK80 presentation if you move the cursor to that position.*

Bottom bar description

The bottom bar is located at the bottom of the EK80 presentation and stretches from the far left to the far right. The tabs on the bottom bar allows you to choose channel and presentation mode. A dedicated tab provides a special view for you to see the screen captures you have made. The bottom bar also shows you the current echogram colour scale, as well as the time and date for the last ping.

How to open

The bottom bar is available all the time.



Description

The number of tabs available on the bottom bar depends on how many channels your EK80 has. Two tab "groups" allow you to select channels and views. This example shows the EK80 with two channels. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

A **Presentation modes**

Three presentation modes are available when you wish to see all the echogram channels simultaneously in the EK80 presentation. The three tabs will arrange the echogram views vertically, horizontally, or in rectangular rows and columns.

The **Vertical** and **Horizontal** tabs are only shown if you have two or more channels in use on your EK80. The **Square** tab is only shown if you have three or more channels.

By default, the views are arranged automatically in the EK80 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

B **Selecting individual echogram channels**

Each channel is shown with a dedicated tab. The channel is identified with the name of the transducer in use. This name is the custom name you provided when you installed the transducer. Select a specific transducer tab to see only that channel in the EK80 presentation. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

C **Screen Captures**

While using the EK80 you may wish to make a screen capture to save an instantaneous copy of the current presentation. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk.

The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.

D **Colour Scale**

The colour scale on the bottom bar reflects the colour choice you have made for the echo presentations. The colour scale is shown on the bottom bar even when the *Colour Scale* information pane is closed. To change the colour scale, use the **Colour Setup** dialog box. You open the **Colour Setup** dialog box from the **Display** menu.

E **Date and time**

The date and time for the last ping is shown on the right side of the bottom bar. During replay, the date and time recorded with the data file are shown. The date is then shown with prefix "R:" to indicate that a replay is in progress.

If you have many channels with long names on your EK80, a small icon appears on the bottom bar. You can use this icon to scroll the bottom bar sideways.

Related topics

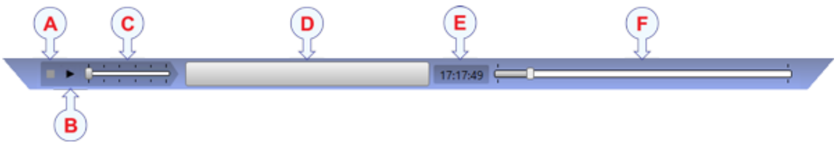
Setting up presentation modes and views, page 238
Saving and recalling screen captures, page 148
Defining settings related to user preferences and individual customizing, page 245

Replay bar description

During replay, the dedicated replay bar is shown immediately under the top bar. The replay bar allows you to retrieve saved files, and to control the playback.

How to open

The replay bar is opened automatically when **Operation** is set to *Replay*.



Description

All playback is controlled by the replay bar. During data playback, the replay offers visual monitoring of the speed and progress. You can also edit the list of replay files that are used.

A **Stop**: Select this button to stop the playback. The replay bar is not removed from the presentation until you select another operating mode.

B **Play/Pause**: Select this button to start the playback, or to pause it.

C **Replay Speed**: Select this slider and move it sideways to adjust the replay speed.

D **Replay File**: The button shows you which file you are replaying. Select the button to open the **Replay File** dialog box.

E **Elapsed Time**: This is the elapsed time of the replay sequence.

F **Playback Progress**: This bar shows you the progress of the replay sequence. If you have chosen to restart the replay file(s) automatically (in a loop), the green indicator starts from left every time the file restarts.

Tip

To select Replay operational mode, use the **Operation** *function. The* **Operation** *function is located on the* **Operation** *menu. If you wish your playback file to run continuously, select* **Loop** *in the* **Replay File** *dialog box.*

Related topics

Recording and replaying raw echo data, page 127

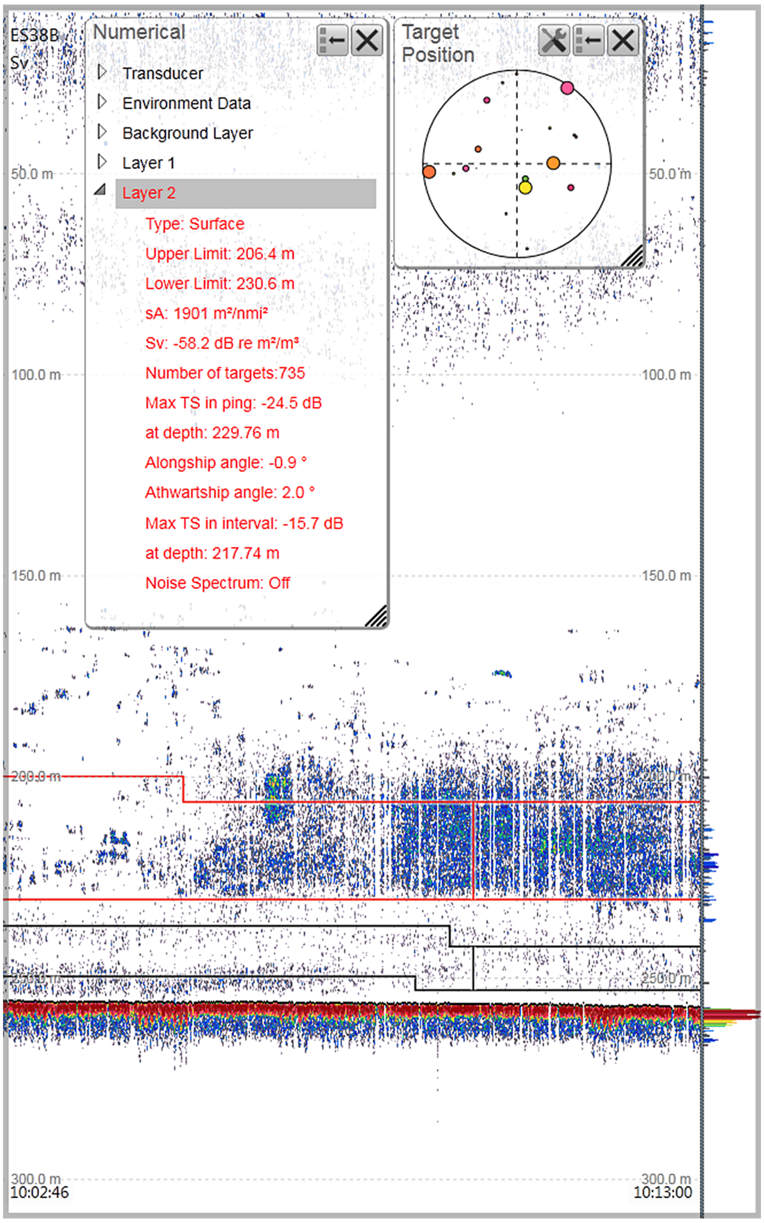
Working with depth layers

Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis.

Description

Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.



Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

Note

The layers are a key function of the EK80. During normal operation, make sure that you are aware of the layer(s) that you have established, and that the requested layer is activated to feed information to the information panes.

You can create as many depth layers as you want on the EK80. By default, any layer you create will be applied to all echogram views simultaneously. The layers may overlap if necessary, and you can control how much they overlap each other.

When you are working with layers, the following functionality is available.

- To create a new layer, use the **New Layer** dialog box. The **New Layer** dialog box is located on the **Active** menu.
- In the echogram, you can click between the layer lines in the echogram view to select ("activate") it. The active layer is shown with red border lines.

Note

The information shown in your information panes only reflect the echo data from the currently "active" layer.

If you wish your information panes to show data from the entire water column, you must either click "outside" the layer(s) in your echogram to deselect all of them. This will "activate" the default background layer. Another option is to simply delete all the layers.

- Once a depth layer has been made you can change its properties using the **Layer Properties** dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view. The lines in the echogram will reflect the changes you make, but these will disappear to the left after some time. Observe that vertical lines are drawn in the echogram to identify the start of each calculation interval. The **Layer Properties** dialog box is located on the **Active** menu.
- A single layer can be deleted if you do not need it any longer. To delete a layer, select it in the echogram or in the *Numerical* information pane (layer data shown with red text), and then click **Delete Layer**. The **Delete Layer** function is located on the **Active** menu.
- When you record raw data, the layers you have defined are not included. This means that you can also use the layer functionality during replay.
- Each of the depth layers can be used to measure the background (ambient) noise in the water column.
- The *Numerical* information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Related topics

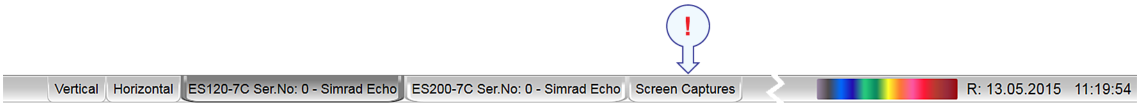
User interface introduction, page 60

Screen capture browser description

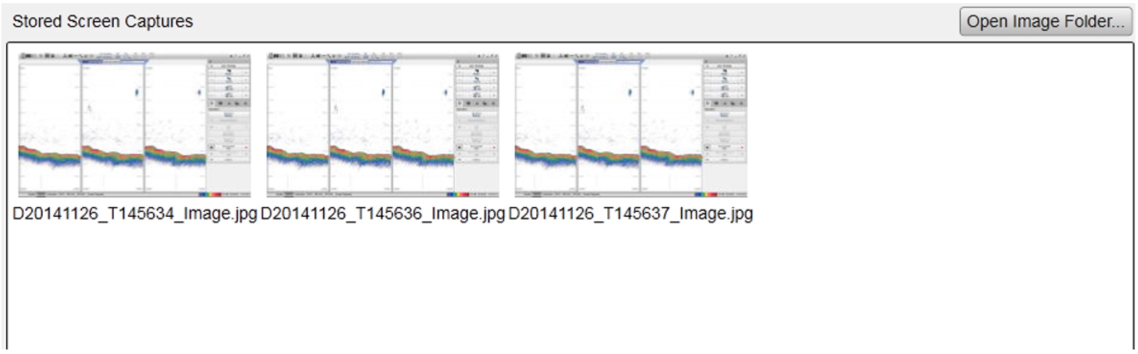
The EK80 provides a built-in screen capture function to create snapshots of the echogram presentation. The EK80 also provides a dedicated browser to view the saved images.

How to open

To open the screen capture browser, select the **Screen Captures** tab on the bottom bar.



To close the browser, click any of the other tabs on the bottom bar.



Description

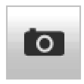
The screen capture browser simply presents a miniature version of each screen capture that you have made. Each file is provided in standard JPG format, which can be opened by most commercial bitmap editors. The file names are created automatically using the date and time when you used the **Screen Capture** button.

Double-click a miniature image to open it. Once opened, select **Return to Browser** to return to the browser view.

To find the image files, select **Open Image Folder** in the image browser. By means of standard operating system functionality you can move, copy or delete each image file.

Tip

To make a copy of the EK80 presentation, select **Screen Capture** *on the top bar. Every time you do this a new image file is created. Each capture includes the entire presentation. Each screen capture you make is saved in* `.jpg` *format on the Processor Unit hard disk.*



Related topics

Saving and recalling screen captures, page 148

Context sensitive on-line help

Installed on your EK80 you will find a comprehensive context-sensitive online help system. Everything you can read in the EK80 Reference Manual can also be found in the online help.

The context sensitive on-line help is provided using a *WebHelp* installation using HTML format. It uses the default web browser on the Processor Unit.

To open the help system, select **Help** in any dialog box. This will provide instantaneous information about the relevant dialog box. Links to related procedures and topics are provided.

You navigate in the help file using the menu system on the left side as well as the interactive links within the document.

Note

To open the online help on its start page, select **Help** *on the top bar. To read about a dialog box and the options provided, select the* **[?]** *button in its top right corner.*

The EK80 help may not be available for the language you have chosen for the user interface. If your language is not supported, the English help is provided.

Menu system

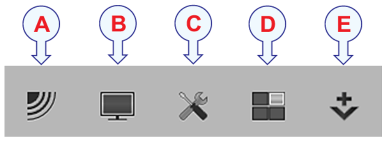
Topics

About the menus and menu buttons

To select operational parameters on the EK80, use the menu system. The menus are organized in a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices. The menu system is by default located on the right side of the EK80 presentation.

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.

Below the **Main** menu, a set of dedicated icons are used to open the secondary menus.



A **Operation menu**: The **Operation** menu allows you to control the operating mode, the recording functionality, and how the EK80 transmits (ping) into the water.

B **Display menu**: The **Display** menu provides basic functions related to the screen behaviour and presentation of EK80 data.

C **Setup menu**: The **Setup** menu provides basic functions related to the EK80 installation parameters and its communication with peripheral systems.

D **Active menu**: The **Active** menu offers parameters related to current views and data presentations shown by the EK80.

E **Extras menu**: The **Extras** menu is - in spite of its name and location - not a menu at all. This "menu" opens a small view to monitor key operational parameters.

Tip

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the EK80 presentation. This gives you more space for echo information. To hide the menu, select **Menu** *on the top bar. To retrieve the menu, select* **Menu** *one more time. When the menu is hidden, it is temporarily shown on the left or right side of the EK80 presentation if you move the cursor to that position.*

Using the “smart” menu buttons

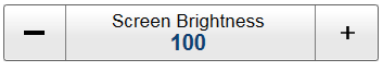
Each menu provided by the EK80 contains several menu buttons. Each button shows the purpose of the button. Some of them also display the current setting.

Depending on the properties of each individual button, several methods can be used to change settings.

- Select the *left* side of the button to *decrease* the numerical value. Select the *right* side of the button to *increase* the numerical value.

- Press and hold the left mouse button. Move the cursor *right* to increase the value. Move the cursor *left* to decrease the value.
- Spin the scroll wheel in either direction to increase or decrease the numerical value.
- Type the required setting using a computer keyboard (if you have one connected to your Processor Unit).
- Select the button to open the button menu. Choose the required setting.
- Select the button to open the dialog box.

Choosing a setting with the [+] and [–] buttons



1. To change the setting, move the cursor to either side of the button.
2. Observe that the background colour changes.
   a. Select the *left* side of the button to *decrease* the numerical value.
   b. Select the *right* side of the button to *increase* the numerical value.

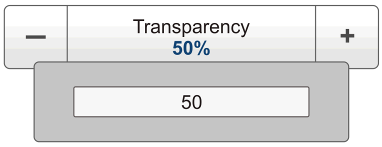
Choosing a setting by moving the cursor horizontally

1. Place the cursor on the button.
2. Press and hold the left mouse button.
3. Move the cursor horizontally over the button.
   a. Move the cursor *right* to increase the value.
   b. Move the cursor *left* to decrease the value.
4. Release the mouse button when requested value is shown.

Choosing a numerical setting with the scroll wheel

1. Place the cursor on the button.
2. Spin the scroll wheel in either direction to increase or decrease the numerical value.
3. Release the scroll wheel when the requested value is shown.

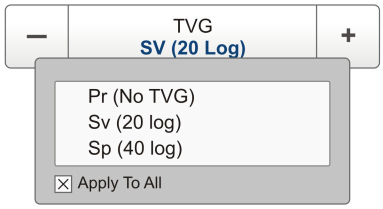
Choosing a setting with the keyboard



1. Place the cursor on the button.
2. Select the button to open the text field.
3. Type a numerical value.

   If the value exceeds the permitted range, the frame turns red. Type a new value within the accepted range.
4. Press **Enter** on the keyboard.

Choosing a setting on the button menu



1 Place the cursor on the button.

2 Select the button to open the button menu.

3 Choose the required setting.,

The chosen setting is applied, and the menu closes automatically.

Tip

Several of the functions offer **Apply to All**. *If you select* **Apply to All** *your setting is applied to all the views simultaneously.*

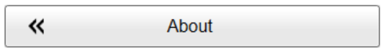
---

4 Whenever applicable, you can make a selection by selecting the left or right side of the button. This method does not show you the menu choices.

a Select the *left* side of the button to select a "lower"' menu choice.

b Select the *right* side of the button to select a "higher"' menu choice.

Selecting settings using a dialog box



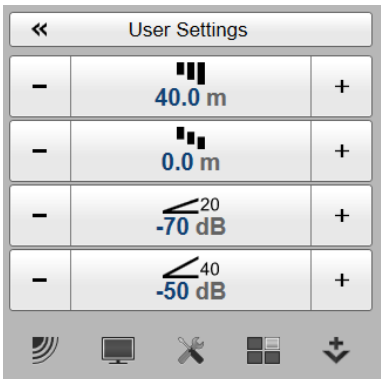
Select the button to open the dialog box.

Once you have made the necessary settings, most dialog boxes provide the following options:

- Select **OK** to save the selected settings and close the dialog box.
- Select **Apply** to save your settings without closing the dialog box.
- Select **Cancel** to close the dialog box without making any changes.

Main menu

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.



How to open

By default, the **Main** menu is open. It is placed on the right side of the EK80 presentation.

Description

Only brief descriptions are provided. For detailed information about each function and dialog box, follow the relevant link.

Tip

If you do not need to use the menu system, you can hide it. This allows more space for the EK80 presentation.

Use **Menu** *on the top bar to hide or show the menu.*

When the menu system is hidden, it appears temporarily on the left or right hand side of the screen if you move the cursor to that position.

Below the **Main** menu you find the icons for opening (and closing) the secondary menus. Select an icon to open the relevant menu, and reselect the icon to close the menu.

Functions and dialog boxes

- **User Settings**

  The **User Settings** dialog box allows you to save the current user settings (your current selection of operational parameters), and to retrieve factory or previously saved user settings.

  User Settings dialog box, page 561

- **Range**

  The **Range** function allows you to specify the maximum theoretical vertical depth covered by the EK80. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value selected and shown is by default only applied to your active echogram.

  Range function, page 564

- **Start Range**

  The **Start Range** function allows you to specify the start depth of the echogram. The value defines from which depth in the water column the presentation shall start. The depth value shown and selected is by default only applied to the currently selected echogram.

  Start Range function, page 565

- **Minimum Level**

  The purpose of the **Minimum Level** function is to adjust the echo sensitivity in the EK80 presentations. It controls how weak or strong an echo needs to be to be shown in the echograms. The setting is by default only applied to currently selected echogram. There are two minimum level buttons, one for each TVG setting (*20 log R* and *40 log R*).

  Minimum Level function, page 567

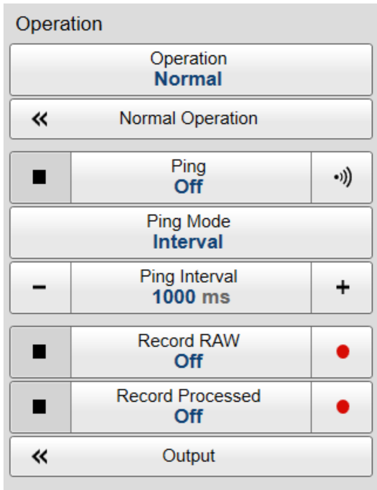
Operation menu

The **Operation** menu offers the most common functions for basic EK80 operation.

How to open

Select the **Operation** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.



Note

Immediately after you have turned on the EK80, the **Operation** *icon is flashing. The icon is flashing to indicate that even if the EK80 is turned on, "pinging" is disabled.* **Ping** *is set to Off to prevent transmission ("pinging"). This is for safety reasons.*

Description

Only brief descriptions are provided. For detailed information about each function and dialog box, follow the relevant link.

Tip

If you do not need to use the menu system, you can hide it. This allows more space for the EK80 presentation.

Use **Menu** *on the top bar to hide or show the menu.*

When the menu system is hidden, it appears temporarily on the left or right hand side of the screen if you move the cursor to that position.

Functions and dialog boxes

- **Operation**

  The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*. To activate *Mission* mode a mission plan must have been created previously.

  Operation function, page 569

- **Normal Operation**

  The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements.

  Normal Operation dialog box, page 572

- **Select Mission**

  The **Select Mission** function enables you to select a predefined mission plan. **Select Mission** is only visible on the menu if a mission plan exists.

  Select Mission function, page 578

- **Ping**

  The purpose of the **Ping** function is to enable or disable the EK80 transmissions into the water. Such transmissions are often referred to as "pinging".

  Ping function, page 579

- **Ping Mode**

  Use **Ping Mode** to control how often the EK80 shall transmit its energy into the water. For scientific operations, choose *Interval*, and select a **Ping Interval** value according to the survey requirements.

  Ping Mode function, page 580

- **Ping Interval**

  The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function permits you to choose the time (in milliseconds) between each transmission ("ping").

  Ping Interval function, page 581

- **Record RAW**

  Record RAW allows you to record the *unprocessed* echo data received by the transducer. You can save the data to the Processor Unit hard disk, or onto an external storage device. The data files can be played back on the EK80. You can keep the recorded files for scientific studies, future references or for training purposes.

  Record RAW function, page 582

- **Record Processed**

  The **Record Processed** function allows you to record the *processed* echo data received by the transducer. Which processing to apply is controlled by the **Processed Data Output** settings in the **Output** dialog box.

  Record Processed function, page 584

- **Output**

  A key function of the EK80 is its ability to export data. The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location.

  Output dialog box, page 586

  The following pages are provided.

  – **File Setup**

    A key function of the EK80 is it ability to record echo data. To retrieve the data files you need to know where they are, and which file names that have been used. The purpose of **File Setup** is to define the file and folder properties for the data files that you are recording. You can select the disk and folder for the files, the maximum file size, and a prefix for the file names.

    File Setup page, page 632

  – **I/O Setup**

    In order to communicate with peripheral devices, the Processor Unit offers several serial and/or Ethernet (LAN) ports. The number of communication ports depends on how your Processor Unit is set up and configured. The **I/O Setup** settings allow you to define which information is imported by the Processor Unit.For each port, you can set up the communication parameters, and monitor the data flow.

    I/O Setup page, page 636

  – **Processed Data to Output**

    Use **Processed Data to Output** to define which processed data formats to export, and which communication port to use.

    Processed Data to Output page, page 640

  – **Processed Data to File**

    Use **Processed Data to File** to define which processed data formats to save, and where to place the files.

    Processed Data to File page, page 642

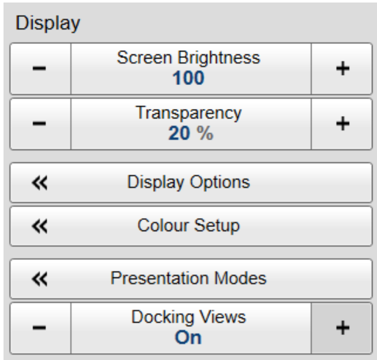
– **Relay Output**

The EK80 allows you to export the same sensor data that was originally imported. This can "reuse" the same information on other systems. The **Relay Output** page is used to set up and control this export functionality.

Relay Output page, page 645

Display menu

The **Display** menu provides basic functions related to the screen behaviour and presentation of EK80 data.



How to open

Select the **Display** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

Only brief descriptions are provided. For detailed information about each function and dialog box, follow the relevant link.

Tip

If you do not need to use the menu system, you can hide it. This allows more space for the EK80 presentation.

Use **Menu** *on the top bar to hide or show the menu.*

When the menu system is hidden, it appears temporarily on the left or right hand side of the screen if you move the cursor to that position.

The choices in the this menu depends on which view in the EK80 presentation that is currently "active". The menu may therefore change from one view to another. The screen capture may not show you all the menu choices.

Functions and dialog boxes

- **Screen Brightness**

  The intensity of the light given off by the EK80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light.

  Screen Brightness function, page 587

- **Transparency**

  When you open an information pane, you will see that it is transparent. The transparency can be adjusted.

  Transparency function, page 588

- **Display Options**

  The top bar gives you fast access to key functionality and navigational information. It provides buttons to hide or show the menu, to monitor data recording, to open the **Messages** dialog box, and to open the context sensitive on-line help. Which navigation elements to see on the top bar is selected in the **Display Options** dialog box. It controls the location of the menu. You can also select which tooltips to appear when you move the cursor over the echo information.

  Display Options dialog box, page 589

  – **General**

    The **General** page in the **Display Options** dialog box controls the location of the menu. You can select which navigational information to be shown on the top bar. You can also choose to see Coordinated Universal Time (UTC) at the bottom of the presentation.

    General page, page 648

  – **Tooltip**

    When you move the cursor over the echograms in the EK80 presentation, small "tooltips" are shown to provide additional information. The **Tooltip** page controls which tooltips that are shown.

    Tooltip page, page 651

- **Colour Setup**

  The **Colour Setup** dialog box controls the presentation colours used by the EK80. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation

  Colour Setup dialog box, page 589

- **Presentation Modes**

  The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.

  Presentation Modes dialog box, page 591

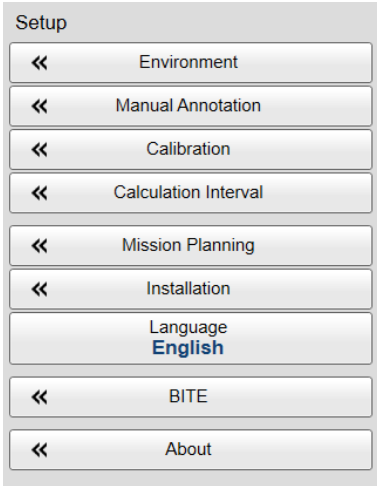
- **Docking Views**

  The echograms take up the largest part of the EK80 presentation. The information from each channel is shown in a separate view. The **Docking Views** function provided by the EK80 allows you to rearrange the physical positions of the views, and change their sizes.

  Docking Views function, page 593

Setup menu

The **Setup** menu provides basic functions related to the EK80 installation parameters and its communication with peripheral systems.



How to open

Select the **Setup** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

- **Environment**

  Environmental parameters such as salinity, sound speed and water temperature all play an important part to present accurate echo data. Use the **Environment** parameters to define these values.
  Depending on the current sea and weather conditions, you may need to change these values frequently.

  Environment dialog box, page 595

- **Manual Annotation**

  Sometimes it can be useful to place a single written comment on the echogram. The **Manual Annotation** dialog box offers that function. Type a text string. Select **OK** in the dialog box to add the text to your echogram.

  Manual Annotation dialog box, page 596

- **Calibration**

  The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.

  Calibration function, page 597

- **Calculation Interval**

The **Calculation Interval** settings define the parameters that are used to calculate the biomass and the size distribution. You can base the calculations on sailed distance, elapsed time, or a number of pings.

Calculation Interval dialog box, page 599

- **Mission Planner**

  The **Mission Planner** dialog box offers a planning and programming tool for compound EK80 operation. In the **Mission Planner** dialog box you can create, edit and remove mission plans and all elements included in mission plans. A mission plan includes ping, ping groups and ensembles.

  Mission Planner dialog box, page 601

- **Installation**

  Before you use the EK80 you must set it up to communicate with the relevant peripherals. This includes the transducer(s). Use the **Installation** dialog box to set up all interfaces with external devices, and to set up basic parameters related to installation and operation. In most cases, you only need to do this once.

  Installation dialog box, page 602

  The following pages are provided.

  – **Transducer Installation**

    The transducers you wish to use with the EK80 must be "installed" as a part of the software configuration. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these. Unless you replace a broken transducer, or add a new, you only need to do this once.

    Transducer Installation page, page 673

  – **Transceiver**

    The **Transceiver** pages are used to define the settings necessary to connect the Processor Unit to each transceiver. In turn, each transceiver is assigned one or more transducers. Two pages are used. The **Transceiver Installation** page shows you a list of the available transceivers, and allows you to make the connections to the Processor Unit, and to the transducers you have installed. The **Transceiver IP Address** page allows you to control the Internet Protocol (IP) Addresses used by the Processor Unit to communicate with the transceivers.

    Transceiver pages, page 677

  – **I/O Setup**

    In order to communicate with peripheral devices, the Processor Unit offers several serial and/or Ethernet (LAN) ports. The number of communication ports depends on how your Processor Unit is set up and configured. The **I/O Setup** settings allow you to define which information is imported by the Processor Unit.For each port, you can set up the communication parameters, and monitor the data flow.

    I/O Setup page, page 636

– **Sensor Installation**

For the EK80 to use and offer correct navigational information, one or more external sensors must be connected. Typical sensors are those providing navigational information (heading, speed or geographical position). Use the **Sensor Installation** page to define which external sensors your EK80 will import information from. You must also specify which datagram formats to use. For each relevant sensor you must insert the offset values that define the its physical location relative to the vessel's coordinate system.

Sensor Installation page, page 689

– **Sensor Configuration**

With several sensors connected to the EK80, many of them will provide the same datagrams. We cannot expect that the datagrams provide the same information. The **Sensor Configuration** page allows you to define a datagram priority, so that the information from the "most reliable" sensor is used by the EK80. You can also define manual values in case a sensor is unserviceable, or not installed.

Sensor Configuration page, page 694

– **Synchronization**

The purpose of the **Synchronization** parameters is to set up the EK80 to operate alone, or as a master or slave in a synchronized system. Synchronization is required in order to avoid interference if the EK80 is used simultaneously with other hydroacoustic instruments within the same frequency range.

Synchronization page, page 696

– **Units**

The EK80 user interface presents many measurements. These measurements are for example related to depth, range and distance. From the **Units** page you control which units of measurements that are used.

Units page, page 699

– **Trawl**

When you use a trawl, the EK80 can draw the upper and lower trawl lines in the echogram. In order to this, the EK80 needs to know the relevant trawl parameters. If your trawl system is connected to the EK80, these parameters are automatically available. If the trawl system is not connected, the **Trawl** options allow you to define the parameters manually.

Trawl page, page 701

– **Annotations**

When you study an echogram, it is often useful to add personal comments to it. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. The **Annotations** choices allow you to type comments and annotations into the echograms. The comments are automatically saved when you enable raw data recording.

Annotations page, page 702

– **Remote Control**

  The EK80 can be set up to operate as a "sensor" in a larger scientific system. Everything the EK80 do is then remotely controlled from another computer on the local area network (LAN). The **Remote Control** settings allow you to set up remote controlled operation. You define how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this and other systems.

  Remote Control page, page 705

– **Client Server Configuration**

  By means of the EK80 Client application, you can monitor the survey operations made on the EK80. The necessary settings required to allow the client to communicate with the EK80 are defined on this page.

  Client Server Configuration page, page 708

– **Software License**

  The EK80 needs one or more software licenses to work. Each software license code "unlocks" one Wide Band Transceiver (WBT) for operational use with a set of predefined properties. The **Software License** settings allow you to type a license code (text string) to unlock the EK80 functionality.

  Software License page, page 709

• **Language**

  You may prefer to use the EK80 with a user interface in your own language. A selection of languages is provided. The **Language** function allows you to select the language to be used in the EK80 presentations, menus and dialog boxes.

  Language function, page 603

• **BITE (Built-In Test Equipment)**

  The EK80 is a computerized Wide band scientific echo sounder. There are hardly any analogue circuitry, and the possibility of traditional troubleshooting is limited. In order to rectify this, a built-in software application is available to offer test and maintenance functionality. The **BITE** (Built-In Test Equipment) dialog box controls the test and diagnose program that checks the performance of the EK80.

  BITE (Built-In Test Equipment) dialog box, page 604

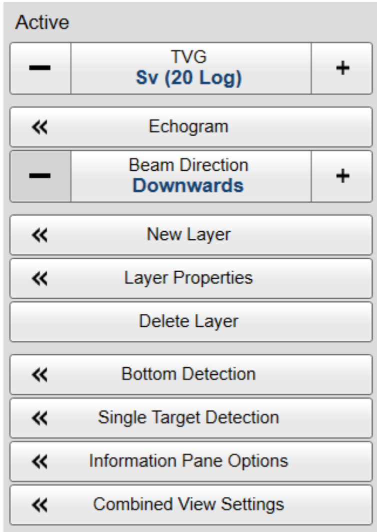
• **About**

  Every EK80 software release is uniquely identified. The **About** dialog box identifies the current EK80 software version with its release date. The version described in this Reference Manual is 2.0.0.

  About dialog box, page 605

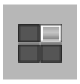
Active menu

The **Active** menu offers parameters related to current views and data presentations shown by the EK80.



How to open

Select the **Active** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

- **TVG (Time Variable Gain)**

  TVG (Time Variable Gain) compensates for the loss of acoustic energy due to geometric spread and absorption. This makes the targets with the same strength appear with the same intensity independent of their physical distance from the transducer.

  TVG (Time Variable Gain) function, page 609

- **Echogram**

  The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. Two pages control the horizontal lines and the echogram type with applied TVG (time variable gain). One page controls how fast the echogram travels horizontally across the presentation.

  Echogram dialog box, page 610

- **Beam Direction**

  The purpose of the **Beam Direction** function is to turn the echogram presentation up-side down. This is typically used if the EK80 transducers are located on the seabed, or on the bottom of a fish cage, facing upwards.

  Beam Direction function, page 611

- **New Layer**

  Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis. The **New Layer** dialog box is used to create and insert a new depth layer.

  New Layer dialog box, page 612

- **Layer Properties**

  The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view.

  Layer Properties dialog box, page 616

- **Delete Layer**

  To delete a layer, select it in the echogram or in the *Numerical* information pane (layer data shown with red text), and then click **Delete Layer**.

  Delete Layer function, page 620

- **Bottom Detection**

  Locating the bottom is important for the EK80. The purpose of the **Bottom Detection** parameters are to define the upper and lower depth limits most likely to be used during the EK80 operation. You can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

  Bottom Detection dialog box, page 621

- **Single Target Detection**

  The **Single Target Detection** parameters are used to control the operational settings for the detection of single targets. In order to detect single fish correctly, these parameters must be defined to suit the target characteristics. The chosen settings do not have any effect on the raw data you save during the survey.

  The **Single Target Detection** parameters are available both as a dialog box and a page. The dialog box is opened from the **Active** menu. The page is opened in the **Information Pane Options** dialog box. The **Single Target Detection** dialog box is also used by the **Calibration** wizard.

  Single Target Detection dialog box, page 624

- **Information Pane Options**

  The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. Several of the information panes are fitted with a **Setup** button. Select **Setup** to open the **Information Pane Options** dialog box. Use the **Information Pane Options** dialog box to change the operating parameters for the data provided in the information panes.

  Information Pane Options dialog box, page 628

  The following pages are provided.

  – **Bottom Detection**

    Locating the bottom is important for the EK80. The purpose of the **Bottom Detection** parameters are to define the upper and lower depth limits most likely to be used during the EK80 operation. You can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

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Single Target Detection dialog box, page 624

– **Calculation Interval**

The **Calculation Interval** settings define the parameters that are used to calculate the biomass and the size distribution. You can base the calculations on sailed distance, elapsed time, or a number of pings.

Calculation Interval dialog box, page 599

– **Colour Scale**

The colour scales used by the EK80 are designed to reflect how strong the echoes are. The echo strength is measured in decibels (dB). Each colour in the scale represents an increase (or decrease) in the echo strength. In the basic colour scale with 12 colours, each colour represents a 3 dB step. The **Colour Scale** parameters allow you to change the echo strength range (in decibels) that each colour represent.

Colour Scale page, page 724

– **TS Histogram**

The *TS Histogram* information pane shows a histogram of the echoes detected from single fishes. The calculations are based on the fact that different fish species have different echo strength. The echo strength also depends on the operating frequency you use. Use the **TS Histogram** page to define the properties for the histogram shown in the *TS Histogram* information pane.

TS Histogram page, page 727

– **Sv(f)**

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them. The **Sv(f)** page controls the properties used to create the *Sv(f)* information pane.

Sv(f) page, page 728

– **TS(f)**

  The *TS(f)* information pane offers an analysis of the target strength for single targets versus frequency. The pane allows you to identify the nature of the individual targets, and discriminate between them. The **TS(f)** page controls the properties used to create the *TS(f)* information pane.

  TS(f) page, page 729

- **Combined View Settings**

  The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. In order to collect information from more than one channel in the *Sv(f)* information pane, you can use the **Combined View Settings** functionality to "combine" echo data from several channels.

  Combined View Settings, page 628

Context sensitivity

The choices in the this menu depends on which view in the EK80 presentation that is currently "active". The menu may therefore change from one view to another. The name of the currently active view is identified at the top of the menu. The screen capture may not show you all the menu choices.

Note

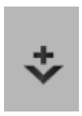
Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. *If you select* **Apply to All** *your setting is applied to all the views simultaneously.*

Extras menu

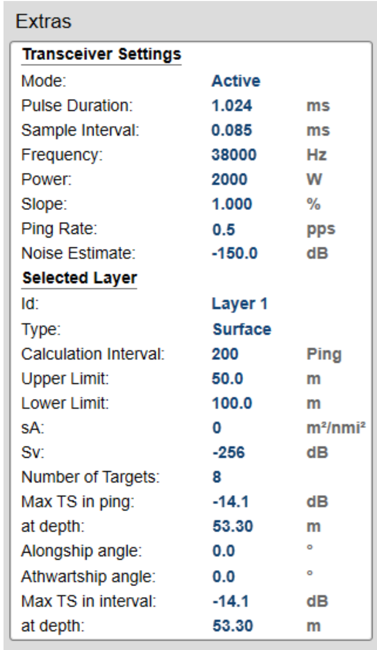
The **Extras** menu is - in spite of its name and location - not a menu at all. This "menu" opens a small view to monitor key operational parameters.

How to open

Select the **Extras** icon. The icon is located under the **Main** menu. Select the icon one more time to close the menu.



Description



The **Extras** "menu" gives you an overview of the main operational parameters. The information is based on the currently "active" echogram.

Additional information is added about the currently "active" layer. In this context, the phrase layer is used to describe the depth layers that may be defined for the EK80 echograms. Each layer is defined by its upper and lower depth limit.

Note

Some of the settings are specific for echo sounder or ADCP operation.

Transceiver settings

Mode

The operating mode is controlled by **Operation** on the **Operation** menu. You can set it to *Normal*, *Replay* or *Inactive*. To activate *Mission* mode a mission plan must have been created previously. This information is also provided in the *Numerical* information pane.

Pulse Duration

The **Pulse Duration** setting specifies the current duration ("length") of the transmitted pulse. You can manually select a pulse duration that suits your operation.

This setting is controlled in the **Normal Operation** dialog box.

This information is also provided in the *Numerical* information pane.

Sample Interval

The information from each EK80 transducer is a continuous flow of analogue data. In signal processing, *sampling* is the reduction of this continuous signal to a discrete signal.We convert a sound wave (which is an analogue *continuous-time signal*) to a sequence of samples (which is a *discrete-time signal*). The *sample rate* is the average number of samples obtained in one second. The *sample interval* is 1/*sample rate* to allow readout in time (normally milliseconds).

This information is also provided in the *Numerical* information pane.

Frequency

This setting is controlled in the **Normal Operation** dialog box. The **Start Frequency** and **End Frequency** parameters are used to set up a frequency sweep ("chirp"). If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wide band transmissions. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Power

The **Power** parameter in the **Normal Operation** dialog box displays the transmitter's output power measured in Watts. You can change the output power manually. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest.

Slope

The **Slope** value identifies how fast the output power in each transmission ("ping") goes from 0 to maximum. The value (in %) indicates the amount of the pulse duration that is spent during this increase. For example, if the **Slope** value is 50%, it means that half the duration of the "ping" is spent building up the power to maximum.

Ping rate

The phrase *ping rate* is used to describe the parameter that controls how often the EK80 can or shall transmit acoustic energy (a "ping") into the water. The ping rate is normally limited by the maximum range settings. It will also be dependant on hardware issues. This may be, for example, how fast your Processor Unit can handle the information from each ping, how fast your system communicates with external peripherals, or how long time the system uses to save data.

The *ping interval* (1/ping repetition frequency (PRF)) is the ping rate measured in time between each transmission.

This information is also found in the **BITE** (Built-In Test Equipment) dialog box. You open the **BITE** dialog box from the **Setup** menu.

Noise Estimate

This value reflects an estimation of the noise level over the transducer bandwidth. For every transmission ("ping") the EK80 measures the echo levels along the chosen range. Typically, these measurements are made every five meters, even for long ranges.

All echoes and noise in the water are recorded. This includes noise generated by your own vessel (electric, propellers, machinery etc), water flow, cavitation and interference. Echoes from fish and other species, as well as from the bottom, are detected and added to the equations.

By comparing these measurements, the EK80 calculates a noise estimate.

Tip

If you set the EK80 to Passive mode, all echoes from the transmissions are removed from the equations. This gives you with better information about the actual noise. If you wish to switch to Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

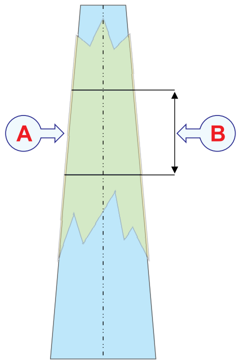
This information is also provided on the **Noise** page in the **BITE** (Built-In Test Equipment) dialog box. You open the **BITE** dialog box from the **Setup** menu.

Depth Cell Size

This setting is controlled in the **Normal Operation** dialog box.

A *Depth cell*

B *Depth cell size*



In water current measurements, the phrase *cell* is used to describe a *depth cell* (sometimes referred to as *bins*). These are uniform segments used by the acoustic Doppler current profiler (ADCP) to measure the velocity of the current.

The acoustic Doppler current profiler (ADCP) measures the speed and direction of the water current by means of acoustic pulses. These pulses have duration decided by the current size of the *depth cell*. Each beam can be seen as a number of depth cells evenly placed from the transducer surface and down to the lower end of the acoustic beam.

- Use smaller depth cells in shallower waters.
- Use larger depth cells in deeper waters.

A small depth cell offers better range resolution. This makes it is easier to detect minor depth variations in the current velocity. On deeper waters, a small depth cell will gradually suffer from more and more noise. The ping rate will also be reduced due to the high amount of processing that is required. A larger depth cell tolerates more noise. For this reason, larger depth cells must be used to measure velocity in deep waters.

This functionality is only available for ADCP operation.

Max(imum) Current Speed

This setting is controlled in the **Normal Operation** dialog box.

Maximum Current Speed controls the pulse duration and the processing functionality for ADCP operation. You do not need to make frequent changes to this setting. Select a value based on the expected water currents in your survey area. If you are uncertain, choose a value *above* the expected water current, and reduce it based on experience. The value you choose must always be equal or larger than the expected value.

Note

The measurement accuracy is reduced if the value is set much too large.

This functionality is only available for ADCP operation.

Maximum Vessel Speed

ADCP operations cannot take place without input from a motion reference unit (MRU). The input must be provided on the KM Binary datagram format.

KM Binary is a proprietary datagram format created by Kongsberg Maritime for general use. This format has very high resolution on timing and sensor parameters. The datagram is provided by a compatible motion reference unit (MRU). If the KM Binary datagram is successfully received, the displayed value is 0.0 knots.

Selected layer

Id (identification)

This value identifies the layer.

Type

This identifies the echogram type in use.

Calculation Interval

The **Calculation Interval** settings define the parameters that are used to calculate the biomass and the size distribution. You can base the calculations on sailed distance, elapsed time, or a number of pings. The current parameter setting is shown.

The **Calculation Interval** parameters can accessed from two places in the EK80 user interface.

- The page is opened in the **Information Pane Options** dialog box.
- The dialog box is opened using the **Calculation Interval** button on the **Setup** menu.

The parameters are the same, it does not matter if you use the page or the dialog box.

Upper Limit / Lower Limit

These parameters identify the depth range covered by the layer.

sA

$\mathbf{s_A}$ is the *nautical area scattering coefficient*. In this context the $\mathbf{s_A}$ value presents the current biomass index. $\mathbf{s_A}$ is commonly abbreviated as *NASC*.

Sv

$\mathbf{S_v}$ is the *volume backscattering strength*. $\mathbf{S_v}$ is commonly abbreviated as *VBS*. The $\mathbf{S_v}$ value identifies the total volume backscatter in the depth layer.

Number of targets

This information identifies the number of individual targets (single fish) in the depth layer.

Max TS in interval ... at depth

These parameters identify the strongest target strength detected, and at which depth.

Alongship angle / Athwartship angle

These parameters identify the alongship and athwartship offset angles for the transducer. These offset angles are taken from the calibration results.

Noise Spectrum

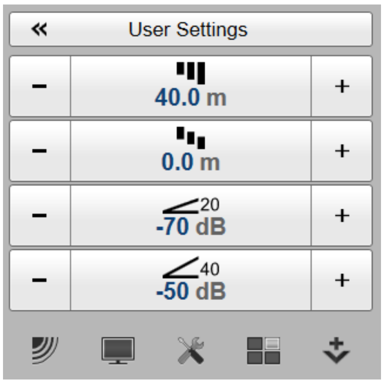
This information is only valid for FM transmissions. The value reflects an estimation of the noise level over the transducer bandwidth. This information is useful for identifying noise sources in both *Passive* and *Active* transmission modes.

Functions and dialog boxes

Topics

Main menu; Functions and dialog boxes

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the EK80. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.



How to open

By default, the **Main** menu is open. It is placed on the right side of the EK80 presentation.

Topics

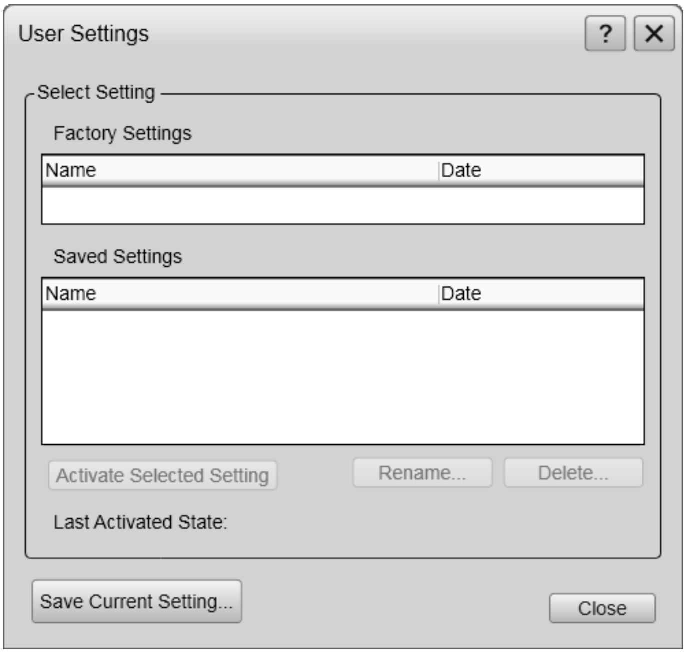
User Settings dialog box

The **User Settings** dialog box allows you to save the current user settings (your current selection of operational parameters), and to retrieve factory or previously saved user settings.

How to open

This dialog box is opened from the **Main** menu.

Description



The **User Settings** dialog box is used to store your favourite EK80 settings.

These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the EK80 user interface are saved.

Details

Factory Settings

Sometimes it may be useful to reset the EK80 to work with a set of known user settings. A set of "factory settings" is provided for this purpose.

These settings are the default values provided with the Simrad EK80. The settings may be put to use if you are uncertain of which values to use. They offer "best practice" settings for typical use. When you wish to apply the factory settings, a small dialog box will appear to request confirmation.

The factory settings cannot be altered.

Note

Unless they are saved, all your current settings are lost when the factory settings are applied.

Saved Settings

"Saved settings" are those created and saved by you and other EK80 users.

Each setting is identified by its name, as well as the time and date it was created. These settings may be deleted or renamed. You can save an unlimited number of profile settings, only limited by the size of the hard disk on your Processor Unit.

Activate Selected Setting

User settings that either you or any of your colleagues have saved can easily be retrieved and put to use. This shortens down the time it takes to get started with the EK80.

To activate either a factory or a saved setting, click the relevant name in one of the lists, then click the **Activate Selected Setting** button.

Rename

Use this function to rename one of your saved settings. To rename a user setting, select its name in the list, and then select **Rename**. A small dialog box opens to accept the new name.

Note

The factory settings can not be renamed.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

Delete

When you save the user settings, the files you have created are shown on the **Saved Settings** list. The list may be too long. User settings that you do not need can be deleted.

Use this function to delete one of your saved settings. To delete a user setting, select its name in the list, and then select **Delete**. A small dialog box opens so that you can verify your choice.

Note

The factory settings can not be deleted.

Save Current Setting

When you have spent some time working with the EK80, you are probably using specific settings that you know are efficient for your purpose. It is a good idea to save these settings.

Use this function to save the currently applied EK80 settings. To save the settings you are using, select the **Save Current Setting** button. A small dialog opens to accept the name of the new setting.

You can only add settings to the **Saved Settings** list.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

Related tasks

Saving, retrieving and handling user settings, page 252

Range function

The **Range** setting defines how "far" you wish the EK80 to detect echoes. In other words, you specify the horizontal or vertical distance from the vessel to the outer edge of the search area. With a transducer pointing straight down, the range is defined from a selected start range, and down to a value beneath the current bottom depth.

How to open

This function is opened from the **Main** menu.

Description

The **Range** setting defines how "deep" you wish the EK80 to detect echoes. In other words, this is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies the "bottom" depth, while the **Start Range** setting specifies the "top" depth.

The range you specify applies to the currently selected echogram. It is identified with a thick border. Several echogram types are available.

Tip

If you wish to apply the new range setting to all the current echograms of the same type, select **Apply to all**.

To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** *dialog box.*

You can only type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, select a predefined value. You can also adjust the setting by clicking the [+] and [−] buttons.

Example

Start Range in a surface-related echogram

In a surface echogram, set the **Start Range** value to 0 metres. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 metres. The echogram will now show the area from the sea surface and down to 20 metres "below" the sea bottom. The sea bottom contour is easily detected when the depth changes.

Example

<u>**Start Range** and **Range** in bottom-related echogram</u>

In a bottom echogram, set the **Start Range** value to –5 metres. This will make the echogram start from 5 metres above the sea bottom. Set **Range** to the 5 metres plus 10 = 15 metres. The echogram will now show the area from 5 metres above the depth, and down to 10 meters "below" the sea bottom. The sea bottom contour will appear as a flat line.

Details

Range

This setting controls the displayed depth range in the echograms. The start (upper) depth of the echogram is the value defined by the **Start Range** setting.

Select either side of the button to choose a value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

Auto

By selecting **Auto**, the EK80 automatically adjusts the range according to the current depth.

Apply to All

The value selected and shown is by default only applied to your active echogram. If you wish to apply the new range setting to all the current echograms of the same type, select **Apply to all**.

Related tasks

Controlling the gain and range settings, page 116

Conceptual descriptions

Observation range versus operational frequency, page 766

About bottom echoes, page 768

Start Range function

The **Start Range** function allows you to specify the start depth of the echogram. The value defines from which depth in the water column the presentation shall start. The depth value shown and selected is by default only applied to the currently selected echogram.

How to open

This function is opened from the **Main** menu.

Description

You use **Start Range** to define the minimum depth of the displayed targets. In other words, this is the depth of the "top" of the echogram. The **Range** setting specifies the "bottom" depth, while the **Start Range** setting specifies the "top" depth.

The start range you specify applies to the currently selected echogram. It is identified with a thick border. Several echogram types are available.

Tip

If you wish to apply the new start range setting to all the current echograms of the same type, select **Apply to all**.

To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** *dialog box.*

You can only type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, select a predefined value. You can also adjust the setting by clicking the [+] and [−] buttons.

Example

Start Range in a surface-related echogram

In a surface echogram, set the **Start Range** value to 0 metres. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 metres. The echogram will now show the area from the sea surface and down to 20 metres "below" the sea bottom. The sea bottom contour is easily detected when the depth changes.

Example

Start Range in a pelagic echogram

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

Example

Start Range and **Range** in bottom-related echogram

In a bottom echogram, set the **Start Range** value to –5 metres. This will make the echogram start from 5 metres above the sea bottom. Set **Range** to the 5 metres plus 10 = 15 metres. The echogram will now show the area from 5 metres above the depth, and down to 10 meters "below" the sea bottom. The sea bottom contour will appear as a flat line.

Details

Start Range

This setting controls the upper start depth for the echogram. The vertical height of the echogram is the value defined by the **Range** setting.

Select either side of the button to choose a value. Select the middle of the button to open it.

Apply to All

The depth value shown and selected is by default only applied to the currently selected echogram. If you wish to apply the new start range setting to all the current echograms of the same type, select **Apply to all**.

Related tasks

Controlling the gain and range settings, page 116

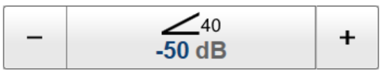
Conceptual descriptions

Observation range versus operational frequency, page 766

About bottom echoes, page 768

Minimum Level function

The purpose of the **Minimum Level** function is to adjust the echo sensitivity in the EK80 presentations. It controls how weak or strong an echo needs to be to be shown in the echograms. The setting is by default only applied to currently selected echogram. It is identified with a thick border. There are two minimum level buttons, one for each TVG setting (*20 log R* and *40 log R*).

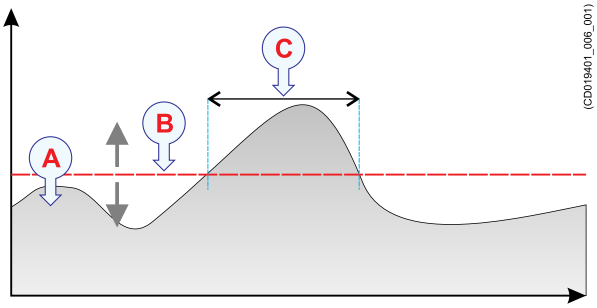


How to open

This function is opened from the **Main** menu.

Description

There are two minimum level buttons, one for each TVG setting (*20 log R* and *40 log R*). Each of these will only work on echograms with the same TVG setting.



The echo strength (A) changes with time. The Minimum Level (B) is adjusted up or down. Reducing the Minimum Level setting will increase the sensitivity. Only echoes over the Minimum Level will be shown (C).

Tip

You may wish to adjust the minimum level on all the echograms of the same type. To do this, select the middle of the button to open it, and then select **Apply to all***.*

To select which echogram types you wish to see in the EK80 presentations, use the **Echogram** *dialog box.*

You can also adjust minimum level in the **Colour Scale** dialog box. The **Colour Scale** dialog box is opened from the *Depth* information pane.

Do not confuse this **Minimum Level** setting with the **TVG** (Time Varied Gain) setting.

Details

Minimum Level

This setting controls the minimum level applied to the currently selected ("active") echogram

Select either side of the button to choose a value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value. You can also change the value by selecting - and holding - the middle of the button, and move the cursor sideways. Drag the cursor sideways to increase or decrease the value. Release the mouse button when requested value is shown.

Apply to All

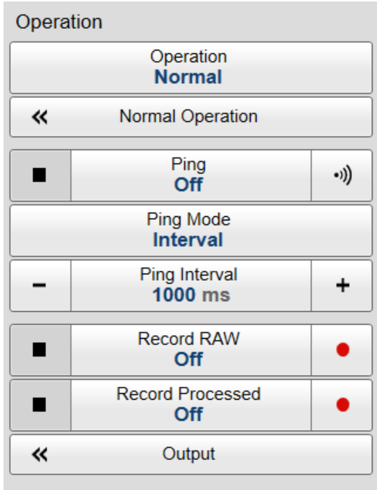
The setting is by default only applied to currently selected echogram. It is identified with a thick border. You may wish to adjust the minimum level on all the echograms of the same type. To do this, select the middle of the button to open it, and then select **Apply to all**.

Related tasks

Controlling the gain and range settings, page 116

Operation menu; Functions and dialog boxes

The **Operation** menu offers the most common functions for basic EK80 operation.



How to open

Select the **Operation** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.

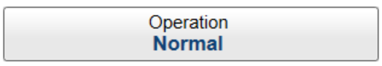
Note

Immediately after you have turned on the EK80, the **Operation** *icon is flashing. The icon is flashing to indicate that even if the EK80 is turned on, "pinging" is disabled.* **Ping** *is set to Off to prevent transmission ("pinging"). This is for safety reasons.*

Topics

Operation function

The **Operation** function controls the operating mode of the EK80. You can set it to *Normal*, *Replay* or *Inactive*. To activate *Mission* mode a mission plan must have been created previously.



How to open

This function is opened from the **Operation** menu.

Description

The EK80 offers several operating modes.

- *Inactive* mode is provided to pause the EK80 operation temporarily.
- *Normal* mode allows the EK80 to transmit ("ping") through the water, and to receive the echoes.
- *Replay* mode allows you to play back previously recorded data.
- *Mission* mode starts operation based on a predefined mission plan.

Select the middle of the button to open a small menu with the available options.

Tip

When you set the EK80 to Replay mode, select the **Replay File** *button. The* **Replay File** *dialog box allows you to choose which file(s) to play back. To control the actual playback, use the replay bar. The replay bar opens automatically at the top of the EK80 presentation when you choose Replay mode.*

Note that *Inactive* operating mode is not the same as *Passive* mode. While *Inactive* mode stops both transmission and reception, *Passive* mode will still allow the EK80 to receive echoes. If you wish to switch to *Passive* mode, use the **Normal Operation** dialog box.

The current operating mode is also shown in the **Extras** menu.

Details

Inactive

Select this option to disable the EK80 operation. Neither transmission nor reception will take place. When the EK80 has been disabled using this function, it will stop. The current echoes will be removed from the presentation. *Inactive* mode is a prerequisite for some of the options in the **Setup** menu.

Normal

Select this option to start normal operation. The EK80 will now transmit ("ping"), and then receive the echoes. The information is processed in the Processor Unit, and the resulting data are shown in the EK80 presentation.

The EK80 will transmit according to the currently selected "ping" parameters.

Note

The EK80 will transmit ("ping") only if **Ping** *is set to On.*

If you wish to establish a passive system (transmission switched off, but normal reception), use the function offered by the **Normal Operation** dialog box.

Replay

This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.

Do not confuse **Record** with the automatic **History** functionality. The *History* function saves the echogram images automatically on the Processor Unit hard disk These images can be recalled using the *History* information pane. The number of history files is limited. After reaching the maximum number of files, the latest echogram picture overwrites the oldest one. **Record RAW** allows you to record unprocessed raw echo data. Echo data files may be kept for future references. The amount of data you can record is only limited by the size of your storage media.

Tip

The **Replay File** *dialog box allows you to choose the echo data file(s) you wish to play back.*

Record RAW *allows you to record the unprocessed echo data received by the transducer.*

Mission

Mission mode starts operation based on a predefined mission plan. The *Mission* mode is only available if one or more mission plans have been defined, and one of these has been selected using **Select Mission**.

In this context, the phrase *mission* is used to describe an assignment, or a task, to be done by the EK80. The mission is normally done in *unattended* mode, in which the EK80 acts according to a predefined *mission plan*.

Related tasks

Getting started, page 93

Choosing operating mode and key transmit parameters, page 105

Recording and replaying raw echo data, page 127

Related functions

Ping function, page 579

Ping Mode function, page 580

Ping Interval function, page 581

Record RAW function, page 582

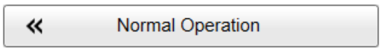
Record Processed function, page 584

Related dialog boxes

Replay File dialog box, page 747

Normal Operation dialog box

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It also allows you to change these parameters to match your current operating requirements.

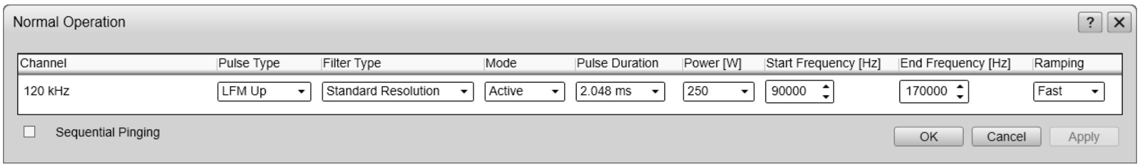


Prerequisites

The **Normal Operation** dialog box is only available when the EK80 operates in *Normal* mode.

How to open

This dialog box is opened from the **Operation** menu.



Description

The **Normal Operation** dialog box lists all the transmission parameters. The dialog box provides one row for each channel in use. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. You can change the parameters.

If you use a transceiver with multiplexing functionality, the **Normal Operation** dialog box presents each multiplexed channel separately. Some of the parameters can be chosen individually for each multiplexed channel, other parameters must be common.

Note

The settings in the **Normal Operation** *dialog box are limited by the specifications in the transducer setup file. Therefore, you cannot make any changes that will damage your transceiver or transducer. Certain settings may be limited by your license.*

Do not to make any changes unless you are well aware of the consequences.

If you wish to investigate the ambient noise, choose *Passive* mode in the **Normal Operation** dialog box. Any noise or disturbance in the water - within the transducer's frequency range - will then be detected and shown. This feature will for example be able to pick up disturbances from other hydroacoustic systems on your own vessel, or on other vessels in the vicinity.

The EK80 supports wideband transmissions using frequency sweeps. This is often referred to as "chirp", and means that the transmission frequency changes from a "start" frequency to an "end" frequency within the transmission. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Some of the information provided in the **Extras** menu reflects the settings in the **Normal Operation** dialog box.

Note

Some of the settings are specific for echo sounder or ADCP operation. The following ADCP systems are currently supported:

- *Simrad EC150-3C*

  The EC150-3C is a dual purpose unit. It can be used either as an acoustic Doppler current profiler (ADCP) instrument to measure water current or as a split-beam echo sounder. It can not operate these two functions simultaneously.

Details

Channel

This column identifies the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. The text string provides the following information:

- Transducer name
- Transducer serial number

If you use a transceiver with multiplexing functionality, the **Normal Operation** dialog box presents each multiplexed channel separately. Some of the parameters can be chosen individually for each multiplexed channel, other parameters must be common.

Pulse Type

The **Pulse Type** function allows you to select the "shape" of the transmitted pulses ("pings").

- CW
- LFM

The abbreviation "CW" means "Continuous Wave". "LFM" means "Linear Frequency Modulated".

In *LFM Down* the transmitted pulse starts using the upper frequency in the range, and ends with the lower frequency. The frequency sweep is linear. In *LFM Up* the transmitted pulse starts using the lower frequency in the range, and ends with the upper frequency.

Note

In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Only the Wide Band Transceiver (WBT) supports LFM Down. Your WBT must be fitted with the latest software version.

You can only use *LFM Down* and *LFM Up* on one channel on each transceiver. Any attempt to try these modes on more than one channel will result in an error message.

Filter Type

A dedicated receive filter is available. This filter setting is only available for LFM pulses.

- **Standard Resolution**: This filter setting applies the same bandpass filters and decimations as for the previous EK80 software versions.
- **Short**: This filter setting applies short bandpass filters and the lowest possible decimation. This setting will generally result in a shorter impulse response and higher output sample rate. These resulting echo data can be used to address range sidelobe issues from the bandpass filters while examining targets near boundaries. Note that the filter is wider in frequency, and may result in a reduced signal-to-noise ration.

Note

Unless you need the short resolution due to boundaries we suggest that you use the standard resolution. This setting reduces both the noise and the amount of data We recommend that you calibrate the EK80 with the **Filter Type** *setting that you will use during the survey.*

We regard the receive filter as "experimental" and invite you to review the results.

This functionality is not available for ADCP operation.

Mode

This column specifies the current transceiver mode. You can manually select the mode that suits your current operation.

The following modes are available:

- **Active**

  The transmitter and receiver are both active. This is the normal mode for operation.

- **Passive**

  In *Passive* mode, the EK80 will receive and compute the signals detected by the transducer(s). Therefore, this mode is useful for test purposes, and when you want to measure the ambient background noise in the sea. It can also be useful to run the EK80 in *Passive* mode to discriminate between target echoes (present only in *Active* mode) and noise (present in both *Active* and *Passive* modes).

- **Test**

  The transmitter is passive while the receiver is active. This mode is not designed for operational use with the EK80.

Pulse Duration

The **Pulse Duration** setting specifies the current duration ("length") of the transmitted pulse. You can manually select a pulse duration that suits your operation.

The pulse duration can be selected according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be selected. However, when using CW transmissions a long pulse duration will reduce the resolution. It will also cause the EK80 to transmit less frequent. Remember that in the EK80, the pulse duration and the bandwidth are mutually dependant.

For CW transmissions:

- Long pulses provides longer detection range. They make the EK80 less sensitive for noise, but offer lower range resolution.
- Short pulses provides shorter detection range. They make the EK80 more sensitive for noise, but offer higher range resolution.

For FM transmissions:

- Long pulses provide longer detection range, and the range resolution is independent of the pulse duration..
- Short pulses provide shorter detection range, and they make the EK80 more sensitive for noise.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Power

You are permitted to adjust the output power of the EK80. You can not increase the power to beyond the transducer’s capacity, but you may reduce it for better performance in shallow water, or if you are struggling with reverberation.

The **Power** parameter in the **Normal Operation** dialog box displays the transmitter's output power measured in Watts. You can change the output power manually. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest. For all practical purposes, this means that you can *reduce* the power output, but you can not increase it to beyond the power rating of the transducer.

The current setting of this parameter is also shown in the **Extras** menu.

Start/End Frequency

The **Start Frequency** and **End Frequency** parameters are used to set up a frequency sweep ("chirp"). If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wide band transmissions. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Note

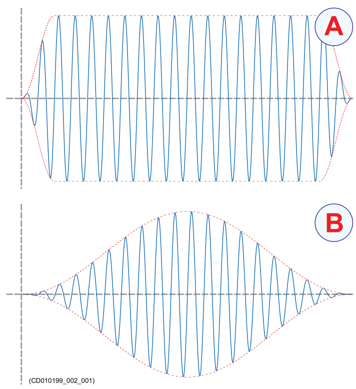
It is very important that the transducer you use complies to the frequencies you choose. The frequency range of each transducer is defined in the transducer setup file. If you choose a frequency range that is not supported, and error message will appear.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Ramping

The **Ramping** parameter provided in the **Normal Operation** dialog box defines how fast the output level of each transmission ("ping") shall increase from 0 V to maximum level. You have two options; *Fast* and *Slow*.



The principle is shown in the illustration. Curve (A) has **Ramping** set to *Fast*, and the level is increased from 0 V to maximum level using from minimum two (2) up to maximum ten (10) cycles. At the end of the pulse, maximum ten down to minimum two cycles are used to reduce the output level.

The number of cycles used depend on the q-factor (bandwidth relative to centre frequency) for the connected transducer. The number of ramping cycles will be upward limited to the number of cycles in half a pulse length.

Curve (B) has **Ramping** set to *Slow*. The output level is increased from 0 V to maximum level using the first half the pulse duration. The second half of the pulse is then used to reduce the output level.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Sequential pinging

The **Sequential pinging** function can be used if you have more than one channel in use on the EK80. When activated, each individual transceiver will transmit ("ping") in sequence, one by one. When not activated, all transceivers will "ping" simultaneously.

If two transducers are used on a transceiver, these will also "ping" simultaneously.

Tip

The **Sequential pinging** *function can be very useful if your transducers are located in such a manner that interference is a problem.*

The current setting of this parameter is also shown in the **BITE** (Built-In Test Equipment) dialog box. You open the **BITE** dialog box from the **Setup** menu.

This functionality is not available for ADCP operation.

Max(imum) Current Speed

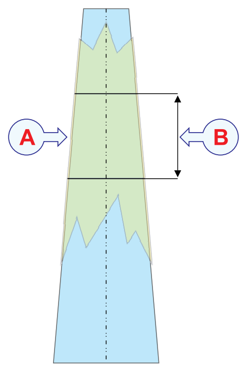
Maximum Current Speed controls the pulse duration and the processing functionality for ADCP operation. You do not need to make frequent changes to this setting. Select a value based on the expected water currents in your survey area. If you are uncertain, choose a value *above* the expected water current, and reduce it based on experience. The value you choose must always be equal or larger than the expected value.

Note

The measurement accuracy is reduced if the value is set much too large.

This functionality is only available for ADCP operation.

Depth Cell Size



A *Depth cell*

B *Depth cell size*

In water current measurements, the phrase *cell* is used to describe a *depth cell* (sometimes referred to as *bins*). These are uniform segments used by the acoustic Doppler current profiler (ADCP) to measure the velocity of the current.

The acoustic Doppler current profiler (ADCP) measures the speed and direction of the water current by means of acoustic pulses. These pulses have duration decided by the current size of the *depth cell*. Each beam can be seen as a number of depth cells evenly placed from the transducer surface and down to the lower end of the acoustic beam.

- Use smaller depth cells in shallower waters.

- Use larger depth cells in deeper waters.

A small depth cell offers better range resolution. This makes it is easier to detect minor depth variations in the current velocity. On deeper waters, a small depth cell will gradually suffer from more and more noise. The ping rate will also be reduced due to the high amount of processing that is required. A larger depth cell tolerates more noise. For this reason, larger depth cells must be used to measure velocity in deep waters.

This functionality is only available for ADCP operation.

Related tasks

Getting started, page 93

Adjusting the transceiver parameters, page 257

Related dialog boxes

Processor page, page 713

Transceiver page, page 716

Related topics

Extras menu, page 554

About ramping, page 763

Acoustic Doppler current profiler, page 779

Select Mission function

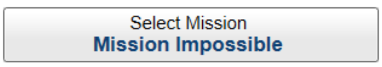
The **Select Mission** function enables you to select a predefined mission plan. Once you have defined one or more mission plans, one of these can be selected for recording data.

Prerequisites

Select Mission is only visible on the menu if a mission plan exists.

How to open

This function is opened from the **Operation** menu.



Description

Click on **Select Mission** and any mission created will be listed. The options reflect the mission plans you have defined.

Tip

To create and maintain mission plans, use the **Mission Planner** *dialog box. This dialog box is opened from the* **Setup** *menu.*

Ping function

The purpose of the **Ping** function is to enable or disable the EK80 transmissions into the water. Such transmissions are often referred to as "pinging".

Prerequisites

The **Ping** function is only available when the EK80 operates in *Normal* mode.

How to open

This function is opened from the **Operation** menu.

Description

The transmission ("pinging") from the EK80 can be turned on or off. Select the middle of the button to see the choices, or either side to enable or disable transmission. The ping symbol on the right side of the button is also used to transmit single pings.

Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit.

Details

On

The EK80 "pings" (transmits) energy into the water. The ping mode if controlled by the **Ping Mode** and **Ping Interval** settings.

Off

The EK80 does not "ping". No transmissions take place. When **Ping** is set to *Off*, the EK80 stops with the current echogram shown.

Tip

If you wish to establish a passive system (transmission switched off, but normal reception), use the function offered by the **Normal Operation** *dialog box.*

If you wish to investigate the ambient noise, choose Passive mode in the **Normal Operation** *dialog box. Any noise or disturbance in the water - within the transducer's frequency range - will then be detected and shown. This feature will for example be able to pick up disturbances from other hydroacoustic systems on your own vessel, or on other vessels in the vicinity.*

Related tasks

Choosing operating mode and key transmit parameters, page 105

Related functions

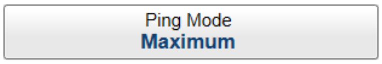
Operation function, page 569

Ping Mode function, page 580

Ping Interval function, page 581

Ping Mode function

Use **Ping Mode** to control how often the EK80 shall transmit its energy into the water. For scientific operations, choose *Interval*, and select a **Ping Interval** value according to the survey requirements.



Prerequisites

The **Ping Mode** function is only available when the EK80 operates in *Normal* mode.

How to open

This function is opened from the **Operation** menu.

Description

Once pinging is *On*, use **Ping Mode** to choose *how often* the EK80 shall transmit. Use it to control the *behaviour* of the transmissions (pinging).

- If you choose *Single Ping*, you can transmit single pings by selecting the ping symbol on the right side of the button.
- If you choose *Interval*, you must define the time between each ping with the **Ping Interval** function.
- If you choose *Maximum*, the EK80 will transmit (ping) continuously and as often as possible.

Note

For scientific operations, choose Interval, and select a **Ping Interval** *value according to the survey requirements.*

Details

Single Ping

This option allows the EK80 to transmit single pings. The EK80 transmits (pings) only when you select the symbol on the right side of the button.

Interval

The EK80 transmits (pings) with a fixed time interval. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping).

Maximum

The EK80 transmits (pings) as frequent as possible. The time between each ping (the *ping rate*) depends mainly on the current range. In some systems, a low performance Processor Unit and/or a slow hard disk may reduce the ping rate. How fast your Processor Unit communicates with external peripherals may also have an effect on the ping rate.

Related tasks

Choosing operating mode and key transmit parameters, page 105

Related functions

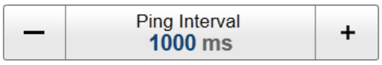
Operation function, page 569

Ping function, page 579

Ping Interval function, page 581

Ping Interval function

The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function permits you to choose the time (in milliseconds) between each transmission ("ping").



Prerequisites

The **Ping Interval** function is only available when the EK80 operates in *Normal* mode, and **Ping Mode** is set to *Interval*.

How to open

This function is opened from the **Operation** menu.

Description

Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission ("ping") when **Ping Mode** is set to *Interval*. You can choose any value from 10 ms and upwards.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.If you have a keyboard connected to the EK80, type the requested value.

Related tasks

Choosing operating mode and key transmit parameters, page 105

Related functions

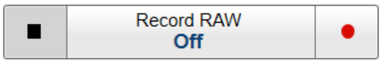
Operation function, page 569

Ping function, page 579

Ping Mode function, page 580

Record RAW function

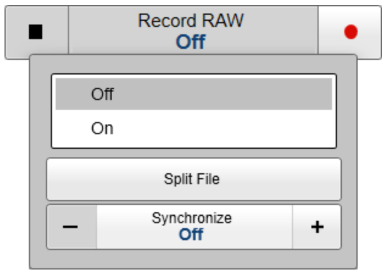
A key function of the EK80 is it ability to record echo data. **Record RAW** allows you to record the *unprocessed* echo data received by the transducer. You can save the data to the Processor Unit hard disk, or onto an external storage device. The data files can be played back on the EK80. You can keep the recorded files for scientific studies, future references or for training purposes.



How to open

This function is opened from the **Operation** menu.

Description



The raw data recording function provided by the EK80 allows you to save echo data using the `*.raw` format. By means of the *Replay* function you can later play back the recorded file(s) on the EK80. This may prove useful if more a detailed study of the data is requested. You can also use the file(s) to experiment with the EK80 operational settings, as this will help you to gain more experience. The amount of data you can record is only limited by the size of your storage media.

The **Record RAW** button allows you to start and stop recording, split the current recording file (if it gets too large), and set up the file output parameters. Once all the recording parameters have been defined, you can start recording by clicking the red circle on the button, and stop it by clicking the left rectangle.

Tip

The **Output** *dialog box on the* **Operation** *menu allows you to set up the recording parameters. To define which disks and folders to use to save the data files, select* **File Setup**.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

To change the file and folder parameters, open the **Output** dialog box on the **Operation** menu, and select **File Setup**.

On the EK80, you can save and recall echo information using the following methods and formats.

- Bitmap images (containing the full EK80 screen capture) are saved whenever you select **Screen Capture** on the top bar. Each screen capture you make is saved in `.jpg` format on the Processor Unit hard disk. The **Screen Captures** tab on the bottom bar opens a dedicated viewer that allows you to open these images. In the viewer you can also open the file folder on the Processor Unit hard disk. You can copy, rename or delete the image files.
- Use **Record RAW** on the **Operation** menu to record raw data. To play back data, use **Operation** to select *Replay* mode.This mode allows you to replay previously recorded data on the EK80. When in *Replay* mode, the EK80 is not able to transmit ("ping"). For this reason, the EK80 is inactive during playback.
- A "history file" is recorded automatically and continuously. When the file is full it will start to overwrite the oldest data, thus creating a "ring buffer". These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. To open the *History* information pane, select the button on the top bar.
- Use **Record Processed** on the **Operation** menu to record processed data. This is only an export format. Processed data files can not be played back on the EK80.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Ways to start and stop recording

On the EK80, you can start and stop data recording in several ways.

a On the **Operation** menu, select the red circle in the **Record** button to start recording. Select the black rectangle to stop recording.

b Select the middle of the **Record** button to open it, and select *On* or *Off*.

The **Record** indicator on the top bar will switch to red colour when recording is active.

Details

On/Off

You can use the **Record RAW** button menu to start and stop recording. Click the middle of the button to open it, and select *On* or *Off*. For faster control, use the right and left side of the **Record RAW** button. To start recording, click the red circle on the right side. To stop recording, click the black rectangle on the left side.

Note

Set up the recording parameters before you start the recording. **File Setup** *controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. The* **File Setup** *page is located in the* **Output** *dialog box.*

Split File

During recording, you can click this command at regular intervals. Every time you do so, the current recording file will be terminated, and a new file will be started. In this way you can manually control the size of each recorded file.

Synchronize

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously. To synchronize the recording functions, select **Synchronize** and set it to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Related tasks

Recording and replaying raw echo data, page 127

Related functions

Record indicator description, page 451

Operation function, page 569

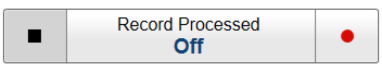
Record Processed function, page 584

Related dialog boxes

Replay File dialog box, page 747

Record Processed function

The **Record Processed** function allows you to record the *processed* echo data received by the transducer. Which processing to apply is controlled by the **Processed Data Output** settings in the **Output** dialog box.



How to open

This function is opened from the **Operation** menu.

Description

You can set up the EK80to record the processed echogram information on the internal hard disk, or other recordable media. These files may be kept for future references.

The **Record Processed** button allows you to start and stop recording, split the current recording file (if it gets too large), and set up the file output parameters. Once all the recording parameters have been defined, you can start recording by clicking the red circle on the button, and stop it by clicking the left rectangle.

Tip

The **Output** *dialog box on the* **Operation** *menu allows you to set up the recording parameters. To define which disks and folders to use to save the data files, select* **File Setup**. *To choose which processed data formats to record, select* **Processed Data Output**.

On the EK80 you can record both RAW and processed data using the **Record RAW** and **Record Processed** functions. It may be useful to synchronize these two functions to automatically record all data formats simultaneously.

To synchronize the recording functions, open the **Record RAW** button, and set **Synchronize** to *On*. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Details

On/Off

You can use the **Record Processed** button menu to start and stop recording. Click the middle of the button to open it, and select *On* or *Off*.

For faster control, use the right and left side of the **Record Processed** button. To start recording, select the red circle on the right side. To stop recording, select the black rectangle on the left side.

Related tasks

Recording and exporting processed echo data, page 137

Related functions

Record RAW function, page 582

Related dialog boxes

Output dialog box, page 586

Output dialog box

A key function of the EK80 is its ability to export data. The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location. The pages in the **Output** dialog box are described in a separate structure.

Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This dialog box is opened from the **Operation** menu. The **I/O Setup** page can also be opened from the **Installation** dialog box. The **Installation** dialog box is located on the **Setup** menu.

Description

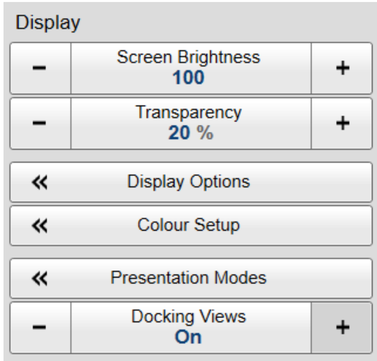
This dialog box contains a number of pages selected from the menu on the left side.

Related topics

File Setup page, page 632
I/O Setup page, page 636
Processed Data to Output page, page 640
Processed Data to File page, page 642
Relay Output page, page 645

Display menu; Functions and dialog boxes

The **Display** menu provides basic functions related to the screen behaviour and presentation of EK80 data.



How to open

Select the **Display** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Topics

Screen Brightness function, page 587

Transparency function, page 588

Display Options dialog box, page 589

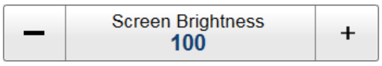
Colour Setup dialog box, page 589

Presentation Modes dialog box, page 591

Docking Views function, page 593

Screen Brightness function

The intensity of the light given off by the EK80 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light.



How to open

This function is activated on the **Display** menu.

Description

When the bridge is dark, the light emitted by the EK80 display can affect your night vision. In order to compensate for this, you can reduce the intensity The **Screen Brightness** function allows you to reduce the brightness, and hence make the presentation darker. The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

Note

If you wish to adjust the colour intensity and/or colour scheme of the EK80 presentation, you can also try the **Palette** *function in the* **Colour Setup** *dialog box.*

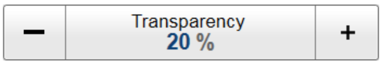
To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it. If you have a keyboard connected to the EK80, type the requested value.

Related tasks

Defining settings related to user preferences and individual customizing, page 245

Transparency function

When you open an information pane, you will see that it is transparent. This transparency allows you to see the echograms data behind the pane, but it may also reduce the visibility of the information in it. The transparency can be adjusted.



How to open

This function is activated on the **Display** menu.

Description

The information panes provided by the EK80 can be placed anywhere on top of the views in the presentation.

In order not to loose information, the panes have been designed so you can see through them. The degree of transparency can be controlled with this **Transparency** function. You can adjust the setting from 0% (no transparency) to 90% (almost full transparency) in steps of 10%.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.If you have a keyboard connected to the EK80, type the requested value.

Related tasks

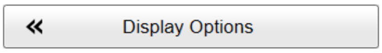
Defining settings related to user preferences and individual customizing, page 245

Related topics

Information panes, page 462

Display Options dialog box

The **Display Options** dialog box is used to specify the basic settings for the EK80 presentation. The pages in the **Display Options** dialog box are described in a separated structure.



How to open

This dialog box is opened from the **Display** menu.

Description

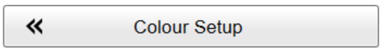
This dialog box contains a number of pages selected from the menu on the left side. The choices you make in the **Display Options** dialog box have no effect on the overall performance of the EK80.

Note

The information shown on the EK80 top bar must not be used for vessel navigation.

Colour Setup dialog box

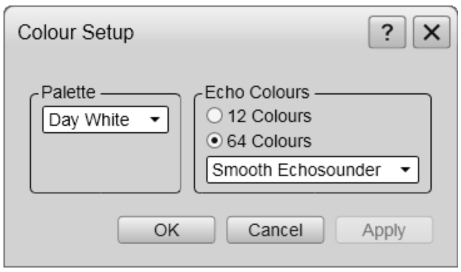
The **Colour Setup** dialog box controls the presentation colours used by the EK80. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation



How to open

This dialog box is opened from the **Display** menu.

Description



The settings in the **Colour Setup** dialog box are organized in two groups.

- The **Palette** function is used to select the overall colour theme ("skin") used in the EK80 presentation.
- Under **Echo Colours**, choose how many colours you wish to use in the presentations, and which colour scale. The chosen colours are shown at the bottom of the EK80 presentation.

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

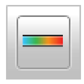
Tip

By default you have 64 or 12 colours available to present the echoes, and a selection of palettes. The colour scale can be retrieved any time by selecting **Colour Scale** *on the top bar. The chosen colours are shown at the bottom of the EK80 presentation.*

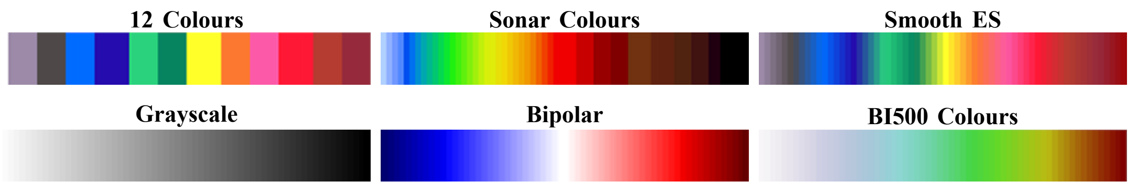
If you choose to use many colours, the resolution of the EK80 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Tip

You can adjust the echo level range by means of the **Colour Scale** *settings. These are opened from the Colour Scale information pane. You can find the same settings in the* **Information Pane Options** *dialog box on the* **Active** *menu.*



The following colour scales are available:



The **Smooth Echosounder** scale is based on the standard 12-colour scale. Additional colours have been added between them to make smoother colour transitions. The **Bipolar** scale is mainly intended for ADCP views.

Details

Palette

Select a palette to suit the ambient light conditions and your personal preferences. The choice you make does not have any effect on the EK80 performance. The following options are available:

- **Day Black**: intended for use on the bridge during dusk and dawn.
- **Day White**: intended for daytime use on the bridge.
- **Night**: intended for night-time use on the bridge.

Echo Colours

Set the number of colours to use in the EK80 presentations; 12 or 64.

Note

The additional colour scale can only be used if you choose 64 colours.

Colour Scale

When 64 colours are selected, you can select the desired colour scale to be used on the EK80 presentations.

Related tasks

Setting up the echogram presentation, page 151

Defining settings related to user preferences and individual customizing, page 245

Related dialog boxes

Information Pane Options dialog box, page 628

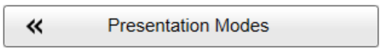
Colour Scale page, page 724

Related information panes

Colour Scale information pane description, page 464

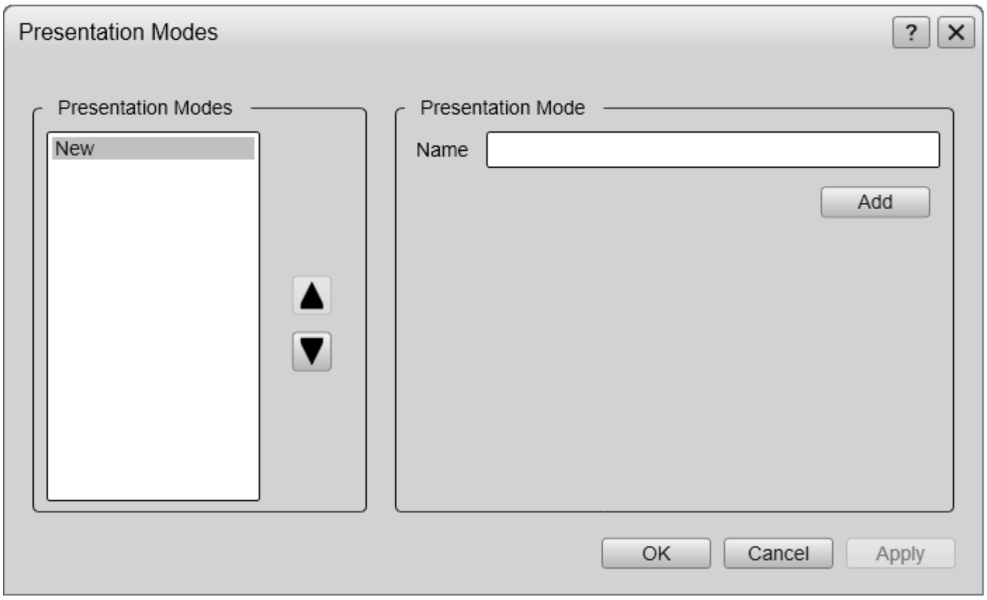
Presentation Modes dialog box

The EK80 supports several different echogram types. Each echogram is shown in a separate view in the EK80 presentation. The tabs at the bottom of the EK80 presentation allows you to choose which channels to open. By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.



How to open

The dialog box is opened from the menu provided by the **Docking Views** button. This function is opened from the **Display** menu.



Description

The views are organized in *presentation modes*. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation.

> The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

The **Presentation Modes** dialog box allows you to change the order of the tabs at the bottom of the EK80 presentation. You can create a new tab to contain the view(s) of your choice. You can delete tab(s) that you do not use. You are not permitted to delete the default system tabs.

Tip

To add one or more views to a new presentation mode, use **Add Window**.

Details

Presentation Modes

The **Presentation Modes** box lists the current presentation modes. Each of these appears as a tab on the bottom bar.

Select a mode in the list.

- Select any of the two arrows to position the tab at the bottom of the EK80 presentation.
- Select **Remove** to delete it.

Presentation Mode

In the **Presentation Modes** box, select **New**. Type a name for the new mode. Select **Add**.

Select a mode in the list. Select **Remove** to delete it.

Return to...

Docking Views function, page 593

Related tasks

Setting up presentation modes and views, page 238

Related dialog boxes

Add Window dialog box, page 749

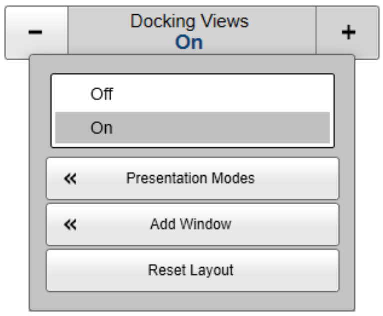
Docking Views function

The echograms take up the largest part of the EK80 presentation. The information from each channel is shown in a separate view. The **Docking Views** function provided by the EK80 allows you to rearrange the physical positions of the views, and change their sizes.

How to open

This function is opened from the **Display** menu.

Description



Once the **Docking Views** function is activated, the EK80 views are placed in named windows, and docking positions are shown. The docking positions show you where to drag and drop the selected view. Any view can selected, and then repositioned as indicated by the docking positions.

When a complete reorganisation of the view positions and sizes have been completed , you may wish to restore the EK80 presentation to what it was *before* you changed it. The **Reset layout** function restores all the views to their default positions.

Tip

You can use the **User Settings** *dialog box and functions to switch between your favourite view settings.*

Details

On

Select **On** to activate the function.

Off

Select **Off** to deactivate the function.

Add Window

Modern computers can easily feed more than one display.

The **Add Window** dialog box makes it possible to create a new window for a dedicated echogram presentation. The new window can contain a copy of an existing echogram channel, or it can be used to present a channel that is currently not visible.

The window can for example be placed on a second (or third) display connected to your Processor Unit.

Select **Add Window** to open the dialog box. Select which channel to place in the new window.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Presentation Modes

The views are organized in *presentation modes*. Which presentation mode to use is selected with the tabs at the bottom of the EK80 presentation.

> The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

By means of the **Presentation Modes** dialog box you can change the order of these tabs, and you can add your own tabs.

To add one or more views to a new presentation mode, use **Add Window**.

Related tasks

Setting up presentation modes and views, page 238

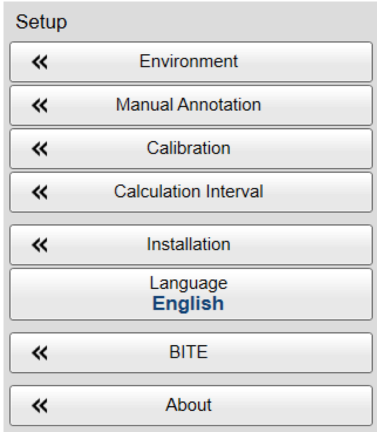
Related dialog boxes

Presentation Modes dialog box, page 591

Presentation Modes dialog box, page 591

Setup menu; Functions and dialog boxes

The **Setup** menu provides basic functions related to the EK80 installation parameters and its communication with peripheral systems.



How to open

Select the **Setup** icon.

The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Topics

Environment dialog box

Environmental parameters such as salinity, sound speed and water temperature all play an important part to present accurate echo data. Use the **Environment** parameters to define these values. Depending on the current sea and weather conditions, you may need to change these values frequently.

How to open

This dialog box is opened from the **Setup** menu.

Description

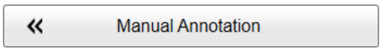
In order to obtain accurate depth readings and fish echoes, it is very important that the sound speed through the water is set correctly. Several parameters are required to calculate the correct sound speed value. If these parameters are not known to you, use the default value 1494 m/s. This is a typical mean value for sound speed in salt water. In fresh water we suggest that you set the sound speed value to 1450 m/s.

Related topics

Water Column page, page 653
Transducer Face page, page 656
Profile page, page 658

Manual Annotation dialog box

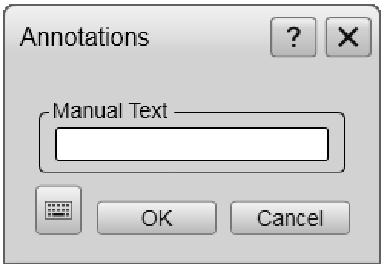
Sometimes it can be useful to place a single written comment on the echogram. The **Manual Annotation** dialog box offers that function. Type a text string. Select **OK** in the dialog box to add the text to your echogram.



How to open

This dialog box is opened from the **Setup** menu.

Description



Type any text into the box. The size of the box will adjust to the length of your text.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

The dialog box may be opened during replay, but you will not be able to place text annotations on a pre-recorded echogram.

Tip

Several different annotation types may be added to the echograms or other views. Annotations can only be added to views while in Normal operational mode. Use the **Annotations** *page to type comments and insert annotations into views. The* **Annotations** *page is located in the* **Installation** *dialog box.*

The **Event** *button is used to initiate an event annotation on the echogram.*

Related tasks

Setting up the echogram presentation, page 151

Setting up the ADCP presentation, page 212

Related topics

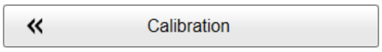
Event button description, page 452

Related dialog boxes

Annotations page, page 702

Calibration function

The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.



Prerequisites

Calibration can only be started with the EK80 in either *Normal* or *Replay* mode.

How to open

This function is opened from the **Setup** menu.

Description

The EK80 echo sounder system is used for either target strength measurements or velocity measurements. Calibration is provided for both purposes, using entirely different methods of calibration. The **Calibration Wizard** will guide you through the steps according to what type of calibration you select.

In order to calibrate the EK80, a reference target (calibration sphere) with known target strength (TS) is lowered into the sound beam. The measured target strength is compared with the known target strength, and the EK80 is adjusted accordingly.

In this context, the transducer beam is conically shaped with a cross-section area increasing with the depth. The cross-section is divided into "slices", and each slice represents a sector in the transducer. A split-beam transducer has three or four sectors. The circular cross-section is therefore split into three 120-degree or four 90-degree slices.

To successfully calibrate the EK80 you need to place a number of target detections in each sector. The echoes must be distributed within the entire beam cross-section. In order to do this, the target sphere must be physically moved inside the beam during the calibration process. If the sphere location is constant, you will be rewarded with many echoes, but all will be inside the same sector. The number of sphere detections should be approximately the same for each sector, and in total not more than 100 for the whole beam cross-section.

Any adjustments to the EK80are done automatically by the calibration program. No gain adjustments are required.

Tip

Kongsberg Maritime can supply a variety of copper and tungsten calibration spheres dedicated for different operational frequencies. Each sphere diameter is selected for minimum temperature dependence.

Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Calibration for EK80 velocity measurements requires the use of a global positioning system (GPS) and an ADCP transducer. The calibration method involves collecting data from the GPS and ADCP transducer while traversing at set of courses forming a pattern resembling an "L". The vessel traverses a course of 400 to 800 meters at a constant compass heading and speed then a new course of the same length is traversed at a heading approximately 180 degrees from the previous pass. You must do this twice creating a total of four lines. Traversing the same distance in opposite directions helps to ensure that no directional bias is introduced.The data collected is used in the **Calibration Wizard** to calculate correction values for the ADCP velocity measurements.

The ratio of Speed Over Ground (SOG) from the GPS and SOG from the ADCP is used to correct the measurements from the ADCP. Average differences for pitch, roll and yaw are also used to correct the ADCP measurements.

Note

Velocity measurement calibration is always performed using replay data or reprocessing of calibration data. It is very important that you choose the correct channel for calibration as the calibration process differs greatly between velocity measurements and target strength measurements. The velocity measurement channels are by default named "ADCP".

Calibration Wizard

The **Calibration Wizard** offers a set of dialog boxes to guide you through the calibration process.

1 The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.

2 The second page in the **Calibration Wizard** allows you to select the channel to be calibrated.It is very important that you choose the correct channel for calibration as the calibration process differs greatly between velocity measurements and target strength measurements.

3 The third page, and the following pages, in the **Calibration Wizard** will be specific for the different calibration processes for velocity measurements and target strength measurements.

Note

When you calibrate the EK80 for target strength measurements with "live data", it is very important that you choose the correct channel, and that all the other channels are switched to Passive mode. You must do this before you start the calibration process. To select Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

Related tasks

Calibration procedures, page 376

Calibration procedures for velocity measurements, page 426

Related topics

Calibration for target strength measurements, page 371

Calibration for velocity measurements, page 422

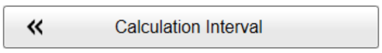
Related dialog boxes

Calibration functions and dialog boxes, page 394

Calibration functions and dialog boxes for velocity measurements, page 439

Calculation Interval dialog box

The **Calculation Interval** settings define the parameters that are used to calculate the biomass and the size distribution. You can base the calculations on sailed distance, elapsed time, or a number of pings.



How to open

The **Calculation Interval** parameters can accessed from two places in the EK80 user interface.

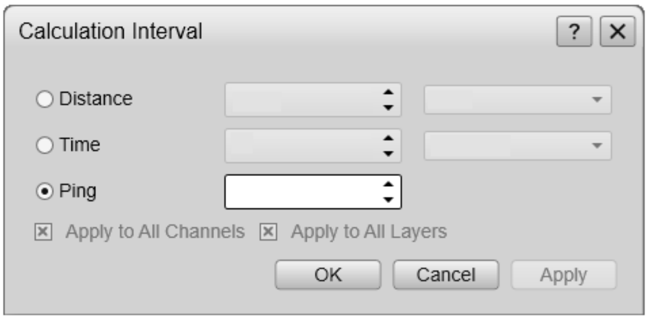
- The page is opened in the **Information Pane Options** dialog box.
- The dialog box is opened using the **Calculation Interval** button on the **Setup** menu.

The parameters are the same, it does not matter if you use the page or the dialog box.

Tip

To open the **Information Pane Options** *dialog box, select the button on the* **Active** *menu. You can also select the* **Setup** *button in the relevant information pane.*

Description



The biomass and size distribution values are calculated based on the echo data collected by the EK80. Use the **Calculation Interval** settings to limit the source data used by these calculations. You can base the calculations on data collected

- within a sailed distance
- within a given time frame
- from a defined number of pings

The settings for **Calculation Interval** do not have any effect the biomass line.

Details

Distance

Select **Distance** to allow the EK80 to make the calculations based on the echo data collected during a sailed distance.

Time

Select **Time** to make the calculations based on the echo data collected during the last elapsed seconds or minutes.

Ping

Select **Ping** to make the calculations based on the echo data collected during the latest number of Acoustic transmissions (pings).

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Apply to All Layers

Select this box to apply the current selection to all the depth layers you are using on the EK80. In this context, the phrase layer is used to describe the depth layers that may be defined for the EK80 echograms. Each layer is defined by its upper and lower depth limit.

Return to...

Information Pane Options dialog box, page 628

Related tasks

Changing the calculation parameters for the Biomass information pane, page 181

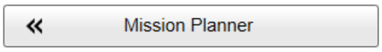
Changing the calculation parameters for the TS Histogram information pane, page 179

Mission Planner dialog box

The **Mission Planner** dialog box offers a planning and programming tool for compound EK80 operation.

How to open

This function is opened from the **Operation** menu.



Description

In the **Mission Planner** dialog box you can create, edit and remove mission plans and all elements included in mission plans.

Mission planning

A mission plan describes a pattern of transmissions ("pings") developed by you. The EK80 will perform transmission according to the mission plan. The execution of the mission plan can be stopped, paused, and restarted by the operator. To build this pattern the mission plan concept introduces a few terms.

- **Ping**

  A ping defines the properties of a transmission (ping) from a specific transducer. Each ping configuration is defined by a name at your choice as well as standard ping parameters such as transducer, frequency, power, pulse type and pulse duration. You create ping configurations in the **Ping** page of the **Mission Planner** dialog box. You can define multiple numbers of pings and combine these into ping groups for the specific transducer. To select a ping configuration in a mission plan you will need to include it in a ping group.

  Note

  Only transducers which are installed in the EK80 can be used for ping configuration.

- **Ping Group**

  A ping group is created from a collection of your ping configurations. A ping group defines the pings or transmissions which are transmitted simultaneously. In the Mission Planner dialog box you can create ping groups in the page called Ping Groups. Each ping group is identified by a name of your choice. To select a ping group in the mission plan it must be included in an ensemble.

  Note

  There can be only one ping configuration from a specific transducer in a ping group.

- **Ensemble**

  An ensemble is a collection of one or more ping groups. It allows you to have different types of pings in a series. The intention of an ensemble is to perform repeating sets of different configurations. The ensemble is identified with a name that you choose. By using multiple ensembles, you can create advanced operational patterns. Use the **Ensemble** page in the **Mission Planner** dialog box to create and modify ensembles.

- **Mission Plan**

  A mission plan describes a pattern of transmissions ("pings") developed by you. A mission plan consists of a set of ping configurations and information on how to execute the pings these configurations represent. The different ping configurations defined are gathered into ping groups. The ping groups can be executed repeatedly in what is named ensembles. The mission plan includes any number of ensembles and each ensemble may be repeated a fixed number of times.In the **Mission Plan** page of the **Mission Planner** dialog box you can create the mission plan.The mission plan is identified by a name of your choice.

Saving a mission results in a file containing information of all ping configurations, ping groups and ensembles and the iterations for each. You can edit the mission plan parameters by adding or removing ensembles or changing ping configuration or ping groups. The mission plan file can be uploaded in EK80 at any give time and activated.

Click on **Select Mission** and any mission created will be listed.

Note

A mission plan can be loaded only when the EK80 is in Mission operating mode.It is not possible to copy and share mission plans between different EK80 systems. EK80 parameter values included in the mission plan are specific for each EK80 installation.

Related topics

Ping page, page 660
Ping Group page, page 666
Ensemble page, page 668
Mission Plan page, page 669

Installation dialog box

Before you use the EK80 you must set it up to communicate with the relevant peripherals. This includes the transducer(s). Use the **Installation** dialog box to set up all interfaces with external devices, and to set up basic parameters related to installation and operation. In most cases, you only need to do this once. The pages in the **Installation** dialog box are described in a separate structure.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This dialog box is opened from the **Setup** menu. The **I/O Setup** page can also be opened from the **Output** dialog box.

Description

This dialog box contains a number of pages selected from the menu on the left side.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page. When you install something (sensors, transducers, etc.), you must first select what you want to install, then define the relevant parameters, and finally select* **Add**.

Related topics

Transducer Installation page, page 673
Transceiver pages, page 677
Transceiver Installation page, page 679
Transceiver IP Address page, page 686
I/O Setup page, page 636
Sensor Installation page, page 689
Sensor Configuration page, page 694
Synchronization page, page 696
Units page, page 699
Trawl page, page 701
Annotations page, page 702
Remote Control page, page 705
Remote Control: Application Information page, page 706
Remote Control: As Server page, page 707
Client Server Configuration page, page 708
Software License page, page 709

Language function

You may prefer to use the EK80 with a user interface in your own language. A selection of languages is provided. The **Language** function allows you to select the language to be used in the EK80 presentations, menus and dialog boxes.

How to open

This function is opened from the **Setup** menu.

Description

The text in the menu buttons on the EK80 can be provided in several different languages. Use the **Language** function to select the language you want to use. With a few exceptions, the chosen language will also be used for all other text on the EK80.

Note

The EK80 help may not be available for the language you choose.

Related tasks

Defining settings related to user preferences and individual customizing, page 245

BITE (Built-In Test Equipment) dialog box

The EK80 is a computerized Wide band scientific echo sounder. There are hardly any analogue circuitry, and the possibility of traditional troubleshooting is limited. In order to rectify this, a built-in software application is available to offer test and maintenance functionality. The **BITE** (Built-In Test Equipment) dialog box controls the test and diagnose program that checks the performance of the EK80.

How to open

This dialog box is opened from the **Setup** menu.

Description

By means of the **BITE** (Built-In Test Equipment) functionality, you can easily determine if the EK80 hardware is operational. And most important, you can make sure that all the transceivers channels and the transducer elements are functional. To open the different pages in the **BITE** (Built-In Test Equipment) dialog box, use the large "buttons" on the left hand side.

Each button provides a small colour coded indicator.

- **No indicator**: Status is OK. No actions are necessary.
- **Yellow**: This is a warning. A closer investigation is recommended.
- **Red**: This is an alarm. A closer investigation is required.
- **Grey**: No information is available.

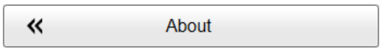
The **BITE** (Built-In Test Equipment) dialog box and functionality is only provided for performance monitoring. The functionality is not required for normal use of the EK80. The **BITE** dialog box does not permit you to change any operational parameters.

Related topics

Processor page, page 713
Sensors page, page 715
Transceiver page, page 716
Transducer page, page 718
Noise page, page 720

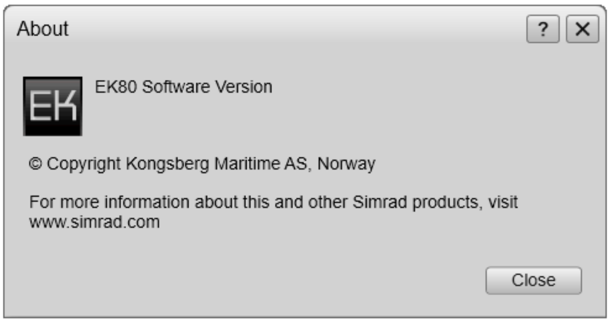
About dialog box

Every EK80 software release is uniquely identified. The **About** dialog box identifies the current EK80 software version. The version described in this Reference Manual is 2.0.0.



How to open

This dialog box is opened from the **Setup** menu.



Description

Every EK80 software release is uniquely identified. The **About** dialog box identifies the current EK80 software version with its release date.

If you wish to find the latest software version for the EK80, check our website.

Note

This information is also found in the **BITE** *(Built-In Test Equipment) dialog box. You open the* **BITE** *dialog box from the* **Setup** *menu.*

Related tasks

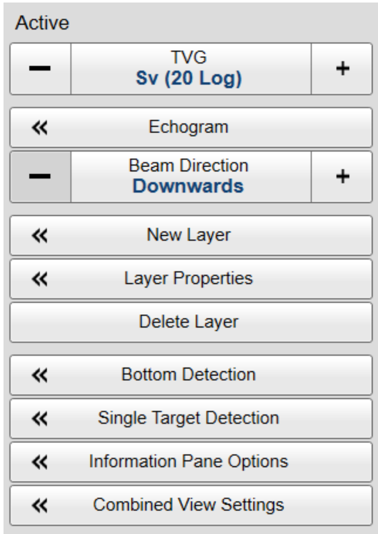
Installing and maintaining software, page 329

Related dialog boxes

Processor page, page 713

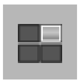
Active menu; Functions and dialog boxes

The **Active** menu offers parameters related to current views and data presentations shown by the EK80.



How to open

Select the **Active** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Context sensitivity

The choices in the this menu depends on which view in the EK80 presentation that is currently "active". The menu may therefore change from one view to another. The name of the currently active view is identified at the top of the menu. The screen capture may not show you all the menu choices.

Note

Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. *If you select* **Apply to All** *your setting is applied to all the views simultaneously.*

Topics

ADCP View Settings dialog box, page 629

ADCP Editing dialog box, page 630

ADCP Colour Span function

The **ADCP Colour Span** function enables you to adapt the span of colours to the range of the actual ADCP data being displayed. For instance if the maximum vessel velocity data will be in the span +2m/s to —2m/s you can set this as your maximum colour span. The ADCP view will then provide the best colour representation of the ADCP data with the best resolution of the data representation.

Prerequisites

This page is available only when ADCP is activated.

How to open

You open this function from the **Active** menu.

Description

The ADCP views provided by the EK80 display ADCP data using colours in all their velocity and speed views. These ADCP data are displayed using either a bipolar representation or a gradient one-colour representation. The colour and/or the saturation of a colour indicates the magnitude of the ADCP data. In order to have an optimum view which displays as many variations in velocity and/or speed the maximum values for the colour scale must harmonize with the highest magnitudes in the ADCP data being displayed. The maximum values representing the most saturated colours are set with this **ADCP Colour Span** function.

The ADCP colour span can be set individually for each of the velocity views. Select a view by clicking in it. Use **ADCP Colour Span** to set the range for this particular view.

Note

The ADCP colour span can be set individually for each of the velocity views.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.

Related tasks

Setting up the ADCP presentation, page 212

Exploring water velocities using ADCP, page 197

Related topics

Acoustic Doppler current profiler, page 779

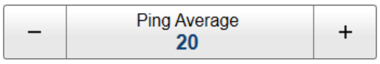
Related dialog boxes

ADCP View Settings dialog box, page 629

ADCP Editing dialog box, page 630

Ping Average function

The **Ping Average** function allows you to estimate ADCP data using a moving average of a subset of pings. Ping averaging reduces the impact of measurement errors and random noise. Use this function to select the subset size for the moving average.



How to open

You open this function from the **Active** menu.

Description

The ADCP transmits pings from each transducer element and the echoes arrive back at the instrument over an extended period. The ADCP velocities and data are estimated from data from an average of a subset of pings. It is recommended to average over several pings in order to reduce random noise. Random noise related to the single-ping measurement is typically too high to be used directly. The averaging operation reduces the ensemble noise of a a factor of approximately $\sqrt{N}$, N being the number of averaged pings.

To change the setting, move the cursor to either side of the button. Select the *left* side of the button to *decrease* the value. Select the *right* side of the button to *increase* the value. Select the middle of the button to open it.

Related tasks

Setting up the ADCP presentation, page 212

Related topics

Acoustic Doppler current profiler, page 779

Related dialog boxes

Pages in the ADCP View Settings dialog box, page 739

TVG (Time Variable Gain) function

TVG (Time Variable Gain) compensates for the loss of acoustic energy due to geometric spread and absorption. This makes the targets with the same strength appear with the same intensity independent of their physical distance from the transducer.

How to open

This function is opened from the **Active** menu.

Description

When a sound pulse is travelling from the transducer through the water it will undergo geometrical spreading. The sound intensity falls off with the range squared (**$1/r^2$** where r=range). The same applies to the echo from a target in the water column; sound intensity falls off with **$1/r^2$**. The total two-way spreading is therefore:

$1/r^2 \times 1/r^2 = 1/r^4$

To remove this effect, the received echo must be compensated according to **r^4**. In logarithmic terms this is **$10 \log r^4$** or **$40 \log r$**. This compensation applies to single targets.

When a school of fish covers the whole acoustic beam cross section, the received echo will increase with range simply because the acoustic beam cross section increases with range. The received echo increases according to **r^2**, where **r** is now the radius of the acoustic beam. This introduces an **r^2** into the-two way spreading (**r^2/r^4**) so that the school compensation becomes **r^2**, or in logarithmic terms **$20 \log r$**.

In addition to the geometrical spreading, sound energy is absorbed in water. Absorption is higher in salt than in fresh water and increases with the operating frequency. The received echo must also be compensated according to the absorption.

The combined compensation for the geometrical spreading and absorption is the TVG

Tip

You can select TVG using this function. You can also adjust the TVG setting in the **Echogram** *dialog box. The* **TVG** *function is located on the* **Echogram** *page.*

Details

TVG

Select the **TVG** setting you want to use. Several TVG compensation settings are available.

- **No TVG**: TVG compensation is not implemented. This option is hardly ever used.
- **Sv (20 Log)**: Volume backscattering strength
- **Sp (40 Log)**: Point backscattering strength

Note

The setting you choose will only be valid for the currently active echogram. The active echogram view is identified with a thicker border. Normally, you must first click in the chosen echogram to activate it, and then choose the setting you wish to use.

Apply to All

Select this box to use the chosen setting on all the echograms of the same type.

Related tasks

Controlling the gain and range settings, page 116

Related dialog boxes

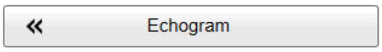
Echogram page, page 735

Conceptual descriptions

About sound wave propagation, page 769

Echogram dialog box

The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. Two pages control the horizontal lines and the echogram type with applied TVG (time variable gain). One page controls how fast the echogram travels horizontally across the presentation.



Prerequisites

This dialog box is not available when ADCP is activated.

How to open

This dialog box is opened from the **Active** menu.

Description

The **Echogram** dialog box is the main source for all echogram presentation choices. This dialog box contains a number of pages selected from the menu on the left side.

Note

The setting you choose will only be valid for the currently active echogram. Click in any echogram view to make it active. The active echogram view is identified with a thicker border. Select **Apply to All** *if you wish to use the chosen settings on all the echograms of the same type.*

Related topics

Lines page, page 732
Echogram page, page 735
Horizontal Axis page, page 738

Beam Direction function

The purpose of the **Beam Direction** function is to turn the echogram presentation up-side down. This is typically used if the EK80 transducers are located on the seabed, or on the bottom of a fish cage, facing upwards.

How to open

This function is opened from the **Active** menu.

Description

The EK80 is a versatile Wide band scientific echo sounder. One of its many areas of application is in fish farming. One single EK80 installation can then be used to monitor the fish behaviour and food waste in a large number of fish cages. The transducers are then physically installed inside the cages with the transducer facing upwards.

The EK80 transducers can also be placed at the seabed in open water - or in a river - for long-term monitoring of the ecosystem. Due to the fact that several transceivers and transducers can be used simultaneously, you can for example establish an acoustic "fence" to monitor fish passage.

In order to adjust the echogram presentations to this use, the **Beam Direction** function is introduced. Unlike the presentation on a traditional fish finding echo sounder, you can select *Upwards* mode. The presentation is then adjusted for a transducer located at the bottom of the echogram looking up towards the sea surface.

Details

Downwards

> The echogram presentation on the EK80 is shown as on a traditional fish finding echo sounder. The sea surface is at the top of the echogram. The transducers are located close to the surface, and the beams are faced from the top of the presentation and towards the bottom. Use this presentation when the EK80 transducers are installed under the hull of a vessel.

Upwards

> The echogram presentation on the EK80 is turned up-side down. The sea surface is still at the top of the echogram. However, the transducers are located at the bottom, and the beams are pointed from the bottom of the presentation and upwards

towards the surface. Use this presentation when the EK80 transducers are installed on the seabed, or at the bottom of fish cages or tanks.

Apply to All

Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.

Related tasks

Installing one or more transducers, page 295

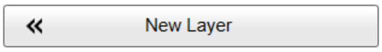
Installing towed body transducers, page 299

Related dialog boxes

Transducer Installation page, page 673

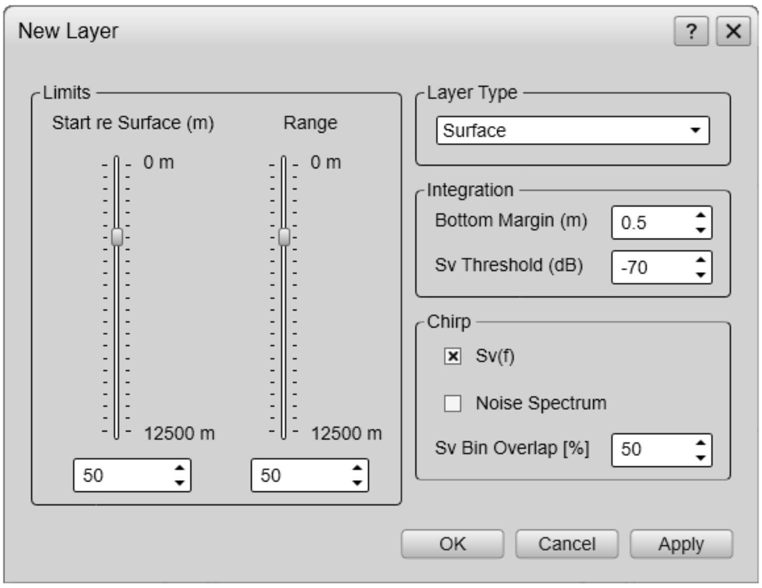
New Layer dialog box

The **New Layer** dialog box is used to create and insert a new depth layer.



How to open

This dialog box is opened from the **Active** menu



Description

Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis.

Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.

Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

Tip

Once a depth layer has been made you can change its properties using the **Layer Properties** *dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view.*

To delete a layer, select it in the echogram or in the Numerical information pane (layer data shown with red text), and then click **Delete Layer**.

The Numerical information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

When a layer is established, it is drawn with two horizontal lines in the echograms. The lines identify the upper and lower depth settings. If you have only one layer, it will always be "active", and shown with red lines. If you have more than two layers, the "active" layer is shown with red lines, while the others are shown with black lines.

Details

Limits

Use these settings to control the upper boundary (start depth) and the range of the depth layer.

- **Start Relative Surface**

  When a *Surface* or *Pelagic* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the surface depth.

- **Start Relative Bottom**

  When a *Bottom* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the bottom.

- **Range**

  This parameter controls the vertical depth range for the layer. Positive values are always downwards. A start range relative to bottom of for example -10 m means 10 m above the bottom.

Layer Type

You can choose from three different layer types.

- **Surface**

  The range settings for the layer are referenced to the surface. The layer is downwards limited by the detected bottom depth if this value is shallower than the specified lower range limit for the layer. "Pings" without a bottom detection are ignored in the calculations.

- **Pelagic**

  The range settings for the layer are referenced to the surface. The layer is not downwards limited by the detected bottom depth.

- **Bottom**

  The range settings for the layer are referenced to the bottom. The layer is downwards limited by the detected bottom depth.

Integration

- **Bottom Margin**

  When you set up the EK80 to measure and calculate echoes from the water column, the bottom echo must be avoided. The strength of this echo will greatly influence the other acoustic measurements. Use the **Bottom Margin** option to define a vertical depth segment above the detected bottom echo. The data in this segment will not be included in the calculations.

- **Sv Threshold**

  The **Sv Threshold** option is a filter. It will remove the weakest echoes from the calculations the EK80 do.

  Example

  If you are bothered by plankton while investigating other species with higher target strength, use the **Sv Threshold** option to remove the plankton echoes.

Chirp

- **Sv(f)**

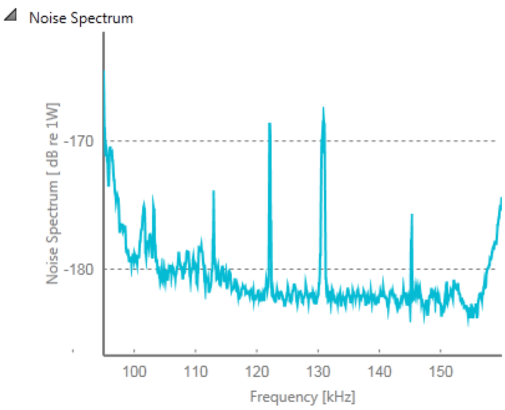
  This is an "on/off" switch. This option is by default "on".

  The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them.

  In order to study the targets in a volume of water, we recommend that you confine the targets to a dedicated depth layer to isolate the interesting echoes. The layer would then for example "highlight" a school of fish. Without this layer the default background layer will be used, but it may often offer too much data from other echoes.

  Extracting and computing the necessary volume backscatter to create the plot in the *Sv(f)* information pane requires a lot of resources from your Processor Unit. For this reason, you can switch off this functionality for the "active" depth layer. You will then loose the plot in the *Sv(f)* information pane.

- **Noise Spectrum**

  This is an "on/off" switch. This option is by default "off".

  The **Noise Spectrum** option displays the current background noise in the echogram view. The noise echoes are not TVG compensated, so they will appear with "true" values on all depths. In most cases, this presentation is only used in passive mode. When activated, a noise spectrum plot is added to the **Layer** list in the *Numerical* information pane.

- **Sv Bin Overlap**

  When the EK80 calculates the volume backscatter, it divides the total vertical range of the depth layer to "segments". These segments are stacked on top of each other. The segments may overlap, and the **Sv Bin Overlap** option controls (in %) how much they overlap.

  If you set the value to 0%, they will not overlap at all. This will reduce the computing requirements, but the resulting data will be less accurate. If you set the value to 50% (default value), each part of the segment will be computed twice because of the overlap. At the same time, the computing requirements are acceptable, and the resulting data is accurate.

  The **Sv Bin Overlap** option is not available when the **Sv(f)** option is disabled.

Related tasks

Creating a new depth layer, page 189

Modifying the properties of an existing depth layer, page 191

Deleting a depth layer, page 193

Monitoring the numerical information in a depth layer, page 195

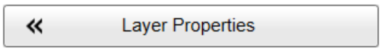
Related dialog boxes

Layer Properties dialog box, page 616

Delete Layer function, page 620

Layer Properties dialog box

The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer.

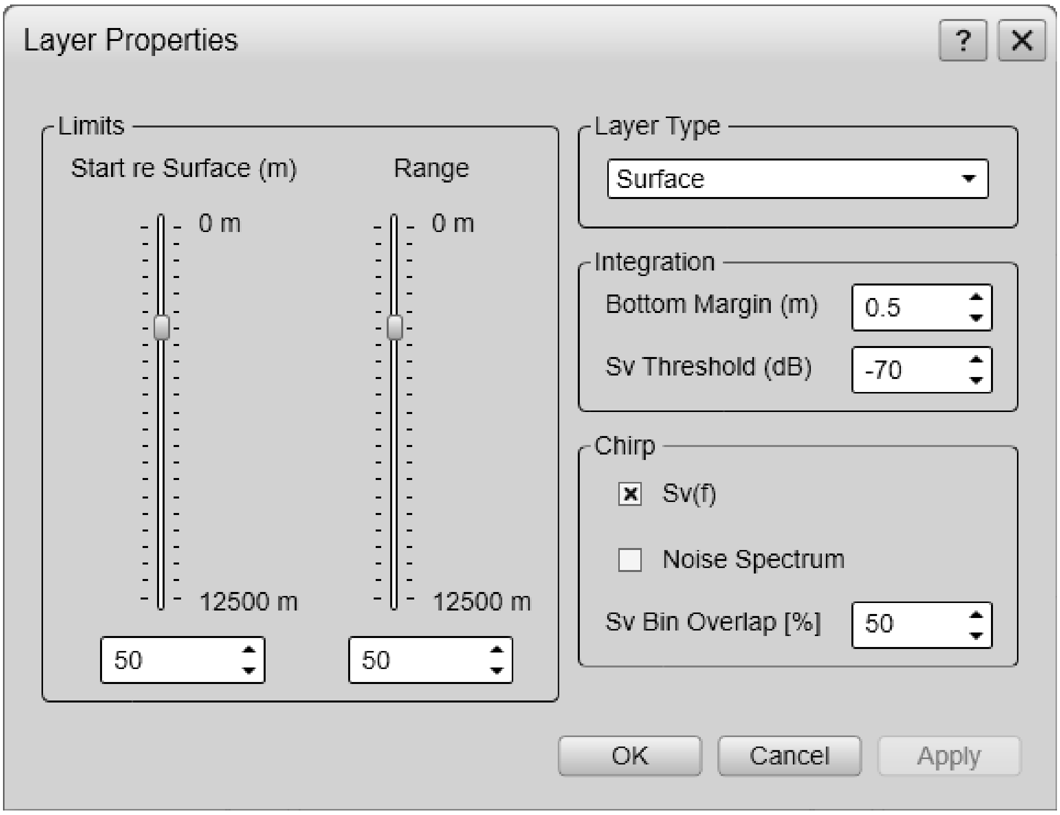


Prerequisites

To open the **Layer Properties** dialog box, you must first select a layer in the *Numerical* information pane.

How to open

This dialog box is opened from the **Active** menu



Description

Different species often occupy different depth layers. Such layers may be defined by salinity or temperature, or simply by ambient light or the availability of food. In order to study these species, the EK80 supports a *Layer* function. By means of this function, you can create your own depth layers in the water column to improve the dynamic data required for analysis.

Layers are used to calculate various values from the echo data collected within a specific depth range in the water column.

By default, a background layer collects all the data from the range chosen on the **Main** menu. Unless you specify your own layer(s), all data presented by the various information panes are calculated from this background layer. However, with a large range selected - as in the background layer - the data will not be very accurate.

Once you create your own layer, all calculated values from this layer are displayed in the *Numerical* information pane. When the layer is selected ("activated") in the *Numerical* information pane (layer data shown with red text) or in the echogram, all data shown by the relevant information panes are calculated from the echo data within the selected layer.

Tip

To create a new layer, use the **New Layer** *dialog box.*

To delete a layer, select it in the echogram or in the Numerical information pane (layer data shown with red text), and then click **Delete Layer**.

The Numerical information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Details

Limits

Use these settings to control the upper boundary (start depth) and the range of the depth layer.

- **Start Relative Surface**

  When a *Surface* or *Pelagic* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the surface depth.

- **Start Relative Bottom**

  When a *Bottom* layer is chosen, this setting controls the depth at the upper boundary of the layer relative to the bottom.

- **Range**

  This parameter controls the vertical depth range for the layer. Positive values are always downwards. A start range relative to bottom of for example -10 m means 10 m above the bottom.

Tip

You can also change these settings by selecting the border line and drag them up and down.

Layer Type

You can choose from three different layer types.

- **Surface**

  The range settings for the layer are referenced to the surface. The layer is downwards limited by the detected bottom depth if this value is shallower than the specified lower range limit for the layer. "Pings" without a bottom detection are ignored in the calculations.

- **Pelagic**

  The range settings for the layer are referenced to the surface. The layer is not downwards limited by the detected bottom depth.

- **Bottom**

  The range settings for the layer are referenced to the bottom. The layer is downwards limited by the detected bottom depth.

Integration

- **Bottom Margin**

  When you set up the EK80 to measure and calculate echoes from the water column, the bottom echo must be avoided. The strength of this echo will greatly influence the other acoustic measurements. Use the **Bottom Margin** option to define a vertical depth segment above the detected bottom echo. The data in this segment will not be included in the calculations.

- **Sv Threshold**

  The **Sv Threshold** option is a filter. It will remove the weakest echoes from the calculations the EK80 do.

  Example

  If you are bothered by plankton while investigating other species with higher target strength, use the **Sv Threshold** option to remove the plankton echoes.

Chirp

- **Sv(f)**

  This is an "on/off" switch. This option is by default "on".

  The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them.

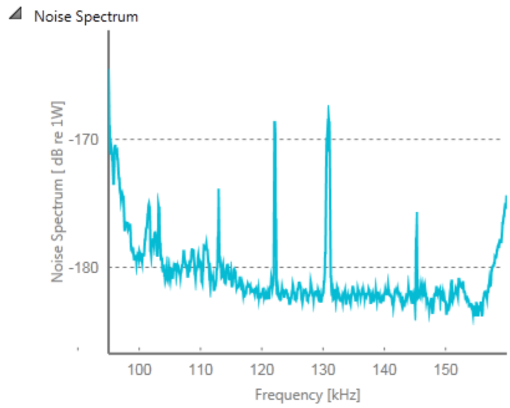
  In order to study the targets in a volume of water, we recommend that you confine the targets to a dedicated depth layer to isolate the interesting echoes. The layer would then for example "highlight" a school of fish. Without this layer the default background layer will be used, but it may often offer too much data from other echoes.

  Extracting and computing the necessary volume backscatter to create the plot in the *Sv(f)* information pane requires a lot of resources from your Processor Unit. For this reason, you can switch off this functionality for the "active" depth layer. You will then loose the plot in the *Sv(f)* information pane.

- **Noise Spectrum**

  This is an "on/off" switch. This option is by default "off".

  The **Noise Spectrum** option displays the current background noise in the echogram view. The noise echoes are not TVG compensated, so they will appear with "true" values on all depths. In most cases, this presentation is only used in passive mode. When activated, a noise spectrum plot is added to the **Layer** list in the *Numerical* information pane.



- **Sv Bin Overlap**

  When the EK80 calculates the volume backscatter, it divides the total vertical range of the depth layer to "segments". These segments are stacked on top of each other. The segments may overlap, and the **Sv Bin Overlap** option controls (in %) how much they overlap.

  If you set the value to 0%, they will not overlap at all. This will reduce the computing requirements, but the resulting data will be less accurate. If you set the value to 50% (default value), each part of the segment will be computed twice because of the overlap. At the same time, the computing requirements are acceptable, and the resulting data is accurate.

  The **Sv Bin Overlap** option is not available when the **Sv(f)** option is disabled.

Related tasks

Creating a new depth layer, page 189

Modifying the properties of an existing depth layer, page 191

Deleting a depth layer, page 193

Monitoring the numerical information in a depth layer, page 195

Related dialog boxes

New Layer dialog box, page 612

Delete Layer function, page 620

Delete Layer function

The **Delete Layer** function allows you to delete the currently selected ("active") depth layer.

Delete Layer

Prerequisites

To use the **Delete Layer** function, you must first select a depth layer in the *Numerical* information pane.

How to open

The function is opened from the **Active** menu

Description

The selected layer is deleted once you click the button. Once deleted, you can not "undo" the operation.

Tip

To create a new layer, use the **New Layer** *dialog box.*

Once a depth layer has been made you can change its properties using the **Layer Properties** *dialog box. If you only wish to change the range settings, you can also click and drag the line(s) in the echogram view.*

The Numerical information pane is the best tool for controlling your depth layers. All layers are listed, even those that may be located outside your current echogram presentation. The different layers can easily be activated by clicking the list of numerical data.

Related tasks

Creating a new depth layer, page 189

Modifying the properties of an existing depth layer, page 191

Deleting a depth layer, page 193

Monitoring the numerical information in a depth layer, page 195

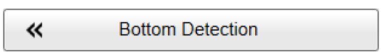
Related dialog boxes

New Layer dialog box, page 612

Layer Properties dialog box, page 616

Bottom Detection dialog box

Locating the bottom is important for the EK80. The purpose of the **Bottom Detection** parameters are to define the upper and lower depth limits most likely to be used during the EK80 operation. You can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.



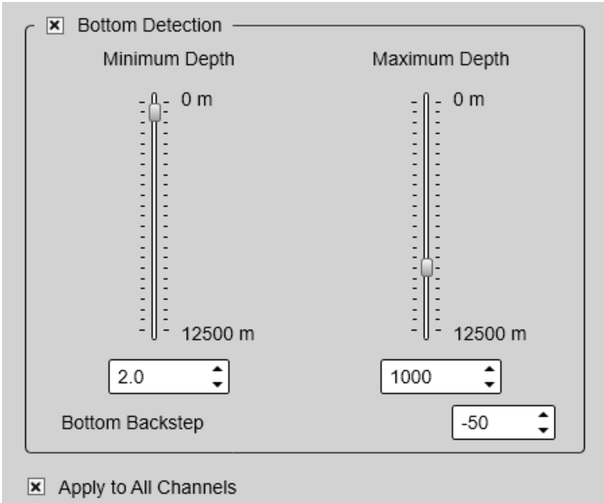
How to open

These parameters are accessed from two places in the EK80 user interface.

- The dialog box is opened from the **Active** menu
- The page is opened in the **Information Pane Options** dialog box. To open the **Information Pane Options** dialog box, select the button on the **Active** menu. You can also select the **Setup** button in the relevant information pane.

The parameters are the same. It does not matter if you open the page or the dialog box.

Description



Occasionally, difficult environmental, water or bottom conditions may inhibit a *bottom lock*. The EK80 needs this *bottom lock* to locate the correct depth, and to stay on it during the operation, even if the depth changes continuously. The **Bottom Detection** parameters are provided to rectify this.

The **Bottom Detection** parameters provide separate limits for minimum and maximum depth. These limits may be used to obtain a *bottom lock* on the depth when the EK80 is transmitting.

The **Bottom Backstep** parameter allows you to manually modify where on the bottom echo the depth will be detected.

Tip

If you have problems with bottom detection, you may consider disabling it. This can be useful if you only wish to study targets in the water column.

Details

Bottom Detection

This is an "on/off" switch. Select the box to enable the function.

Maximum Depth

The search for the bottom echo extends down to this depth whenever bottom track is lost.

Use a slightly larger depth value than the deepest spot you expect to visit. This will prevent annoyingly long ping intervals every time the bottom track is lost. A depth value of either 0 (zero) or less than the minimum depth disables the bottom detector.

Note

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The EK80 will not detect the bottom at all, and the displayed depth will be 0.00 m.

Minimum Depth

The bottom detector starts the search for the bottom echo at this depth. The detector will fail in shallow water if you select a too large depth value, and the tail of the transmitting pulse may cause problems if a too small value is set.

Note

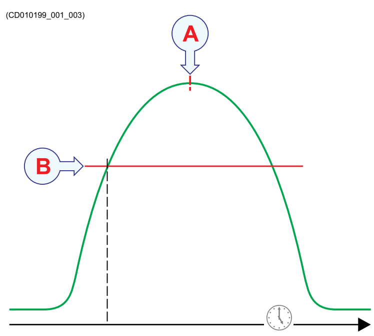
If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The EK80 will not detect the bottom at all, and the displayed depth will be 0.00 m.

Bottom Backstep

This parameter allows you to manually modify where on the bottom pulse the depth shall be detected. The setting does not have an effect on the ability to detect and track the bottom.

A *The peak of the bottom pulse*

B *-50 dB is the default bottom backstep level*



The bottom pulse basically identifies the bottom depth just prior to the peak of the pulse (A). However, this may not be the true bottom. For example, if the bottom pulse is generated by a rock bottom under a thick layer of mud, the actual depth is slightly shallower. For this reason, the EK80 is by default set up to give you a depth reading a few milliseconds before the peak of the pulse. This is done by setting the bottom backstep level to a default value of -50 dB (B).

The actual bottom will never appear at the peak of the bottom pulse (A), it will always be slightly before the peak. By changing the **Bottom Backstep** parameter you can detect the bottom earlier.

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Return to...

Information Pane Options dialog box, page 628

Related tasks

Getting started, page 93

Choosing operating mode and key transmit parameters, page 105

Related information panes

Depth information pane description, page 465

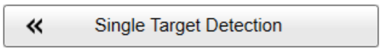
Single Target Detection dialog box

The **Single Target Detection** parameters are used to control the operational settings for the detection of single targets. In order to detect single fish correctly, these parameters must be defined to suit the target characteristics. The chosen settings do not have any effect on the raw data you save during the survey.

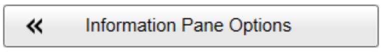
How to open

The **Single Target Detection** dialog box can be opened from several places in the EK80 user interface.

- The dialog box is opened from the **Active** menu

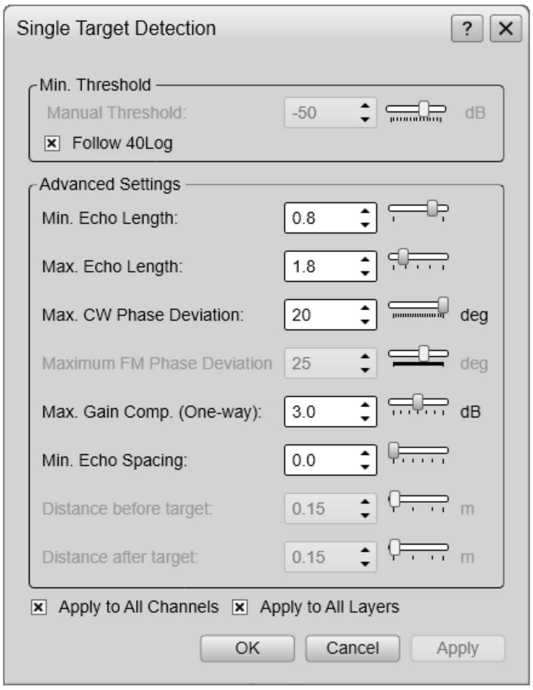
- The **Single Target Detection** page can be opened in the **Information Pane Options** dialog box. To open the **Information Pane Options** dialog box, select the button on the **Active** menu.

  You can also select the **Setup** button in the relevant information pane.

- The **Single Target Detection** dialog box can be opened from the third and fourth page in the **Calibration Wizard**. In order to start this wizard, the EK80 must be in either *Normal* or *Replay* mode.

Description



Several specific parameters are available for studies of single fish. In order to detect single fish correctly, these parameters should be defined to suit the target characteristics.

Note

The settings you make in the **Single Target Detection** *dialog box have no effect on the raw data you record. The settings are only used during the real-time presentation of the data.*

During calibration, the settings are used to maximize the detection of the calibration sphere, and suppress other echoes in the calibration layer.

When the **Single Target Detection** dialog box is opened, the availability of the functions reflects the current operational settings are read. Certain parameters will therefore be unavailable.

Details

Minimum Threshold

This setting applies to both CW and FM operation.

Some echoes are stronger than others. If you have noise problems, or you are bothered with for example smaller fish (different species), jellyfish or plankton, you can use the **Minimum Threshold** function to adjust the sensitivity. The target strength (TS) for a single target must exceed this threshold (in dB) to be accepted.

Use this function to define a "filter" value.

Follow 40 Log

Select this option to let the threshold follow the minimum level defined on the **Colour Scale** page for the corresponding channel.

Minimum Echo Length / Maximum Echo Length

These settings only apply to CW operation.

The echo from a single target will normally have a similar (or slightly longer) length than the length of the transmitted signal. This is due to the physical properties of the target.

Some single targets are so close in range that they are overlapping. These will give you a longer echo than the length of the transmitted pulse. It is important that such multiple targets are excluded. By using the echo length values, you can define the maximum and minimum length of the echo compared to the transmitted pulse. If the echo is too long or too short, it will be excluded.

Example

If you set **Minimum Echo Length** to 0.8, all echoes shorter than 0.8 times the length of the transmitted pulse will be deleted.

If you set **Maximum Echo Length** to 1.8, all echoes longer than 1.8 times the length of the transmitted pulse will be deleted.

Maximum CW Phase Deviation

This setting only applies to CW operation.

Several single targets occurring at the same range will give you echoes in different parts of the beam's cross section. All samples in an echo from a single target will normally have similar phase value (angles) as the samples arrives from the same location. Echoes from multiple targets or random noise will show great variation in phase.

To remove the bad targets, the angle (phase) between the samples in the echo are measured. If the angle is too large, the echoes are deleted.

Maximum FM Phase Deviation

This setting only applies to FM operation.

Several single targets occurring at the same range will give you echoes in different parts of the beam's cross section. To remove the bad targets, the angle (phase) between the samples in the echo are measured. If the angle is too large, the echoes are deleted.

If the angle at a given range is too large, this indicates multiple targets.

Maximum Gain Compensation

This setting applies to both CW and FM operation.

Not all single targets are located in the centre of the beam. Targets located off centre will offer weaker echoes due to the beam properties. The EK80 automatically compensates for this using a mathematical model, and you can manually control the effect of this algorithm by defining a maximum gain value.

Using the 3 dB setting all echoes from within the nominal beam width of the transducer will be accepted. By reducing the value, you will only accept echoes that appear closer to the centre of the beam. Reducing the value of this parameter will effectively narrow the beam opening angles for single target detections, but will normally improve the accuracy of the target strength values for the detected single targets.

Minimum Echo Spacing

This setting only applies to CW operation.

This parameter defines the minimum distance between two single echoes when you are using CW pulses. If they are too close, the echoes are skipped.

The distance is defined as a relation to the length of the transmitted signal. Selecting *1* means that the minimum spacing corresponds to the physical distance covered by the transmit pulse. Increasing the value will require the targets to be further separated, but can improve the accuracy of the target strength values.

Tip

Overlapping targets will not be identified with this function. Use the **Minimum Echo Length***,* **Maximum Echo Length** *and* **Maximum CW Phase Deviation** *to handle these.*

Distance Before Target / Distance After Target

These settings only apply to FM operation.

The **Distance Before Target** and **Distance After Target** settings define the required spacing before and after one target to the end and beginning of the next target. This is the same functionality as the **Minimum Echo Spacing** function for CW operations, but the algorithms are very different.

They also define the range of target samples which are used for Fourier transformation to create the target strength frequency response (the curve in the *TS(f)* information pane) and the target position phase values.

Increasing the distance values will require the targets to be further separated, but can increase the frequency resolution for the target strength frequency response (in the *TS(f)* information pane).

The value for the **Distance After Target** should normally be larger than the value for **Distance Before Target** due to the backscattering properties of a target. The values are specified in meters and are applied on the matched filtered/pulse compressed sample data.

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Apply to All Layers

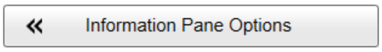
Select this box to apply the current selection to all the depth layers you are using on the EK80.

Return to...

Information Pane Options dialog box, page 628

Information Pane Options dialog box

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. Several of the information panes are fitted with a **Setup** button. Select **Setup** to open the **Information Pane Options** dialog box. Use the **Information Pane Options** dialog box to change the operating parameters for the data provided in the information panes.



How to open

This dialog box is opened from the **Active** menu. You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.

Description

The **Information Pane Options** dialog box offers a menu on the left side, and several pages for pane parameters on the right side.

Related topics

Bottom Detection dialog box, page 621
Single Target Detection dialog box, page 624
Calculation Interval dialog box, page 599
Colour Scale page, page 724
TS Histogram page, page 727
Sv(f) page, page 728
TS(f) page, page 729
ADCP page, page 729

Combined View Settings

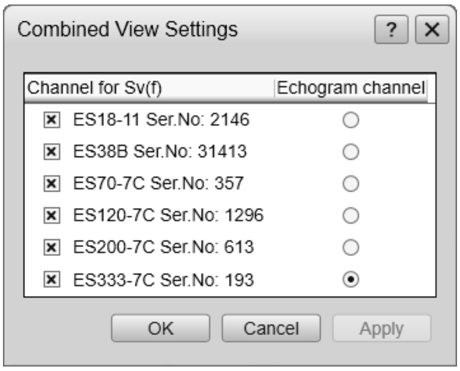
The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. In order to collect information from more than one channel in the *Sv(f)* information pane, you can use the **Combined View Settings** functionality to "combine" echo data from several channels.

Prerequisites

The dialog box can only be opened if you have more than one channel in your EK80 presentation. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

How to open

You open this dialog box from the **Active** menu.



Description

The **Combined View Settings** dialog box lists all your current channels. When activated, a dedicated view is created to hold the information pane and one echogram.

On the left side of the dialog box, select which channels to be included in the combined *Sv(f)* information pane. On the right side, select which channel to be included in the dedicated channel view.

Related tasks

Creating a *Sv(f)* information pane with echo data from multiple channels, page 182

Related topics

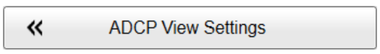
Sv(f) information pane description, page 476

ADCP View Settings dialog box

Use the **ADCP View Settings** dialog box to select the ADCP views you want to see. You can also define the parameters for these views. This includes horizontal axis units, labels, lines and ticks. These features are implemented to enhance the ADCP data presentation.

How to open

You open this dialog box from the **Active** menu.



Description

In the **ADCP View Settings** dialog box you can add new ADCP views and select display settings for the individual ADCP views.

Related topics

Horizontal Axis page, page 740
Lines page, page 741
View Selection page, page 744

ADCP Editing dialog box

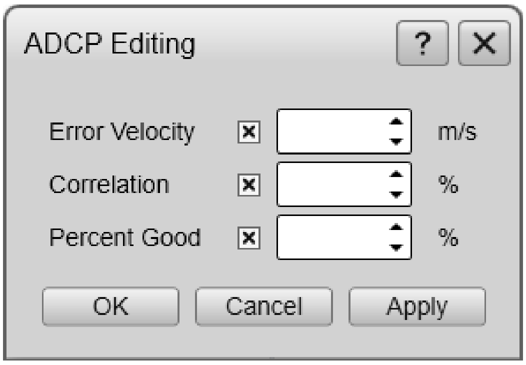
Error Velocity, **Correlation** and **Percent Good** are all quality measurements for the water velocity measures made in ADCP. They are used to filter out velocity measurements which do not pass the quality criteria.**ADCP Editing** dialog box allows you to enable and adjust their threshold values.

How to open

You open this dialog box from the **Active** menu.

Description

In the **ADCP Editing** dialog box you enable and set the threshold values for **Error Velocity**, **Correlation** and **Percent Good**.



Details

Error Velocity

Error velocity is the difference between two estimates of the vertical velocity. Low error velocity indicates the velocities in the ADCP beams are homogenous and of high quality.

The **Error Velocity** quality measurement applies to **Vessel Velocity** and **Geo Velocity** views and data.

When **Error Velocity** is enabled, velocity estimates with an error velocity value above the specified threshold value are removed, or edited out from the ADCP views and data.

Error Velocity is measured in m/s or knots.

Correlation

Correlation is a measure of similarity between the two sets of received echoes from which the velocity along each beam direction is estimated. If the difference is small, correlation is high and the signal sequences are similar. **Correlation** quality measurement applies to **Beam Velocity**, **Vessel Velocity** and **Geo Velocity**. When **Correlation** is enabled, velocity estimates with a value below the specified threshold value are removed, or edited out, from the ADCP views and data.

Correlation is measured in percent.

Percent Good

The **Percent Good** data is a measure of what fraction of velocity data which passed the error velocity and correlation threshold tests.

Percent Good quality measurement applies to **Vessel Velocity** and **Geo Velocity**. When Percent Good is enabled, velocity estimates having a percent good value below the specified threshold value are removed, or edited out, from the ADCP views and data.

Related tasks

Exploring water velocities using ADCP, page 197

Setting up the ADCP presentation, page 212

Related topics

Acoustic Doppler current profiler, page 779

Related dialog boxes

Pages in the ADCP View Settings dialog box, page 739

Pages in the Output dialog box

A key function of the EK80 is its ability to export data. The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location.

Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This dialog box is opened from the **Operation** menu. The **I/O Setup** page can also be opened from the **Installation** dialog box. The **Installation** dialog box is located on the **Setup** menu.

Description

This dialog box contains a number of pages selected from the menu on the left side.

Topics

File Setup page

A key function of the EK80 is it ability to record echo data. To retrieve the data files you need to know where they are, and which file names that have been used. The purpose of **File Setup** is to define the file and folder properties for the data files that you are recording. You can select the disk and folder for the files, the maximum file size, and a prefix for the file names.

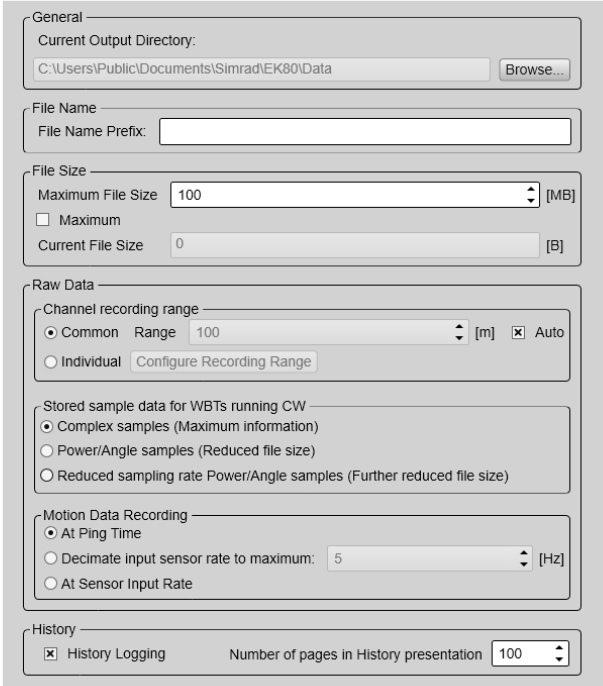
Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This page is located in the **Output** dialog box. To open, select it on the **Operation** menu.

Description



File Setup controls how and where the recorded files are saved on the Processor Unit hard disk, or on an external storage device. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. You can also define a maximum size of the files.

Tip

Set up the file and folder parameters *__before__* *you start the recording. If you wish to save your recorded data on an external hard disk, make sure that it is connected to the Processor Unit.*

If the current file size gets too big during recording, select **Split File** *on the* **Record RAW** *button. This will close the current file, and then automatically continue recording to a new file.* **Record RAW** *is located on the* **Operation** *menu.*

Details

Current Output Directory

Define the output directory for the recorded files. This text box shows you the file path that is currently used to store the data files. Select **Browse** to choose a different output directory (folder) to store the files. A standard operating system dialog box is used. You are also permitted to create a new folder.

Note

In order to change the output directory, both **Record RAW** *and* **Record Processed** *recording must be set to Off.*

File Name Prefix

Define a file name prefix. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. Type any text into the box. The chosen name will be used as prefix on all the file names. Observe the file name limitations in the operating system.

Max(imum) File Size

Define the maximum amount of bytes to be contained in one data file. Select **Maximum** for 1 GB file size.

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. The EK80 is not provided with unlimited disk capacity. We recommend that you either save the data files to an external storage device, or use a network disk.

Current File Size

The current size of the RAW data file is displayed during data recording. If the current file size gets too big during recording, select **Split File** on the **Record RAW** button. **Record RAW** is located on the **Operation** menu.

Raw Data: Channel recording range

Before you start recording, you must specify the range you wish to use. The **Range** setting defines the vertical range from the start depth and down. In other words, this is the vertical distance between the "top" and the "bottom" of the detection area. The EK80 will only record the echo data retrieved between the selected **Start Range** setting and the total range. The depth range is selected in meters.

In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

- Select **Common** to use the same recording range for all your active channels. Use **Range** to define the depth range to collect data from.

  There are many depth settings in the EK80. Select **Auto** to allow the EK80 to automatically find the required range value. This range value attends to the depth chosen in the presentation, the bottom detector settings, and any layer that defines a depth that is not visible in the echogram.

- Select **Individual** to use the different recording ranges for your active channels. Limiting the recording range for high frequency channels is useful to reduce file size.

Raw Data: Stored sampled data for WBTs running CW

The **Stored sampled data for WBTs running CW** options can be used to reduce the amount of recorded data when you are using a Wide Band Transceiver (WBT) with CW pulses.

- Select **Complex samples** to use the default data format.

  This is the data format that was first introduced with the EK80. The format stores the maximum amount of information, but requires a larger data storage capacity.

- Select **Power/Angle** to reduce the file sizes.

  This will store the data using the Wide Band Transceiver (WBT) sample rate, but on the format used by the General Purpose Transceiver (GPT).

- Select **Reduced sampling rate Power/Angle samples** to minimize the file sizes.

  This will store the data with both the sample rate and format used by the General Purpose Transceiver (GPT).

Note

Unless you choose **Complex samples** *your RAW data files will contain less information.*

Raw Data: Motion Data Recording

When the EK80 receives motion data from a sensor, these data will typically be refreshed at 100 Hz. The motion data are always included in the raw data for every ping. The **Motion Data Recording** function allows you to control how often the motion data are saved in the raw data file.

- **At Ping Time**: The motion data are saved for every ping.
- **Decimate Input Sensor Rate to max**: The motion data are decimated, and are saved at the chosen rate.
- **At Sensor Input Rate**: The motion data are saved every time information is provided by the sensor.

If motion data is saved more often than every ping, the additional information are saved in the MRU0 datagram.

History Logging

The *History* function saves the echogram images automatically on the Processor Unit hard disk These images can be recalled using the *History* information pane. The information in the *History* presentation is the same as on the original echogram presentation. The number of history files is limited. After reaching the maximum number of files, the latest echogram picture overwrites the oldest one. The history function still allows you to quickly look through echogram pictures from several hours.

Every time the history file is saved to the hard disk, the pinging may be interrupted. It is therefore possible to disable the *History* function. You can also reduce the number of history files to save space on the computer's hard disk.

Note

If you open the History information pane while history logging is disabled, the information presented reflects the latest echoes recorded before the logging was disabled. When history logging is enabled after some time, you will have a "hole" in the ping sequence.

Return to...

Output dialog box, page 586

Related tasks

Recording and replaying raw echo data, page 127

Recording and exporting processed echo data, page 137

Related functions

Record RAW function, page 582

Record Processed function, page 584

Related information panes

History information pane description, page 462

I/O Setup page

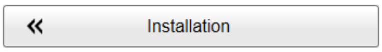
In order to communicate with peripheral devices, the Processor Unit offers several serial and/or Ethernet (LAN) ports. The number of communication ports depends on how your Processor Unit is set up and configured. The **I/O Setup** settings allow you to define which information is imported by the Processor Unit. For each port, you can set up the communication parameters, and monitor the data flow.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode. The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This page is located in the **Installation** dialog box. This page is also located in the **Output** dialog box. To open, make a selection on the **Operation** or **Setup** menus.



Description

The EK80 software automatically scans the Processor Unit to locate and identify the available communication ports.

Once the software has established a list of valid interfaces, you can set up and control the communication parameters. The **I/O Setup** page provides two lists; one for serial ports and one for Ethernet (LAN) ports. Each list is supported with a set of functions to set up and monitor the communication ports. Select the port you want to work with and then select one of the buttons below the list.

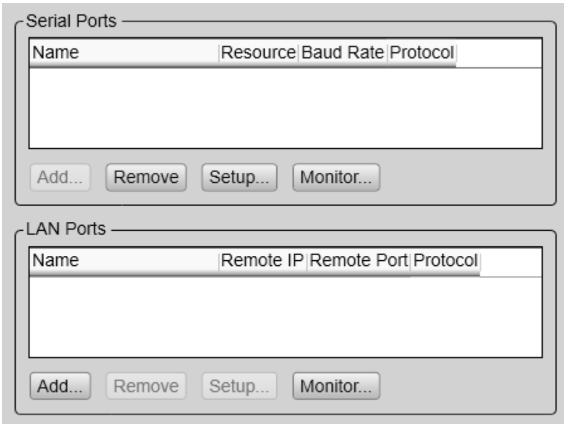
Note

You can only use the **I/O Setup** *page to add or delete serial ports and Ethernet (LAN) ports, and define the communication parameters for each port. Use the* **Sensor Installation** *page to define which external sensors your EK80 will import information from. To control the data export, use the* **Output** *dialog box.*

The **Sensors** page in the **BITE** (Built-In Test Equipment) dialog box provides an overview of all the communication lines and sensors in use. All relevant status information is provided. You open the **BITE** dialog box from the **Setup** menu.

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Details



Serial Ports

This table shows the available serial ports on the Processor Unit. The list is automatically populated the first time you open **I/O Setup** after a EK80 software installation. It then reflects the initial number of serial ports available on the Processor Unit. If you add interface hardware to your Processor Unit, you must select **Add** to add the new ports to the list.

- **Name**: This is the given identity of the serial port. By default, the ports are numbered.
- **Resource**: The Processor Unit may have several serial ports. This is the identification of the communication port. The ports are normally named COM1, COM2 and so on.
- **Baud Rate**: This is the current baud rate specified for the serial line. The communication parameters defined for NMEA 0183 are:
  - **Baud rate**: 4800 bit/s
  - **Data bits**: 8
  - **Parity**: Even
  - **Stop bits**: 1

  Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

- **Protocol**: This is the current protocol specified for the port. Each port can receive multiple datagrams simultaneously, provided that they all use the same protocol. However, only one peripheral device can be physically connected to the port. If you want to connect several peripheral devices to a single serial port, you must route them through a "mixer". This can be a hardware unit or a computer (with relevant software) collecting and streaming the datagrams.
- **Input**: This column identifies the external sensor (any type of "measuring device") that is currently connected to the port. To choose what type of device to import data from, select **Input** under the table.

LAN Ports

This table shows the available Ethernet (LAN) ports on the Processor Unit. Each Ethernet adapter on your Processor Unit supports any number of network ports. To add a new port, select **Add** under the table.

Ports that have not been initiated correctly have a red background colour.

- **Name**: This is the given identity of the network (LAN) port. By default, the ports are numbered.
- **Remote IP Address**: The **Remote IP Address** is the Internet Protocol (IP) address for a peripheral device. If the data communication between your Processor Unit and the peripheral device is set up to only import data from the device, the remote IP address is not required. If you want to export information from the Processor Unit to one or more peripheral devices (*Broadcast* mode), set **Remote IP Address** to 255.255.255.255. This is the default setting. If you want to use *point-to-point* communication in a closed network, set the remote IP address manually.
- **Remote Port**: The **Remote Port** is important if you want to export information from the Processor Unit to a peripheral device on the local area network (LAN). The application on the peripheral device will "listen" to this port number. If you want to establish *point-to-point* communication for data import from a peripheral device on the network, you may need to define the network port on this device. To find the port number on the peripheral device, consult the documentation for the device, and/or the application to be used on it. In most cases, this peripheral device is another computer on a local area network (LAN).
- **Protocol**: This is the current protocol specified for the port. Each port can receive multiple datagrams simultaneously, provided that they all use the same protocol.
- **Input**: This column identifies the external sensor (any type of "measuring device") that is currently connected to the port. To choose what type of device to import data from, select **Input** under the table.

Add

Select this button to add a new port. This is required if you have added new hardware to the Processor Unit, for example by installing an extra interface adapter. If you have previously released an unused port, but want to bring it back to EK80 use, you must also select this button. If you try to add a serial port, the button will be disabled if your Processor Unit has no more serial ports. If one or more serial ports are available, you can select a port in the dialog box that opens.

Remove

Select this button to delete a port. Once the EK80 has identified and listed all the available serial ports and LAN ports on the Processor Unit, they cannot be used by any other software. If the EK80 does not need a specific port, it can be released for other use. Click the applicable port to select it, then select **Remove** to delete the port from the list.

Note

No acknowledgement is required; the port is removed instantly.

Setup

In order to use a serial port or LAN (Ethernet) port to receive or transmit information, its communication parameters must be set up to match the peripheral device. Select one of the listed ports and then **Setup** under the table to set up the port parameters. A dedicated dialog box opens for you to change or accept the settings.

The communication parameters defined for NMEA 0183 are:

- **Baud rate**: 4800 bit/s
- **Data bits**: 8
- **Parity**: Even
- **Stop bits**: 1

Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

Monitor

If you suspect that a serial port or LAN port is ineffective, faulty or missing, you can monitor the flow of datagrams. Select one of the listed ports and then **Monitor** to observe the data communication. The **Port Monitor** dialog box opens.

Related tasks

Recording and exporting processed echo data, page 137

Interfacing peripheral equipment, page 268

Related dialog boxes

LAN Port Setup dialog box, page 750

Serial Port Setup dialog box, page 752

Port Monitor dialog box, page 754

Add Serial Port dialog box, page 756

Return to...

Output dialog box, page 586

Installation dialog box, page 602

Processed Data to Output page

Use **Processed Data to Output** to define which processed data formats to export, and which communication port to use.

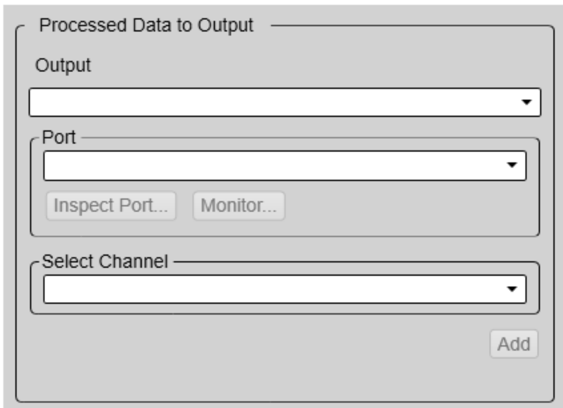
Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This page is located in the **Output** dialog box. To open, select it on the **Operation** menu.

Description



Select the output type from the list, select where to send the information, and which channel to export the data from. Select **Add** to save your choices.

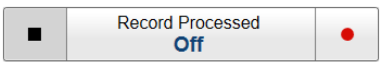
Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove or edit an output type, select it in the **Installed Outputs** box. Select **Edit** to change the settings. Select **Remove** to delete the output.

Starting and stopping recording processed data

To start and stop recording of processed data, use the **Record Processed** function on the **Operation** menu.



Details

Installed Outputs

The **Installed Outputs** box lists all the currently selected outputs. To remove or edit an output type, select it in the **Installed Outputs** box.

- Select **Remove** to delete the output.
- Select **Edit** to change the settings.
- Select **New** to add a new output.

Output

Select which datagram format to export.

Port

Select the Ethernet port or serial port you want to use for the communication.

- **Inspect Port**: Select **Inspect Port** to check the communication parameters for the port. The relevant port setup dialog box opens. You are not permitted to make any changes.

  You can not define the communication port parameters here. If you need to adjust these, you must select **I/O Setup** after you have defined the data output parameters. The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes.
- **Monitor**: Select **Monitor** to open the **Port Monitor** dialog box. The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line or LAN port.

Select Channel

Select from which channel you wish to export the data from. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

The text string identifies the channel using the following information:

- Transducer name
- Transducer serial number

Add

Select **Add** to start export of the chosen data format. Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page.

Remove

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove the output, select the relevant format in the **Installed Outputs** box, and then select **Remove**.

Edit

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To edit the settings of a specific output, select it in the **Installed Outputs** box, and then select **Edit**.

Save

Once you have finished editing the output settings, select **Save** to keep the changes.

Return to...

Output dialog box, page 586

Related tasks

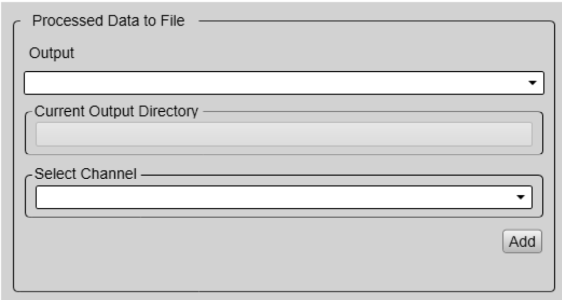
Recording and exporting processed echo data, page 137

Processed Data to File page

Use **Processed Data to File** to define which processed data formats to save, and where to place the files.

Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.



How to open

This page is located in the **Output** dialog box. To open, select it on the **Operation** menu.

Description

Select the output type from the list, select where to send the information, and which channel to export the data from. Select **Add** to save your choices.

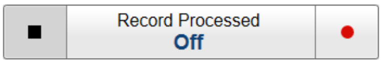
Note

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. Unless your Processor Unit is equipped with a very large disk, we recommend that you save the data to an external storage device.

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove or edit an output type, select it in the **Installed Outputs** box. Select **Edit** to change the settings. Select **Remove** to delete the output.

Starting and stopping recording processed data

To start and stop recording of processed data, use the **Record Processed** function on the **Operation** menu.



Details

Installed Outputs

The **Installed Outputs** box lists all the currently selected outputs. To remove or edit an output type, select it in the **Installed Outputs** box.

- Select **Remove** to delete the output.
- Select **Edit** to change the settings.
- Select **New** to add a new output.

Output

Select the file format you want to export.

Current Output Directory

This text box shows you the file path that is currently used to store the data files. Select **Browse** to choose a different output directory (folder) to store the files. A standard operating system dialog box is used. You are also permitted to create a new folder.

In order to change the output directory, both **Record RAW** and **Record Processed** recording must be set to *Off*.

Select Channel

Select from which channel you wish to export the data from. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. The text string identifies the channel using the following information:

- Transducer name
- Transducer serial number

File Name Prefix

Define a file name prefix. By adding a prefix to the file names you can identify the files you have recorded during a specific mission or survey. Type any text into the box. The chosen name will be used as prefix on all the file names. Observe the file name limitations in the operating system.

This option is only provided if you create outputs to the *ADCP NetCDF* format.

Maximum File Size

Define the maximum amount of bytes to be contained in one data file.

The data files will normally become very large. If you wish to record large amounts of EK80 data, make sure that you have enough space on your hard disk. The EK80 is not provided with unlimited disk capacity. We recommend that you either save the data files to an external storage device, or use a network disk.

This option is only provided if you create outputs to the *ADCP NetCDF* format.

Range

The **Range** setting defines the vertical range from the start depth and down. In other words, this is the vertical distance between the "top" and the "bottom" of the detection area. The EK80 will only export data retrieved between the sea surface and the selected depth. The depth range is selected in meters.

If relevant, you can use the channel recording range you defined for raw data recording on the **File Setup** page.

This option is only provided if you create outputs to the *ADCP NetCDF* format.

Decimation

Specify a decimation factor to reduce the sample density and the file size.

- By selecting **Decimation with 10** groups of ten samples are averaged.
- By selecting **Decimation to Depth Cell Size** all samples from the currently selected depth cell are averaged.

This option is only provided if you create outputs to the *ADCP NetCDF* format.

Add

Select **Add** to start export of the chosen data format. Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page.

Remove

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove the output, select the relevant format in the **Installed Outputs** box, and then select **Remove**.

Edit

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To edit the settings of a specific output, select it in the **Installed Outputs** box, and then select **Edit**.

Save

Once you have finished editing the output settings, select **Save** to keep the changes.

Return to...

Output dialog box, page 586

Related tasks

Recording and exporting processed echo data, page 137

Relay Output page

The EK80 allows you to export the same sensor data that was originally imported. This can "reuse" the same information on other systems. The **Relay Output** page is used to set up and control this export functionality.

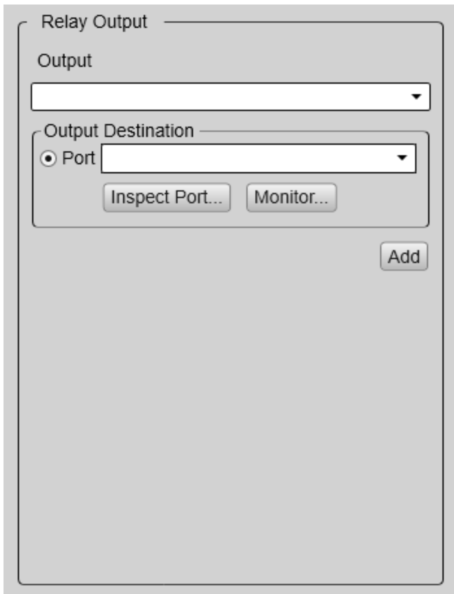
Prerequisites

The **Output** dialog box is not available when your EK80 is set to *Inactive* mode.

How to open

This page is located in the **Output** dialog box. To open, select it on the **Operation** menu.

Description



The information imported to the EK80 from various sensors can also be useful for other systems on board your vessel. The EK80 allows you to "re-export" this sensor information. When activated, the selected sensor information is sent out on the chosen communication port (serial or LAN) on the Processor Unit.

The following sensor data can be exported:

- Navigation
- Motion sensor

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove or edit an output type, select it in the **Installed Outputs** box. Select **Edit** to change the settings. Select **Remove** to delete the output.

Note

In this context, the phrase "sensor" is used to describe an external device providing information that is useful or essential for EK80 operation. Typical sensors are those providing navigational information (heading, speed or geographical position) or vessel movements in the sea (motion sensors).

You can not define the communication port parameters here. If you need to adjust these, you must select **I/O Setup** after you have defined the data output parameters. The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes.

Details

Installed Outputs

The **Installed Outputs** box lists all the currently selected outputs. To remove or edit an output type, select it in the **Installed Outputs** box.

- Select **Remove** to delete the output.
- Select **Edit** to change the settings.
- Select **New** to add a new output.

Output

Select which information to export. The following sensor data can be exported:

- Navigation
- Motion sensor

Port

Select the Ethernet port or serial port you want to use for the communication.

- **Inspect Port**: Select **Inspect Port** to check the communication parameters for the port. The relevant port setup dialog box opens. You are not permitted to make any changes.

  You can not define the communication port parameters here. If you need to adjust these, you must select **I/O Setup** after you have defined the data output parameters. The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes.
- **Monitor**: Select **Monitor** to open the **Port Monitor** dialog box. The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line or LAN port.

Add

Select **Add** to start export of the chosen data format. Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page.

Remove

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To remove the output, select the relevant format in the **Installed Outputs** box, and then select **Remove**.

Edit

Once an output type has been defined, it is listed in the **Installed Outputs** box on the left side of the page. To edit the settings of a specific output, select it in the **Installed Outputs** box, and then select **Edit**.

Save

Once you have finished editing the output settings, select **Save** to keep the changes.

Return to...

Output dialog box, page 586

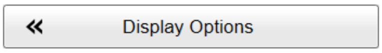
Related tasks

Recording and exporting processed echo data, page 137

Interfacing peripheral equipment, page 268

Pages in the Display Options dialog box

The **Display Options** dialog box is used to specify the basic settings for the EK80 presentation.



How to open

This dialog box is opened from the **Display** menu.

Description

This dialog box contains a number of pages selected from the menu on the left side. The choices you make in the **Display Options** dialog box have no effect on the overall performance of the EK80.

Note

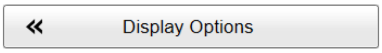
The information shown on the EK80 top bar must not be used for vessel navigation.

General page

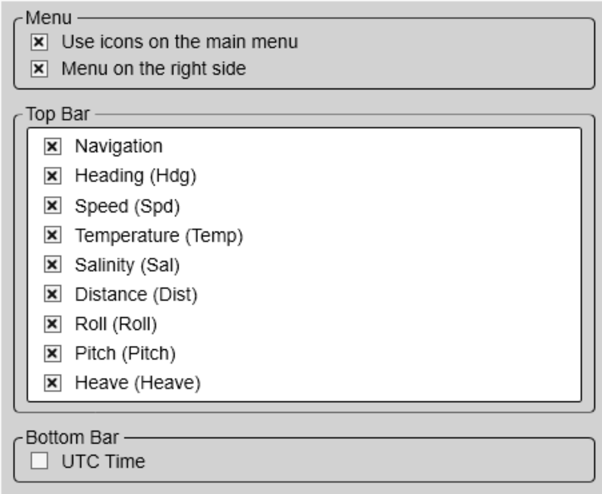
The **General** page in the **Display Options** dialog box controls the location of the menu. You can select which navigational information to be shown on the top bar. You can also choose to see Coordinated Universal Time (UTC) at the bottom of the presentation.

How to open

This page is located in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.



Description



The **General** page offers a range of "on/off switches". You use them to enable or disable the relevant functions.

Note

The information shown on the EK80 top bar must not be used for vessel navigation.

Details

Menu on the Right Side

Select this option to place the menu system on the right side of the EK80 presentation.

Top Bar

The EK80 top bar is located at the top of the display presentation and stretches from the far left to the far right. By means of these check boxes, you can select which elements to be shown at the top of the EK80 presentation.

For each option, the text in brackets is the identification used on the top bar. The text used to identify the depth option reflects the information you added as **Custom Name** when you installed the transducer on the **Transducer Installation** page in the **Installation** dialog box.

- **Navigation**: Select this check box to see the vessel’s current geographical position on the top bar. The position information must be provided by an external navigation system connected to the EK80.
- **Heading**: Select this check box to see the vessel's current heading on the top bar. The heading information must be provided by an external positioning system, or by a heading sensor or gyro compass connected to the EK80.
- **Speed**: Select this check box to see the vessel's current speed on the top bar. The information must be provided by an external speed log or a navigation system connected to the EK80.
- **Temperature**: Select this check box to see the current temperature on the top bar. The information must be provided by an external temperature sensor connected to the EK80.
- **Salinity**: Select this check box to see the water salinity on the top bar. The information about the salinity must be provided by an external sensor connected to the EK80.

- **Distance**: Select this check box to see the vessel's sailed distance on the top bar. The distance information must be provided by an external navigation system connected to the EK80.
- **Roll**: Select this check box to see the vessel's current roll movements on the top bar. The information must be provided by an external motion sensor (motion reference unit) connected to the EK80.
- **Pitch**: Select this check box to see the vessel's current pitch movements on the top bar. The information must be provided by an external motion sensor (motion reference unit) connected to the EK80.
- **Heave**: Select this check box to see the vessel's current heave movements on the top bar. The information must be provided by an external motion sensor (motion reference unit) connected to the EK80.
- **Depth**: Select this check box to see the current water depth on the top bar. The information is taken from the chosen transducer. The text used to identify the depth option reflects the information you added as **Custom Name** when you installed the transducer on the **Transducer Installation** page in the **Installation** dialog box.

Bottom Bar

UTC Time: Check the box to use Coordinated Universal Time (UTC). The time is shown on the bottom bar of the EK80 presentation. When disabled, the EK80 uses local time.

Note

To enable UTC time, your EK80 Processor Unit must be set up to accept the NMEA ZDA datagram. The NMEA ZDA datagram contains the universal time code (UTC), day, month, year and local time zone.

> Coordinated Universal Time (French: Temps Universel Coordonné, UTC) is the primary time standard by which the world regulates clocks and time. It is one of several closely related successors to Greenwich Mean Time (GMT). For most purposes, UTC is used interchangeably with GMT, but GMT is no longer precisely defined by the scientific community. [...]
>
> The current version of UTC is defined by International Telecommunications Union Recommendation (ITU-R TF.460-6), Standard-frequency and time-signal emissions and is based on International Atomic Time (TAI) with leap seconds added at irregular intervals to compensate for the slowing of Earth's rotation. Leap seconds keep UTC within 0.9 seconds of universal time, UT1.
>
> *Wikipedia, Copied June 2014*

Return to...

Display Options dialog box, page 589

Related tasks

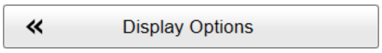
Defining settings related to user preferences and individual customizing, page 245

Tooltip page

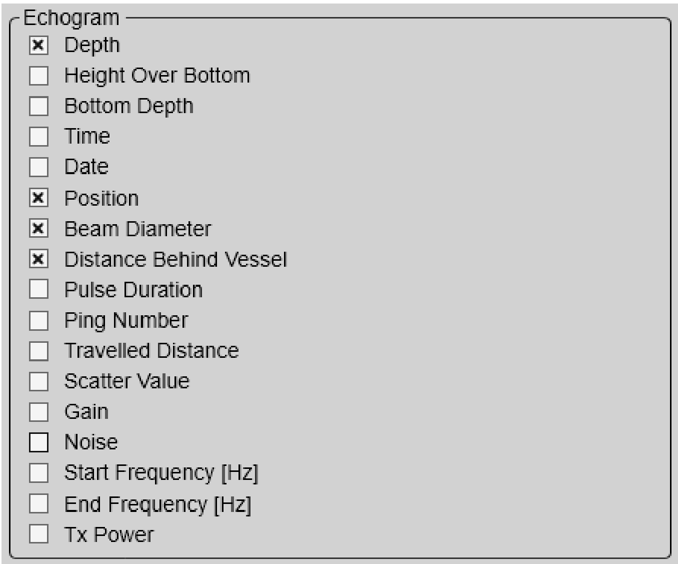
When you move the cursor over the echograms in the EK80 presentation, small "tooltips" are shown to provide additional information. The **Tooltip** page controls which tooltips that are shown.

How to open

This page is located in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.



Description



The **Tooltip** page offers a range of "on/off switches". Each tooltip is presented in the list, and you can enable or disable each of them independently.

Details

Tooltip

Several tooltips can be shown in the EK80 presentation. When a tooltip is enabled, the cursor location is detected and a small information box is shown. By default, the information is related to the exact position of the cursor. Each tooltip represents a specific piece of information, and they are listed separately.

Select an item to activate or deactivate the corresponding tooltip.

Note

The information provided for **Noise** *shows you the noise reading for the latest ping independent of the cursor's location.*

Return to...

Display Options dialog box, page 589

Related tasks

Defining settings related to user preferences and individual customizing, page 245

Pages in the Environment dialog box

Environmental parameters such as salinity, sound speed and water temperature all play an important part to present accurate echo data. Use the **Environment** parameters to define these values. Depending on the current sea and weather conditions, you may need to change these values frequently.

How to open

This dialog box is opened from the **Setup** menu.

Description

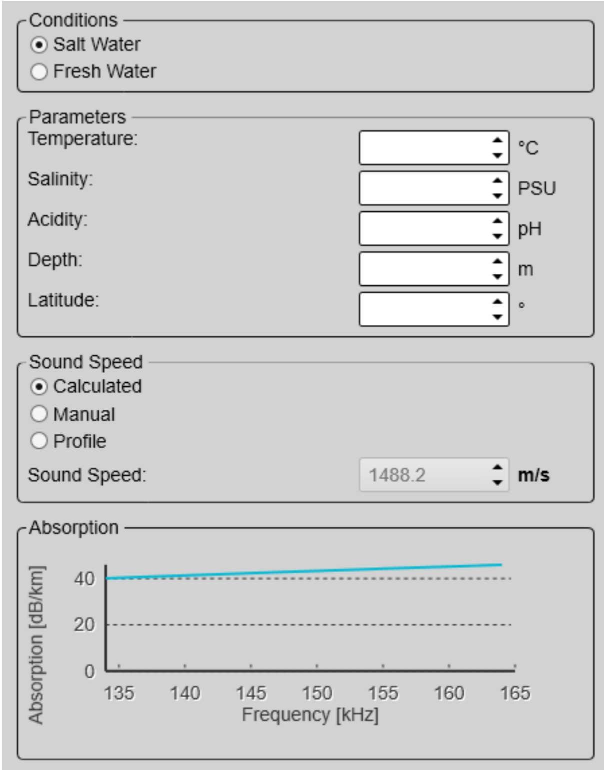
In order to obtain accurate depth readings and fish echoes, it is very important that the sound speed through the water is set correctly. Several parameters are required to calculate the correct sound speed value. If these parameters are not known to you, use the default value 1494 m/s. This is a typical mean value for sound speed in salt water. In fresh water we suggest that you set the sound speed value to 1450 m/s.

Water Column page

In order to achieve correct echo information, the current environmental parameters must be known to the EK80. The **Water Column** page collects these parameters. These must be defined to match the current conditions.

How to open

This page is opened from the **Environment** dialog box. The **Environment** dialog box is opened from the **Setup** menu.



Description

In order to obtain accurate depth readings and fish echoes, it is very important that the sound speed through the water is set correctly. Several parameters are required to calculate the correct sound speed value. If these parameters are not known to you, use the default value 1494 m/s. This is a typical mean value for sound speed in salt water. In fresh water we suggest that you set the sound speed value to 1450 m/s.

Details

Conditions

Use this setting to set up the EK80 for operation in fresh or salt water.

Sound travels with different speeds in salt and fresh water. For this reason, it is important that the EK80 knows your water profile.

The default setting is *Salt*.

Parameters

Use these settings to provide manual values.

- **Temperature**

  Provide the current water temperature. Once the salinity and temperature information is provided, the EK80 calculates the sound speed and absorption.

- **Salinity**

  Provide the current salinity. Once the salinity and temperature information is provided, the EK80 calculates the sound speed and absorption.

- **Acidity**

  The equations used by the EK80 to calculate the absorption requires a value for acidity. Unless you have any specific reasons to apply a specific value, use the default value of 8 pH.

- **Depth**

  The equations used by the EK80 to calculate the absorption and the sound speed requires a value for depth. This is the current depth under the keel.

- **Latitude**

  The equations used by the EK80 to calculate the sound speed requires a value for latitude. This is the vessel's geographical latitude. For increased accuracy, you are permitted to provide a manual latitude. Unless you have any specific reasons to apply a specific value, use the default value of 45 degrees.

Sound Speed

In order to obtain accurate depth readings and fish echoes, it is very important that the sound speed through the water is set correctly.

- **Calculated**

  Select **Calculated** to allow the EK80 to calculate the sound speed and the absorption based on the parameters you have supplied.

- **Manual**

  This option allows you to input the sound speed manually. This can be relevant if neither a sound speed sensor nor a CTD (Conductivity Temperature Depth) sensor is available.

- **Profile**

  Select **Profile** to collect the sound speed data from the source file provided by a CTD (Conductivity Temperature Depth) sensor. Go to the **Profile** page to select the profile to be used.

Absorption

The absorption curve is calculated and drawn using the parameters provided.

Return to...

Environment dialog box, page 595

Related tasks

Defining the environmental settings, page 122

Related concepts

Sound speed algorithms, page 764

Absorption algorithm, page 765

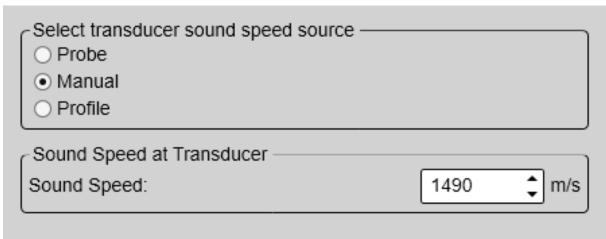
Transducer Face page

The sound speed close to the transducer face is an important parameter for maximum accuracy. You can define the sound speed at the transducer manually, or retrieve the information from a dedicated sensor. The information is currently not used by the EK80. It is saved with the raw data for use in future analysis.

How to open

This page is opened from the **Environment** dialog box. The **Environment** dialog box is opened from the **Setup** menu.

Description



Many users mount a sensor close to the transducer face in order to measure the sound speed. If the sensor is not mounted, the sound speed information must be provided manually.

The sensor is not a part of the EK80 system. This is a commercial item that can be purchased locally.

Details

Select transducer sound speed source

- **Probe**

  By selecting *Probe*, the sound speed values from the sensor are received. The information is included in the raw data files.

- **Manual**

  This option allows you to input the sound speed manually. This can be relevant if neither a sound speed sensor nor a CTD (Conductivity Temperature Depth) sensor is available.

- **Profile**

  Select **Profile** to set the sound speed at the transducer to the speed value from the profile at the transducer depth. Go to the **Profile** page to select the profile to be used.

Sound Speed at Transducer

- **Sound Speed**

  Select **Manual** to select your own sound speed value.

Return to...

Environment dialog box, page 595

Related tasks

Defining the environmental settings, page 122

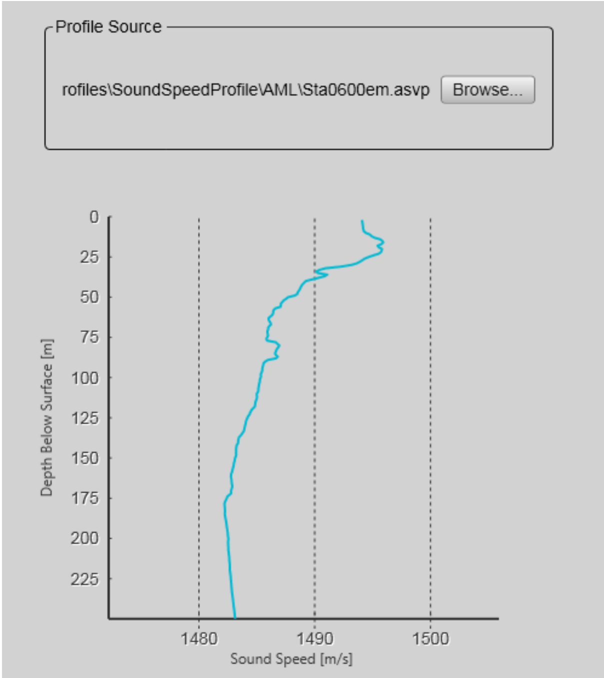
Related concepts

Sound speed algorithms, page 764

Absorption algorithm, page 765

Profile page

The **Profile** page shows the current sound speed profile. You can select a new profile provided by a CTD (Conductivity, Temperature, Depth) sensor.



How to open

This page is opened from the **Environment** dialog box. The **Environment** dialog box is opened from the **Setup** menu.

Description

You can add a sound speed profile. Select **Browse** to choose the file provided by the sensor.

You can open any `.CTD` files, as well as other formats that are supported. Once a data set has been opened it is shown on the page. To activate the current data set, select **Apply**.

Return to...

Environment dialog box, page 595

Related tasks

Defining the environmental settings, page 122

Related concepts

Sound speed algorithms, page 764

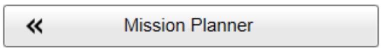
Absorption algorithm, page 765

Pages in the Mission Planner dialog box

The **Mission Planner** dialog box offers a planning and programming tool for compound EK80 operation.

How to open

This function is opened from the **Operation** menu.



Description

In the **Mission Planner** dialog box you can create, edit and remove mission plans and all elements included in mission plans.

Mission planning

A mission plan describes a pattern of transmissions ("pings") developed by you. The EK80 will perform transmission according to the mission plan. The execution of the mission plan can be stopped, paused, and restarted by the operator. To build this pattern the mission plan concept introduces a few terms.

- **Ping**

  A ping defines the properties of a transmission (ping) from a specific transducer. Each ping configuration is defined by a name at your choice as well as standard ping parameters such as transducer, frequency, power, pulse type and pulse duration. You create ping configurations in the **Ping** page of the **Mission Planner** dialog box. You can define multiple numbers of pings and combine these into ping groups for the specific transducer. To select a ping configuration in a mission plan you will need to include it in a ping group.

  Note

  Only transducers which are installed in the EK80 can be used for ping configuration.

- **Ping Group**

  A ping group is created from a collection of your ping configurations. A ping group defines the pings or transmissions which are transmitted simultaneously. In the Mission Planner dialog box you can create ping groups in the page called Ping Groups. Each ping group is identified by a name of your choice. To select a ping group in the mission plan it must be included in an ensemble.

  Note

  There can be only one ping configuration from a specific transducer in a ping group.

- **Ensemble**

An ensemble is a collection of one or more ping groups. It allows you to have different types of pings in a series. The intention of an ensemble is to perform repeating sets of different configurations. The ensemble is identified with a name that you choose. By using multiple ensembles, you can create advanced operational patterns. Use the **Ensemble** page in the **Mission Planner** dialog box to create and modify ensembles.

- **Mission Plan**

  A mission plan describes a pattern of transmissions ("pings") developed by you. A mission plan consists of a set of ping configurations and information on how to execute the pings these configurations represent. The different ping configurations defined are gathered into ping groups. The ping groups can be executed repeatedly in what is named ensembles. The mission plan includes any number of ensembles and each ensemble may be repeated a fixed number of times.In the **Mission Plan** page of the **Mission Planner** dialog box you can create the mission plan.The mission plan is identified by a name of your choice.

Saving a mission results in a file containing information of all ping configurations, ping groups and ensembles and the iterations for each. You can edit the mission plan parameters by adding or removing ensembles or changing ping configuration or ping groups. The mission plan file can be uploaded in EK80 at any give time and activated.

Click on **Select Mission** and any mission created will be listed.

Note

A mission plan can be loaded only when the EK80 is in Mission operating mode.It is not possible to copy and share mission plans between different EK80 systems. EK80 parameter values included in the mission plan are specific for each EK80 installation.

Topics

Ping page, page 660

Ping Group page, page 666

Ensemble page, page 668

Mission Plan page, page 669

Ping page

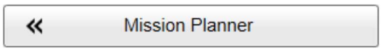
On the **Ping** page you can view, add and edit information about the pings used in the mission plan. You can also add or delete pings for use in the mission plan.

Prerequisites

The EK80 must be running in *Normal* operating mode.

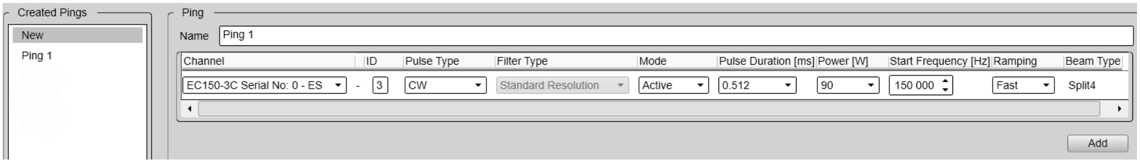
How to open

You open this dialog box from the **Setup** menu.



Description

Use the **Ping** page to create the various pings you want for you mission plans.



- **Created Pings**

  Created Pings lists all the pings you have created. Select a ping in the list to edit it's properties, or remove it. Select **New** to add a new ping.

- **Ping**

  Ping displays the selected ping with its name and parameters. You can delete or edit a ping. To create a new ping, provide its name and parameters. One row is used for each channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Details

Channel

This column identifies the channel. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. The text string provides the following information:

- Transducer name
- Transducer serial number

If you use a transceiver with multiplexing functionality, the **Normal Operation** dialog box presents each multiplexed channel separately. Some of the parameters can be chosen individually for each multiplexed channel, other parameters must be common.

ID

The **ID** parameter in the **Mission Planner** dialog box provides an identification of the channel and the parameters set for the pings in this channel.

Pulse Type

The **Pulse Type** function allows you to select the "shape" of the transmitted pulses ("pings").

- CW
- LFM

The abbreviation "CW" means "Continuous Wave". "LFM" means "Linear Frequency Modulated".

In *LFM Down* the transmitted pulse starts using the upper frequency in the range, and ends with the lower frequency. The frequency sweep is linear. In *LFM Up* the transmitted pulse starts using the lower frequency in the range, and ends with the upper frequency.

Note

In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Only the Wide Band Transceiver (WBT) supports LFM Down. Your WBT must be fitted with the latest software version.

You can only use *LFM Down* and *LFM Up* on one channel on each transceiver. Any attempt to try these modes on more than one channel will result in an error message.

Filter Type

A dedicated receive filter is available. This filter setting is only available for LFM pulses.

- **Standard Resolution**: This filter setting applies the same bandpass filters and decimations as for the previous EK80 software versions.
- **Short**: This filter setting applies short bandpass filters and the lowest possible decimation. This setting will generally result in a shorter impulse response and higher output sample rate. These resulting echo data can be used to address range sidelobe issues from the bandpass filters while examining targets near boundaries. Note that the filter is wider in frequency, and may result in a reduced signal-to-noise ration.

Note

Unless you need the short resolution due to boundaries we suggest that you use the standard resolution. This setting reduces both the noise and the amount of data We recommend that you calibrate the EK80 with the **Filter Type** *setting that you will use during the survey.*

We regard the receive filter as "experimental" and invite you to review the results.

This functionality is not available for ADCP operation.

Mode

This column specifies the current transceiver mode. You can manually select the mode that suits your current operation.

The following modes are available:

- **Active**

  The transmitter and receiver are both active. This is the normal mode for operation.

- **Passive**

  In *Passive* mode, the EK80 will receive and compute the signals detected by the transducer(s). Therefore, this mode is useful for test purposes, and when you want to measure the ambient background noise in the sea. It can also be useful to run the EK80 in *Passive* mode to discriminate between target echoes (present only in *Active* mode) and noise (present in both *Active* and *Passive* modes).

- **Test**

  The transmitter is passive while the receiver is active. This mode is not designed for operational use with the EK80.

Pulse Duration

The **Pulse Duration** setting specifies the current duration ("length") of the transmitted pulse. You can manually select a pulse duration that suits your operation.

The pulse duration can be selected according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be selected. However, when using CW transmissions a long pulse duration will reduce the resolution. It will also cause the EK80 to transmit less frequent. Remember that in the EK80, the pulse duration and the bandwidth are mutually dependant.

For CW transmissions:

- Long pulses provides longer detection range. They make the EK80 less sensitive for noise, but offer lower range resolution.
- Short pulses provides shorter detection range. They make the EK80 more sensitive for noise, but offer higher range resolution.

For FM transmissions:

- Long pulses provide longer detection range, and the range resolution is independent of the pulse duration..
- Short pulses provide shorter detection range, and they make the EK80 more sensitive for noise.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Power

You are permitted to adjust the output power of the EK80. You can not increase the power to beyond the transducer’s capacity, but you may reduce it for better performance in shallow water, or if you are struggling with reverberation.

The **Power** parameter in the **Normal Operation** dialog box displays the transmitter's output power measured in Watts. You can change the output power manually. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the <u>smallest</u>. For all practical purposes, this means that you can *reduce* the power output, but you can not increase it to beyond the power rating of the transducer.

The current setting of this parameter is also shown in the **Extras** menu.

Start/End Frequency

The **Start Frequency** and **End Frequency** parameters are used to set up a frequency sweep ("chirp"). If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wide band transmissions. In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated pulses. You must also use a transducer that supports the frequency range.

Note

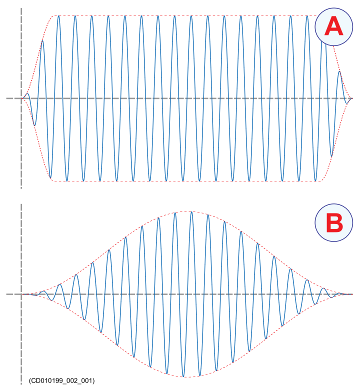
It is very important that the transducer you use complies to the frequencies you choose. The frequency range of each transducer is defined in the transducer setup file. If you choose a frequency range that is not supported, and error message will appear.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Ramping

The **Ramping** parameter provided in the **Normal Operation** dialog box defines how fast the output level of each transmission ("ping") shall increase from 0 V to maximum level. You have two options; *Fast* and *Slow*.



The principle is shown in the illustration. Curve (A) has **Ramping** set to *Fast*, and the level is increased from 0 V to maximum level using from minimum two (2) up to maximum ten (10) cycles. At the end of the pulse, maximum ten down to minimum two cycles are used to reduce the output level.

The number of cycles used depend on the q-factor (bandwidth relative to centre frequency) for the connected transducer. The number of ramping cycles will be upward limited to the number of cycles in half a pulse length.

Curve (B) has **Ramping** set to *Slow*. The output level is increased from 0 V to maximum level using the first half the pulse duration. The second half of the pulse is then used to reduce the output level.

The current setting of this parameter is also shown in the **Extras** menu.

This functionality is not available for ADCP operation.

Sequential pinging

The **Sequential pinging** function can be used if you have more than one channel in use on the EK80. When activated, each individual transceiver will transmit ("ping") in sequence, one by one. When not activated, all transceivers will "ping" simultaneously. Sequential pinging is not relevant for missions.

If two transducers are used on a transceiver, these will also "ping" simultaneously.

Tip

The **Sequential pinging** *function can be very useful if your transducers are located in such a manner that interference is a problem.*

The current setting of this parameter is also shown in the **BITE** (Built-In Test Equipment) dialog box. You open the **BITE** dialog box from the **Setup** menu.

This functionality is not available for ADCP operation.

Max(imum) Current Speed

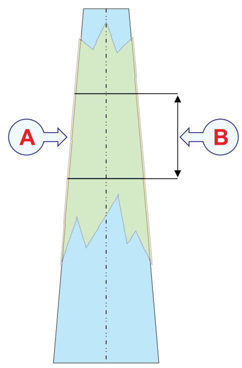
Maximum Current Speed controls the pulse duration and the processing functionality for ADCP operation. You do not need to make frequent changes to this setting. Select a value based on the expected water currents in your survey area. If you are uncertain, choose a value *above* the expected water current, and reduce it based on experience. The value you choose must always be equal or larger than the expected value.

Note

The measurement accuracy is reduced if the value is set much too large.

This functionality is only available for ADCP operation.

Depth Cell Size



A *Depth cell*

B *Depth cell size*

In water current measurements, the phrase *cell* is used to describe a *depth cell* (sometimes referred to as *bins*). These are uniform segments used by the acoustic Doppler current profiler (ADCP) to measure the velocity of the current.

The acoustic Doppler current profiler (ADCP) measures the speed and direction of the water current by means of acoustic pulses. These pulses have duration decided by the current size of the *depth cell*. Each beam can be seen as a number of depth cells evenly placed from the transducer surface and down to the lower end of the acoustic beam.

- Use smaller depth cells in shallower waters.

- Use larger depth cells in deeper waters.

  A small depth cell offers better range resolution. This makes it is easier to detect minor depth variations in the current velocity. On deeper waters, a small depth cell will gradually suffer from more and more noise. The ping rate will also be reduced due to the high amount of processing that is required. A larger depth cell tolerates more noise. For this reason, larger depth cells must be used to measure velocity in deep waters.

  This functionality is only available for ADCP operation.

Beam Type

The beam type of the connected transducer is shown. Single-beam and split-beam transducers are available.

Return to...

Pages in the Mission Planner dialog box, page 659

Related tasks

Working with a mission plan, page 227

Working with pings, ping groups and ensembles, page 234

Related dialog boxes

Ping page, page 660

Ping Group page, page 666

Ensemble page, page 668

Mission Plan page, page 669

Select Mission function, page 578

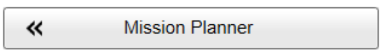
Operation function, page 569

Ping Group page

In the **Ping Group** dialog box you define the transmission parameters for each transducer in a ping group. Transducers are assigned a ping group and will accomplish various tasks based on your configuration settings. A ping group defines ping parameters such as frequency, power, pulse type and pulse duration.

How to open

You open this dialog box from the **Setup** menu.



Description

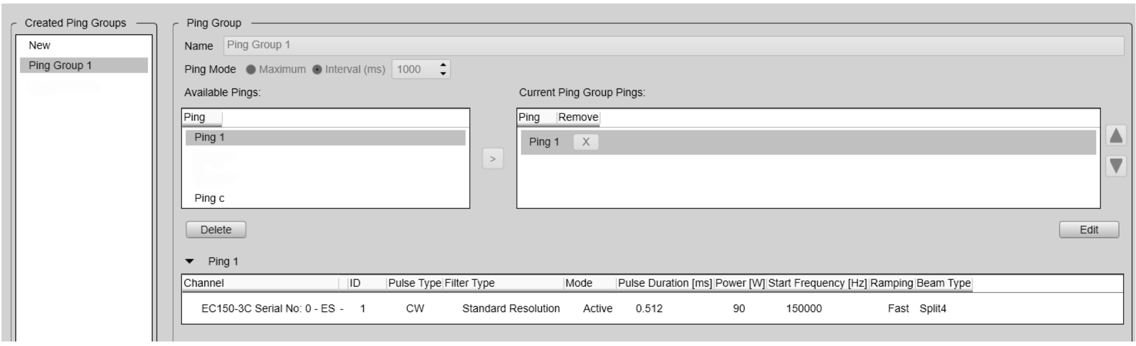
A ping group defines the properties of each transmission ("ping") for each transducer. You can define multiple ping groups for each mission. The **Ping Group** page allows you to add, delete and edit ping groups from the mission plan. Each transducer in a ping group can be modified to suit the needs of the survey.

- **Created Ping Groups**

  The **Created Ping Groups** list displays all previously created ping groups as well as the option of creating a new. You can scroll the list and highlight the ping group you would like to look at more closely. Details about a ping group is displayed to the right in the **Ping Group** page.

- **Ping Group**

  In the **Ping Group** field displays information regarding a ping group.



Details

Name

Each ping group must have a name. When you give a ping group a name you can save the ping group, edit it, and reuse it for other surveys.

Ping Mode

You use **Ping Mode** to select the interval (in milliseconds) between each transmission ("ping"). Alternatively you can select **Maximum** to get as many pings transmitted as the pulse duration allows.

Available Pings

The pings created for mission planner is listed in the Available Pings list. You can scroll the list and highlight the individual pings. The available pings are candidates for ping groups. Select ping to go in the ping group by highlighting it and selecting >. Alternatively select ping and then click **Add**.

Current Ping Group Pings

The **Current Ping Group Pings** is a list of all ping included in the ping group. You can scroll the list of pings in the ping group and highlight each ping. Select the **X** to remove a ping.

Ping Details

The **Ping Details** field displays the name of the selected ping and details regarding the ping. Select the ping in **Current Ping Group Pings** by highlighting it. Select the arrow associated to the ping name to see the details.

Return to...

Pages in the Mission Planner dialog box, page 659

Related tasks

Working with a mission plan, page 227

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Related dialog boxes

Ping page, page 660

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Select Mission function, page 578

Operation function, page 569

Ensemble page

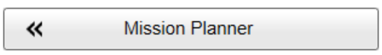
On the **Ensemble** page you can view, add and edit information about the ensembles used in the mission plan.

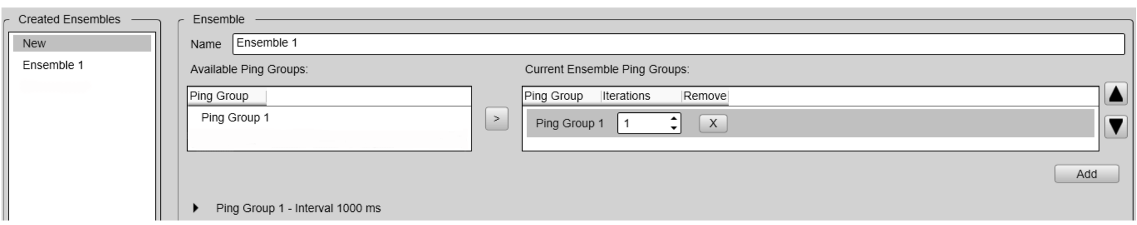
Prerequisites

- The EK80 must be running in *Normal* operating mode.

How to open

You open this dialog box from the **Setup** menu.





Description

An ensemble is a collection of one or more ping groups. The intention of an ensemble is to perform repeating sets of different configurations. The ensemble is identified with a name that you choose. By using multiple ensembles, you can create advanced operational patterns.

Details

Available Ping Groups

Available Ping Groups lists the ping groups which can be used in an ensemble. You can scroll the list of ping groups and highlight them to see more details.

Current Ensemble Ping Groups

Current Ensemble Ping Groups lists the ping groups for the selected ensemble. You can add, edit and remove ping groups as well change the repletions for a group. You can scroll the list of ping groups and highlight them to see more details. Details regarding the selected ping group can be expanded or collapsed.

Return to...

Pages in the Mission Planner dialog box, page 659

Related tasks

Working with a mission plan, page 227

Working with pings, ping groups and ensembles, page 234

Related dialog boxes

Ping page, page 660

Ping Group page, page 666

Ensemble page, page 668

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Select Mission function, page 578

Operation function, page 569

Mission Plan page

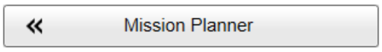
In the **Mission Plan** page you can view, add and edit information about ensembles used in the **Mission Planner**. You can also add or delete ensembles for use in the **Mission Planner**.

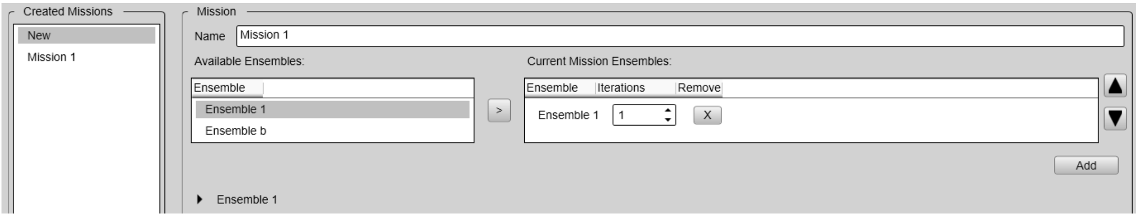
Prerequisites

The EK80 must be running in *Normal* operating mode.

How to open

You open this dialog box from the **Setup** menu.





Description

- **Created Missions**

  Created Missions lists the available missions. It is also an entry for creating a new mission.

- **Mission**

  The **Mission** field displays all information regarding the selected mission.

Details

Name

Each mission must have a name. When you give the mission a name you can save the mission, edit it and use it.

Available Ensembles

Available ensembles lists the ensembles which can be used in a mission plan. You can scroll the list and add any one to the current mission ensembles.

Current Mission Ensembles

Current Mission Ensembles lists the ensembles included in the current mission. You can scroll the list and highlight any of the ensembles to display more details regarding its configuration.

Ensemble Details

Ensemble details are displayed at the bottom of the page. It includes information for each ensemble such as number of repetitions, ping groups and pings included

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Pages in the Mission Planner dialog box, page 659

Related tasks

Working with a mission plan, page 227

Working with pings, ping groups and ensembles, page 234

Related dialog boxes

Ping page, page 660

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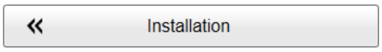
Pages in the Installation dialog box

Before you use the EK80 you must set it up to communicate with the relevant peripherals. This includes the transducer(s). Use the **Installation** dialog box to set up all interfaces with external devices, and to set up basic parameters related to installation and operation. In most cases, you only need to do this once.



Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This dialog box is opened from the **Setup** menu. The **I/O Setup** page can also be opened from the **Output** dialog box.

Description

This dialog box contains a number of pages selected from the menu on the left side.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page. When you install something (sensors, transducers, etc.), you must first select what you want to install, then define the relevant parameters, and finally select* **Add**.

Topics

Client Server Configuration page, page 708

Software License page, page 709

Transducer Installation page

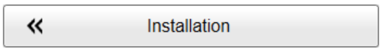
The transducers you wish to use with the EK80 must be "installed" as a part of the software configuration. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these. Unless you replace a broken transducer, or add a new, you only need to do this once.

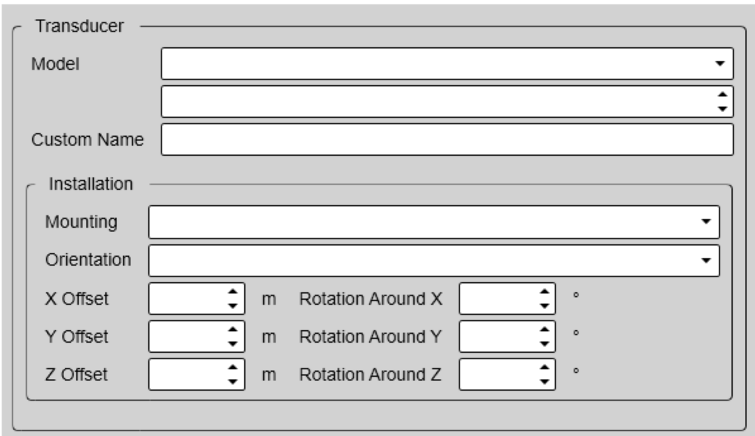
Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open, select it on the **Setup** menu.





Description

Each transducer to be added to the EK80 configuration must be selected and identified individually.

You can only choose a transducer from the **Model** list. When the transducer is selected, you must provide its serial number, and type a name that you choose yourself. Once a transducer has been installed, it is listed in the **Installed Transducers** box. To see the information you have collected about the transducer, select the relevant transducer in the list.

Tip

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

Once a transducer has been installed, you can verify its operational condition in the **BITE** *(Built-In Test Equipment) dialog box.*

If your EK80 shall only be used with an ADCP transceiver for current profiling, you do not need to install other transducers.

Details

Installed Transducers

The **Installed Transducers** box lists all the transducers that are currently installed on the EK80. Select a transducer on the list to edit its properties, or to remove it. Select **New** on the list to add a new transducer to the EK80.

Model

When you add a new transducer, you can only choose a transducer from the list.

The list is generated from a system file on your Processor Unit. It contains all the transducers that are compatible with the Wide Band Transceiver (WBT), but since the software is common for several systems there may also be non-compatible transducers in the list. The list also includes technical specifications for each transducer. You can not see this information, but it is used by the EK80 to set up the operational parameters. This allows the Wide Band Transceiver (WBT) to optimize its performance for the individual transducer models.

If you cannot find your transducer in the list, contact you dealer to upgrade the relevant software component in the EK80.

Serial number

Use this box to insert the transducer's serial number. Some new Simrad transducers with built-in "intelligence" will automatically provide this serial number.

Custom Name

Type any name that you wish to use to identify the transducer. The name you select will only be used to identify the transducer in other dialog boxes. It is not used in the echo data that you export.

Tip

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** *button to open an on-screen keyboard.*

Mounting

Use this function to specify where the transducer is installed.

Transducer(s) mounted in a towed body are supported. The towed body must include a suitable depth sensor providing the current depth in an NMEA DPT datagram. In this datagram, the second depth value (offset, in meters) must contain the towed body depth. The sensor is connected to a communication port on the Processor Unit.

If you are installing a transducer mounted in a towed body, select *Towed*.

- Set **Orientation** to *Vertical*.
- Set the vertical installation offset (Z Offset) to the distance between the transducer and the depth sensor in the towed body.

The depth of the towed body is shown in the *Numerical* information pane.

Tip

In some EK80 applications, one or more transducers are installed facing upwards. In order to adjust the echogram presentations to this use, the **Beam Direction** *function is introduced. Unlike the presentation on a traditional fish finding echo sounder, you can select Upwards mode. The presentation is then adjusted for a transducer located at the bottom of the echogram looking up towards the sea surface.*

Orientation

Use this function to specify the orientation of the transducer beam.

Example

If the transducer has been installed with the transducer face in a horizontal position, the beam is pointing straight down. You must then select *Vertical* orientation.

Offsets

The physical location of the EK80 transducer is important for the EK80 data accuracy. Use the centre of the transducer face as reference, and define the offset values related to the *Ship Origin*.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

- **X Offset**: Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the transducer is located ahead of the ship origin.
- **Y Offset**: Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the transducer is located on the starboard side of the ship origin.

- **Z Offset**: Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the transducer is located under the ship origin.

Rotation

The **Rotation** angles can be used whenever required to compensate for a rotational offset. These settings are intended for the installation of an ADCP transceiver for current profiling.

Note

These settings are intended for the installation of an ADCP transceiver for current profiling. The information is not used to adjust for installation misalignments, but will be included in the RAW files for post-processing purposes.

- **Rotation Around X**: Specify an angle (in degrees) to compensate for any deviation from the X axis (fore-and-aft direction) in the coordinate system.
- **Rotation Around Y**: Specify an angle (in degrees) to compensate for any deviation from the y-axis (athwartship direction) in the coordinate system.
- **Rotation Around Z**: Specify an angle (in degrees) to compensate for any deviation from the Z axis (vertical direction) in the coordinate system.

  Example

  Split-beam transducers have a notch or mark to indicate forward direction. The sectors in the split-beam transducer refer to this forward direction. It is therefore very important that the transducer is installed as indicated by the arrow and the physical guide cam on the transducer body. If a transducer may has been installed out of alignment you can compensate by adjusting **Rotation Around Z**.

Connection

A split-beam transducer with four sectors can be physically connected to the transceiver to work as a single-beam transducer. If you have made this connection, you must tick this box to make the EK80 operate accordingly.

Add

When you are adding a new transducer to the EK80 configuration, select **Add** to finalize to process. The transducer you have added is placed in the **Installed Transducers** list.

Edit

The **Edit** functionality on the **Transducer Installation** page makes it possible to change the information you have provided for the transducer. You cannot change the model identification and the serial number. Select **Edit** to make the relevant changes. Select **Apply Changes** to save the changes you have made.

Remove

The **Remove** functionality on the **Transducer Installation** page makes it possible to delete the information you have provided for the transducer.

Note

There is no "undo" functionality. When you remove a transducer from the EK80 configuration, you also delete all calibration information. If you later wish to re-install the same transducer, the calibration must be repeated.

Return to...

Installation dialog box, page 602

Related tasks

Getting started, page 93

Installing transducers and transceiver channels in the user interface, page 294

Installing an ADCP transceiver in the user interface, page 308

Related topics

Rules for transducer handling, page 357

Approved anti-fouling paints, page 359

Related dialog boxes

BITE (Built-In Test Equipment) dialog box, page 604

Transducer page, page 718

Related functions

Beam Direction function, page 611

Transceiver pages

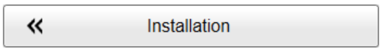
The **Transceiver** pages are used to define the settings necessary to connect the Processor Unit to each transceiver. In turn, each transceiver is assigned one or more transducers. Two pages are used. The **Transceiver Installation** page shows you a list of the available transceivers, and allows you to make the connections to the Processor Unit, and to the transducers you have installed. The **Transceiver IP Address** page allows you to control the Internet Protocol (IP) Addresses used by the Processor Unit to communicate with the transceivers.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description

The **Transceiver** pages are used to define the settings necessary to connect the Processor Unit to each transceiver. Two pages are used.

- **Transceiver Installation**

  The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers. An overview of the available transceivers is shown. As permitted by the software license, you can assign any transducer to any Wide Band Transceiver (WBT).

  Transceiver Installation page, page 679

- **Transceiver IP Address**

  If you have several transceivers in a large system, it may be useful to control the IP Addresses used to communicate with each transceiver. These IP Addresses are defined by a BOOTP server in the Processor Unit, and assigned to each Wide Band Transceiver (WBT). This functionality is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

  If you have changed the network settings, turn each transceiver off and on. EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

  Transceiver IP Address page, page 686

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Tip

Key information about the transceiver(s) can also be found in the **BITE** *(Built-In Test Equipment) dialog box.*

Return to...

Installation dialog box, page 602

Related tasks

Getting started, page 93

Installing transducers and transceiver channels in the user interface, page 294

Related dialog boxes

BITE (Built-In Test Equipment) dialog box, page 604

Transceiver page, page 716

Transceiver Installation page

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. Every time the page is opened, the EK80 software automatically performs a search on the Ethernet network for transceivers. An overview of the available transceivers is shown. As permitted by the software license, you can assign any transducer to any Wide Band Transceiver (WBT).

Description

The **Transceiver Installation** page uses these groups to collect the parameters.

- **Transceiver Channels**

  The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each channel is identified by the transceiver type and serial number and the transducer(s) in use. The current status for each channel is also provided. If you have many transceivers connected you can change the size of the **Installation** dialog box, or you can use the two arrows on the right hand side of the list to scroll up and down.

- **Transceiver Information**

  The **Transceiver Information** group shows you the technical parameters for the Wide Band Transceiver (WBT) that is used on the chosen frequency channel. Select one of the items in the **Frequency Channels** list to see the information about the relevant Wide Band Transceiver (WBT).

  The information provided under **Transceiver Information** is not required for operational use.

  The **Download Transceiver Software** function allows you to upgrade the software on the Wide Band Transceiver (WBT). Software updates are only available if and when distributed with the EK80 operational software.

- **Transceiver Browsing**

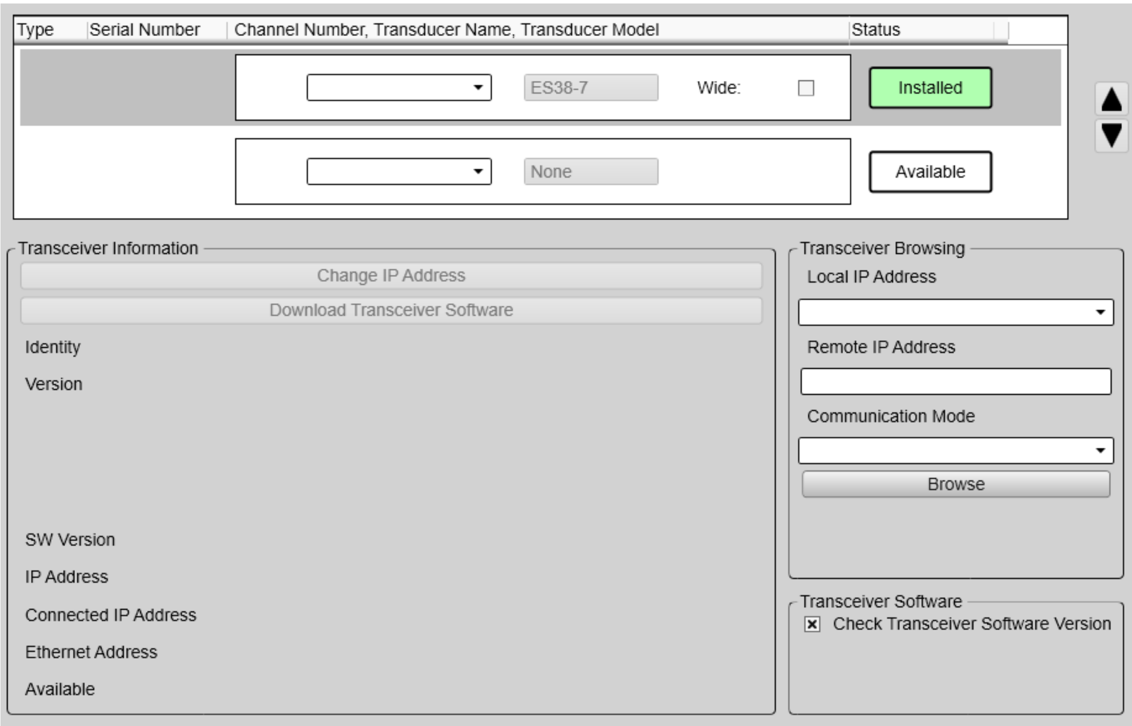
  The **Transceiver Browsing** parameters are used when you wish to start an automatic search for transceivers on the network.

  The communication is made between the Processor Unit (identified with its Local IP Address) and one or more transceivers. To search your network for transceivers, check that the correct IP address of the Ethernet adapter in the Processor Unit is shown, select **Browse** and then **Apply**. All transceivers connected to the Processor Unit through the network are automatically listed in the **Frequency Channels** list. The current status for each channel is also provided.

  At the bottom of the **Transceiver Browsing** field, you can set up the EK80 to automatically scan for new transceiver software versions. Software updates are only available if and when distributed with the EK80 operational software.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*



Details: Transceiver Channels

The list in the upper part on the **Transceiver Installation** page shows you an overview of the transceivers and channels that are currently available. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Type (of transceiver)

This information identifies the type of transceiver in use and/or currently available for the EK80.

- "GPT" identifies the "General Purpose Transceiver"
- "WBT" identifies the "Wide Band Transceiver"
- "SBT" identifies the "Single Band Transceiver"
- "WBT Mini" identifies the miniature wide band echo sounder transceiver
- "WBT Tube" identifies the subsea wide band echo sounder transceiver

Tip

This information is also found in the **BITE** *(Built-In Test Equipment) dialog box. You open the* **BITE** *dialog box from the* **Setup** *menu.*

Serial number

This is the serial number of the transceiver. This number is fixed and cannot be changed.

Tip

This information is also found in the **BITE** *(Built-In Test Equipment) dialog box. You open the* **BITE** *dialog box from the* **Setup** *menu.*

Channel number

Each transceiver may have one or more transducers connected. This digit identifies each of these transceiver/transducer channels. You can not change this information. If you use split-beam transducers, you will only have one transducer on each transceiver. The channel number will then always be one -1-.

Transducer Name

This column identifies the transducer that is connected to the transceiver. The name shown is the **Custom name** you defined when you added the transducer to the EK80 configuration using the **Transducer Installation** page.

When you set up the EK80 for use, select the transducer from the list.

Note

You can only select from the transducers that you have previously installed on the **Transducer Installation** *page.*

Transducer Model

The transducer model is identified. In most cases, this is the actual product name of the transducer. You are not able to change this information.

Status

The current status of the channel is shown.

- **Busy**: The channel is already in use, probably by another echo sounder on the same network. You cannot connect to this channel.
- **Installed**: This channel is connected to your EK80 system.
- **Lost**: This channel cannot be used.
- **Available**: This channel is vacant and ready for use.

Mux

In this context "Mux" means Multiplexer.

Certain transceivers for the EK80 support multiplexed outputs. When applicable, a tick box appears in the channel list to enable the multiplexing functionality.

Select the tick box to expand the channel listing to include the additional channels, transducer names and transducer models.

Note

Make sure that you have a clear understanding of which transducer that is connected to which output on the transceiver.

Details: Transceiver Information

The **Transceiver Information** group shows you the technical parameters for the Wide Band Transceiver (WBT) that is used on the chosen frequency channel. Select one of the items in the **Frequency Channels** list to see the information about the relevant Wide Band Transceiver (WBT). The information provided under **Transceiver Information** is not required for operational use.

Change IP Address

Each Wide Band Transceiver (WBT) is provided with a unique IP addresses created by the BOOTP server in the Processor Unit software. In most cases, this button is not used on the EK80.

However, if you are using a system with older General Purpose Transceiver (GPT) units, this function may be useful. The GPT units are provided from the factory with fixed Ethernet and IP addresses. If your EK80 uses two (or more) GPT units with identical frequencies, these will by default have different Ethernet addresses, but identical IP addresses. In order for your system to work, all GPT units must have unique IP addresses. The button opens the **IP Address** dialog box to accept the new address.

Download Transceiver Software

It is possible to update the software in the Wide Band Transceiver (WBT). This update is only necessary if new functionality in the EK80 software requires a newer software version. Software updates are only available if and when distributed with the EK80 operational software. The software release note provided will then include the necessary instructions.

Identity

This information reflects the type of transceiver connected. It also shows you the transceiver's unique Ethernet address.

- "GPT" identifies the "General Purpose Transceiver"
- "WBT" identifies the "Wide Band Transceiver"
- "SBT" identifies the "Single Band Transceiver"
- "WBT Mini" identifies the miniature wide band echo sounder transceiver
- "WBT Tube" identifies the subsea wide band echo sounder transceiver

Tip

The type of transceiver is also shown on the **Transceiver** *page in the* **BITE** *(Built-In test Equipment) dialog box. You open the* **BITE** *dialog box from the* **Setup** *menu.*

Version

This information includes the unique version parameters provided by the transceiver. Codes identifying frequency, serial number and firmware are shown.

SW Version

This is the software version currently running on the transceiver.

Tip

This information is also found in the **BITE** *(Built-In Test Equipment) dialog box. You open the* **BITE** *dialog box from the* **Setup** *menu.*

IP Address

This is the transceiver's current IP Address.

Connected IP Address

The Processor Unit holds an Ethernet adapter that is used to communicate with the transceiver(s). This is the IP address of that Ethernet adapter.

Ethernet Address

This is the Ethernet address (also known as the "media access control" address (MAC)) of the transceiver. This address is fixed, and it can not be changed.

Tip

Do not confuse "Ethernet address" (or MAC address) with "IP address".

A MAC address is a unique identifier assigned to network interfaces for communication on the physical network segment. MAC addresses are used as a network address for most IEEE 802 network technologies, including Ethernet.

An Internet Protocol address (also known as an IP address) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication. An IP address serves two principal functions: host or network interface identification and location addressing. Its role has been characterized as follows: "A name indicates what we seek. An address indicates where it is. A route indicates how to get there."

- Wikipedia, July 2014

Available

This parameter identifies if the selected frequency channel is currently available for use with the EK80. If it is available, the status is identified as *True*.

Details: Transceiver Browsing

The **Transceiver Browsing** parameters are used when you wish to start an automatic search for transceivers on the network.

The communication is made between the Processor Unit (identified with its Local IP Address) and one or more transceivers. To search your network for transceivers, check that the correct IP address of the Ethernet adapter in the Processor Unit is shown, select **Browse** and then **Apply**. All transceivers connected to the Processor Unit through the network are automatically listed in the **Frequency Channels** list. The current status for each channel is also provided.

Local IP Address

This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one Ethernet adapter, you are provided with a list of the available addresses.

Note

Every time you choose a new IP Address you must select **Apply**.

If you wish to connect the Processor Unit to the ship's network, you need two Ethernet adapters.

- Set up one adapter to communicate with the transceiver.
- Set up one adapter to communicate with the ship's local area network (LAN).

Remote IP Address

The **Remote IP Address** is the Internet Protocol (IP) address for a peripheral device. This peripheral device is the transceiver.

If you wish to locate a transceiver using *Point-to-Point* communication, type the IP Address for the transceiver you wish to communicate with. If you don't know the transceiver's IP Address, leave this field blank, and use *Broadcast* communication.

Note

This is a legacy setting.

Communication Mode

You can select *Broadcast* or *Point-to-point*.

Broadcast mode enables data to be sent from the EK80 to any number of peripheral devices. Data is only transmitted to these devices. *Point-to-point* mode implies that the EK80 Processor Unit is physically connected only to one single remote device. A complete two-way communication system is then established.

This peripheral device is the transceiver.

Use *Broadcast* if you do not know the Internet Protocol (IP) Address of the transceiver you are trying to locate.

Use *Point-to-Point* if you know the Internet Protocol (IP) Address of the transceiver. You must then type the this IP Address into the **Remote IP Address** box.

Note

This is a legacy setting.

Browse

This button initiates a search on the network for available transceivers. The transceivers that are found are automatically listed in the **Frequency Channels** with their appropriate status indicators.

Transceiver Software

At the bottom of the **Transceiver Browsing** field, you can set up the EK80 to automatically scan for new transceiver software versions. Software updates are only available if and when distributed with the EK80 operational software. The software release note provided will then include the necessary instructions.

Return to...

Installation dialog box, page 602

Transceiver pages, page 677

Transceiver IP Address page, page 686

Related tasks

Getting started, page 93

Installing transducers and transceiver channels in the user interface, page 294

Installing an ADCP transceiver in the user interface, page 308

Transceiver IP Address page

The **Transceiver Installation** parameters control the installation and disconnection of transceivers. If you have several transceivers in a large system, it may be useful to control the IP Addresses used to communicate with each transceiver. These IP Addresses are defined by a BOOTP server in the Processor Unit, and assigned to each Wide Band Transceiver (WBT).

Description

In order to establish communication between the Processor Unit and the transceiver(s), each transceiver must have unique Internet Protocol (IP) Address. The software in the Processor Unit includes a function ("Bootp server") that automatically defines and assigns one IP address to each transceiver.

Tip

The IP address of the Processor Unit can either be fixed, or automatically obtained from a network.

1. *In the bottom-left corner of your desktop, select the Windows® search function.*
2. *In the search box, type "Network Connections", and open the* **Network Connections** *dialog box.*
3. *Right-click the network adapter you are going to use and select* **Properties** *on the shortcut menu.*
4. *On the list of connections, select* **Internet Protocol 4 (TCP/IPv4)***, and then* **Properties***.*
5. *Obtain an IP address automatically, or specify a specific address for the Ethernet adapter.*

If you wish to connect the Processor Unit to the ship's network, you need two Ethernet adapters.

- *Set up one adapter to communicate with the transceiver. Specify a dedicated IP address.*
- *Set up one adapter to communicate with the ship's local area network (LAN). Obtain the IP address automatically.*

All the transceivers in the WBT family obtain their IP address from EK80. If you have changed the network settings, turn each transceiver off and on. EK80 automatically assigns an IP address to each transceiver when the transceiver is turned off and on.

The IP Address assigned to each transceiver will automatically use the same address range as the address given to the Processor Unit. If you are an advanced user, you can use the parameters provided to control these addresses.

Example

If you have set up your Processor Unit IP Address to 157.237.52.100, the IP Address(es) to the transceiver(s) will always start with 157.237. The **IP3** and **IP4** elements are chosen automatically within the ranges defined. If you have three transceivers, they may be provided with IP Addresses 157.237.52.101, 157.237.52.102 and 157.237.52.103.

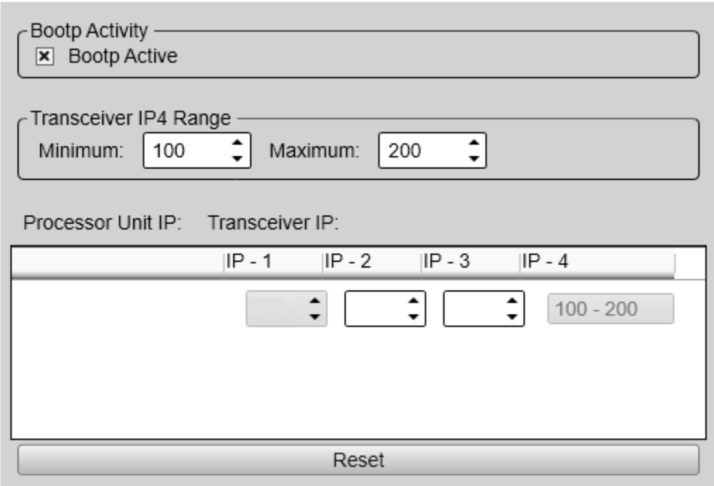
This functionality is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Details

Bootp Activity



The Wide Band Transceiver (WBT) is not provided with a fixed IP Address for Ethernet communication. This happens automatically when the transceiver is connected, since the Processor Unit software includes a Bootp configuration server. If you have several transceivers connected to your Processor Unit, each transceiver will automatically be assigned a unique IP Address.

Note

This automatic assignment of an IP Address to the transceiver will only work when **Bootp Active** *is enabled.*

The Bootstrap Protocol (BOOTP) is a computer networking protocol used in Internet Protocol networks to automatically assign an IP address to network devices from a configuration server. [...]

When a computer that is connected to a network is powered up and boots its operating system, the system software broadcasts BOOTP messages onto the network to request an IP address assignment. A BOOTP configuration server assigns an IP address based on the request from a pool of addresses configured by an administrator.

BOOTP is implemented using the User Datagram Protocol (UDP) as transport protocol, port number 67 is used by the server to receive client requests and port number 68 is used by the client to receive server responses. BOOTP operates only on IPv4 networks.

Wikipedia (https://en.wikipedia.org/wiki/Bootstrap_Protocol), April 2016

Transceiver IP4 Range

On large networks, you may wish to limit the range of the IP Address(es) provided to the individual transceiver(s). The **Transceiver IP4 Range** parameters allows you to define upper and lower limits for the fourth element in the IP Address(es). When you make a selection using the spin boxes, observe that the chosen limits are shown in **IP4** column in the table.

Note

This functionality is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

IP Address table

Use this table to define the IP address(es) provided to the transceiver(s).

- **IP-1** and **IP-2** are provided by the Processor Unit, and reflects the choices you made when you set up the Ethernet adapter.
- **IP-3** is chosen using the box.
- The **IP-4** range is selected using the **Transceiver IP4 Range** boxes.

Note

This functionality is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

Reset

Use this **Reset** function to restore all IP Address settings to their default values.

Return to...

Installation dialog box, page 602

Transceiver pages, page 677

Installation dialog box, page 602

Related tasks

Getting started, page 93

Sensor Installation page

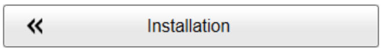
For the EK80 to use and offer correct navigational information, one or more external sensors must be connected. Typical sensors are those providing navigational information (heading, speed or geographical position). Use the **Sensor Installation** page to define which external sensors your EK80 will import information from. You must also specify which datagram formats to use. For each relevant sensor you must insert the offset values that define the its physical location relative to the vessel's coordinate system.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description

The **Sensor Installation** page allows your EK80 to communicate with external sensors and systems. The parameters are organized in groups.

- **Installed Sensors**

  The **Installed Sensors** list contains all the sensors that are currently installed on the EK80. Select a sensor in the list to edit its interface properties, or to remove it. Select **New** in the list to add a new sensor interface to the EK80.

- **Sensor**

  In the **Sensor** group you select which type of sensor you want to receive information from. You must specify which communication port to use (LAN (Local Area Network) or serial port). You can type a custom name to identify the sensor import. Select **Inspect Port** to verify that the communication parameters of the chosen port have been set up correctly.

- **Datagram**

  In the list of valid datagram formats, select the format(s) to be accepted by the EK80. If necessary, you can also specify a specific **Talker ID**.

- **Installation**

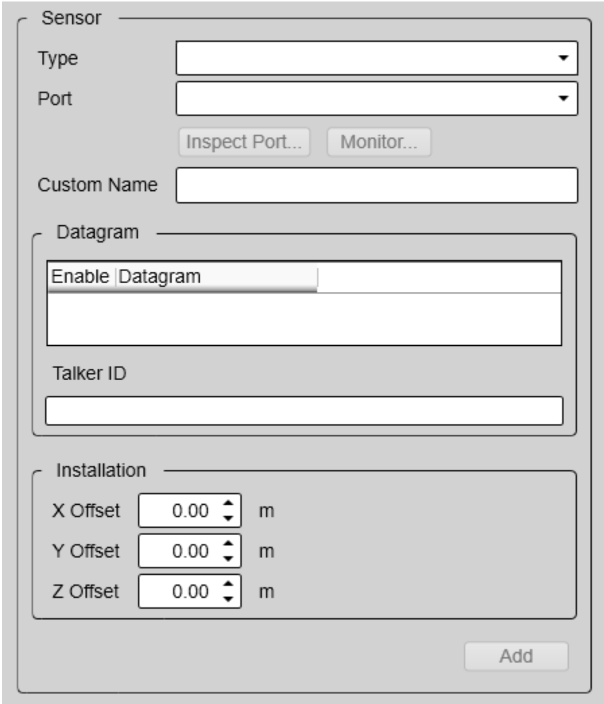
  Most sensors are physically mounted somewhere on your vessel. For accurate measurements, the sensor locations - referenced to the vessel's coordinate system - must be known to the EK80.

Note

Just making changes and selecting **OK** *at the bottom of the page will not install anything. Select what to install, define the relevant parameters, and then select* **Add**.

A summary of all the sensors that are connected to the EK80 is provided in the **BITE** (Built-In Test Equipment) dialog box.

Details



Installed Sensors

The **Installed Sensors** list contains all the sensors that are currently installed on the EK80. Select a sensor in the list to edit its interface properties, or to remove it. Select **New** in the list to add a new sensor interface to the EK80.

Type

The EK80 can communicate with several different sensor types. Use this list to select the sensor type you want to receive information from.

Tip

The **Sensors** *page in the* **BITE** *(Built-In Test Equipment) dialog box provides an overview of all the communication lines and sensors in use. All relevant status information is provided. You open the* **BITE** *dialog box from the* **Setup** *menu.*

Port

In order to import the data from the chosen sensor, you need to define an input port. This may be any available Local Area Network (LAN) or serial line on your Processor Unit.

We recommend that you set up the relevant communication parameters before you use the port. To set up the communication parameters, use the **I/O Setup** page. The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes.

Inspect Port

Select **Inspect Port** to check the communication parameters for the port. The relevant port setup dialog box opens.

The communication parameters defined for NMEA 0183 are:

- **Baud rate**: 4800 bit/s
- **Data bits**: 8
- **Parity**: Even
- **Stop bits**: 1

Some instruments may provide other parameters and/or options. You must always check the relevant technical documentation supplied by the manufacturer.

Note

You are not permitted to make any changes. To change the communication parameters, use the ***I/O Setup*** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

Monitor

This option is only available if you decided to edit the parameters of a previously installed sensor. Select **Monitor** to open the **Port Monitor** dialog box. The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line or LAN port.

Custom Name

For easier recognition of the sensor interface, you can type a custom name. This name is shown in other dialog boxes in the EK80 user interface. If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

Datagram

The list presents the available datagram formats for the chosen sensor type. Select the datagrams you want to import.

- When you select sensor type ITI-FS, only one datagram can be selected; ITI-FS Datagrams. This is a group of datagrams that allows the EK80 to import information from trawl systems.
- When you select sensor type PI50, only one datagram can be selected; PI50 Datagrams. This is a group of datagrams that allows the EK80 to import information from catch monitoring systems.

Talker ID

If you want to specify a dedicated Talker ID on the datagram format, it can be defined here.

Every NMEA datagram starts with a dollar sign. A "talker identifier" tag with two characters follows. This identifier is followed by three characters that define the type of message. The Talker ID identifies the system that sends the datagram. You may leave this box blank. This means that two blank characters are inserted into the datagram. You may also specify two characters that identifies the EK80 as the "sender". In most cases, you will only need to define a Talker ID if your receiving system needs it for specific purposes.

Example

`$ESDBT,x.x,f,y.y,M,z.z,F*hh<CR><LF>`

In this NMEA depth datagram, the Talker ID is "ES", which means "echo sounder".

Tip

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** *button to open an on-screen keyboard.*

Offsets

The physical location of each sensor must be defined with reference to the vessel's coordinate system.

The position of certain sensors must be defined as an *offset* to the *Ship Origin* in the coordinate system to maximize performance. These offset values are all required to allow the EK80 to give you as accurate information as possible. The degree of accuracy offered by the EK80 is directly related to the accuracy of the information you enter on the **Installation Parameters** pages.

- **X Offset**: Select the offset value on the X axis (fore-and-aft direction) from the *Ship Origin*. Adjust with a positive value for X if the sensor is located ahead of the ship origin.
- **Y Offset**: Select the offset value on the Y axis (athwartship) from the *Ship Origin*. Adjust with a positive value for Y if the sensor is located on the starboard side of the ship origin.
- **Z Offset**: Select the offset value on the Z axis (vertical) from the *Ship Origin*. Adjust with a positive value for Z if the sensor is located under the ship origin.

Rotation

For some sensors - typically motion sensors and transducers – the physical location of the sensor is not sufficient to extract accurate data. These sensors are installed with physical angles. These angles are often referred to as "installation angles" or "offset angles". The sensor can be rotated around the three axis of the vessel coordinate system.

- Rotation Around X (Roll)
- Rotation Around Y (Pitch)
- Rotation Around Z (Yaw)

In the EK80 user interface, you will only need to specify the installation angles when the parameters are shown.

- **Rotation Around X**: Specify an angle (in degrees) to compensate for any deviation from the X axis (fore-and-aft direction) in the coordinate system.
- **Rotation Around Y**: Specify an angle (in degrees) to compensate for any deviation from the y-axis (athwartship direction) in the coordinate system.
- **Rotation Around Z**: Specify an angle (in degrees) to compensate for any deviation from the Z axis (vertical direction) in the coordinate system.

Add

When you have set the parameters for a new sensor interface, select **Add** to save it. Once a sensor has been added to the EK80 configuration, it appears in the **Installed Sensors** list.

Remove

The **Installed Sensors** list contains all the sensors that are currently installed on the EK80. If you want to delete a sensor, select it in the list, and then select **Remove** at the bottom of the **Sensor Installation** page.

Note

You cannot undo this operation.

Edit

The **Installed Sensors** list contains all the sensors that are currently installed on the EK80. If you want to edit the parameters of a previously installed sensor, select it in the list, and then select **Edit** at the bottom of the **Sensor Installation** page.

Return to...

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Related dialog boxes

Sensors page, page 715

Port Monitor dialog box, page 754

Conceptual descriptions

Vessel coordinate system, page 761

Sensor Configuration page

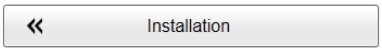
With several sensors connected to the EK80, many of them will provide the same datagrams. We cannot expect that the datagrams provide the same information. The **Sensor Configuration** page allows you to define a datagram priority, so that the information from the "most reliable" sensor is used by the EK80. You can also define manual values in case a sensor is unserviceable, or not installed.

Prerequisites

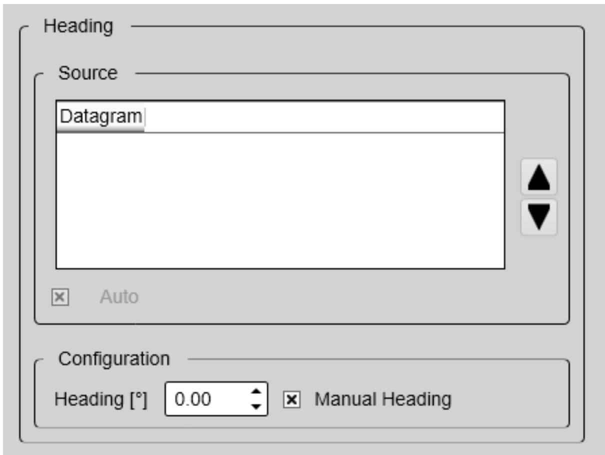
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description



When the EK80 communicates with peripheral devices (for example navigation sensors), the information is contained in datagrams.

The term "datagram" has been defined as follows:

> A self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network.
>
> *https://tools.ietf.org/html/rfc1594, April 2016*

The majority of the datagrams used by the EK80 are defined by the National Marine Electronics Association (NMEA). Other proprietary datagrams are defined by third-party organizations or by Kongsberg Maritime.

Any information in a datagram, for example the current depth, may be provided in different datagrams from several sensors. Due to a number of reasons (environmental conditions, installation, configuration, accuracy, etc.), the numerical values provided can be different from one sensor to another.

Several sensor are provided on the **Sensor Configuration** page, one for each type of information. Select the sensor you wish to configure in the **Sensor** list. For each type, you can define a priority sensor by rearranging the datagrams in a list. You can also define manual values in case a sensor is unserviceable, or not installed.

Tip

The EK80 can communicate with several different sensor types. Use the **Sensor Installation** *page to define which external sensors your EK80 will import information from. You must also specify which datagram formats to use. The* **Sensor Installation** *page is located in the* **Installation** *dialog box.*

A summary of all the sensors that are connected to the EK80 is provided in the **BITE** *(Built-In Test Equipment) dialog box.*

When you save echo data in RAW format, all sensor data are included.

Note

If you have two sensors providing the same information, but on different communication ports, certain limitations apply. During normal operation, you can easily decide which sensor you wish to use. During replay, you can only play back from one of these sensors. For this reason, only the information from the currently "active" sensor is saved.

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Details

Sensor

All the sensors are listed. Select a sensor in this list to set up the datagram priority and/or configuration.

Source

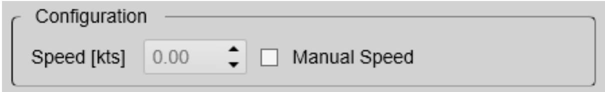
All the datagrams that have been selected for input data are shown in this list. To change the priority for a given datagram, select it, and change its location on the list using the arrow buttons.

Auto

Select **Auto** to control the functionality.

- With **Auto** *enabled*, the priority list is used. Information is imported from the sensor at the top of the list. If the sensor fails to provide information for more than 20 seconds, data from the next sensor is used.
- With **Auto** *disabled*, the priority list is not used. Information is imported from the sensor at the top of the list. All other sensors are ignored.

Configuration



On most of the pages you can specify a manual value. Use this function if a sensor is unserviceable or not installed. Click to enable this function, and select or type the requested value.

When you select the *Time* sensor, you can set the ZDA datagram to synchronize the internal clock in the Processor Unit. To do this, you need administrative privileges on your Processor Unit.

Return to...

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Related dialog boxes

Sensor Installation page, page 689

Sensors page, page 715

Synchronization page

The purpose of the **Synchronization** parameters is to set up the EK80 to operate alone, or as a master or slave in a synchronized system. Synchronization is required in order to avoid interference if the EK80 is used simultaneously with other hydroacoustic instruments within the same frequency range.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.

Description

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid interference, you have these options:

- The systems are all connected to a common synchronization system.
- One of the acoustic systems is set up as "master", and controls the transmissions on the other systems.

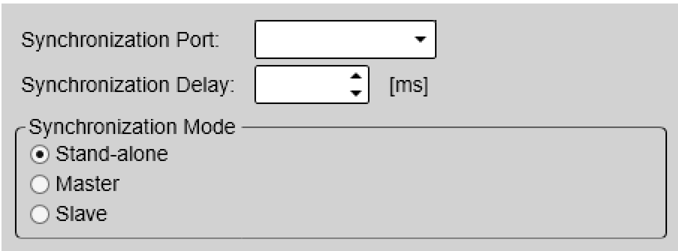
The EK80 offers functionality for remote transmit synchronization. It can be set up to operate in either *Master* or *Slave* mode.

> In physics, interference is the phenomenon in which two waves superpose each other to form a resultant wave of greater or lower amplitude. Interference usually refers to the interaction of waves that are correlated or coherent with each other, either because they come from the same source or because they have the same or nearly the same frequency. Interference effects can be observed with all types of waves, for example, light, radio, acoustic, surface water waves or matter waves.
>
> *https://en.wikipedia.org/wiki/Interference_(wave_propagation), April 2016*

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Details



Synchronization Mode

Choose which synchronization mode to use.

For "slave" operation, a remote system (for example *K-Sync* or *Simrad TU40*) must be available to provide trigger pulses.

For "master" operation, a remote hydroacoustic system (sonar, echo sounder) is connected. This remote system must be set up in "slave" mode.

- *Stand-alone*

  Synchronization is turned off.This synchronization mode is used if the EK80 is working by itself and with no synchronization required. This is the default setting. The EK80 operates using its internal ping interval parameters, independent of any trigger signals arriving at the synchronization port.

  The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  Master mode is used if the EK80 is going to act as the controlling unit in a synchronized system. The peripheral hydroacoustic system(s) are only permitted to transmit when enabled by the EK80. When *Master* mode is selected, the EK80 will run using its internal ping interval parameters and send trigger signals to the peripheral system(s).

  This mode is unavailable if you set **Synchronization Port** to *Transceiver Auxiliary Port*.

- *Slave*

  Slave mode is used if the EK80 is going to transmit only when permitted by a peripheral system. When *Slave* mode is selected, the EK80 does not transmit ("ping") unless an external trigger appears on the chosen synchronization port. The peripheral system may be any other hydroacoustic product (for example an echo sounder or sonar), or even a dedicated synchronization system.

The synchronization mode is not fixed. It can be changed at any time during EK80 operation.

Note

Simultaneous transmission of more than one hydroacoustic system can only take place if the systems operate with different frequencies.

Synchronization Delay

This delay parameter is used differently depending on the chosen synchronization mode.

- *Stand-alone*

  The **Synchronization Delay** setting is not applicable when synchronization is switched off.

- *Master*

  In *Master* mode, the EK80 waits for the delay time after the external trigger signal has been sent to the slaves before transmitting the ping. This is often referred to as a *pre-trigger*.

  Note

  This delay will only work when the synchronization is set up using a serial port.

- *Slave*

  In *Slave* mode, the EK80 waits for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as a *post-trigger*.

Note

The **Synchronization Delay** *functionality is unavailable if you use the* AUXILIARY *port on your Wide Band Transceiver (WBT) to synchronize the EK80.*

Synchronization Port

This is the interface port currently used to transmit or receive synchronization signals. It can be a serial port or a connection using the Auxiliary socket on the Wide Band Transceiver (WBT). Since the synchronization function only uses the *Request To Send (RTS)* and *Clear To Send (CTS)* signals on a serial port, you can use a port that is already used for other purposes. For the same reason, you do not need to define any baud rate.

Note

If you use more than one Wide Band Transceiver (WBT) in your EK80 system, all synchronization input signals to the Auxiliary ports must be provided by the same source. Individual synchronization of a single Wide Band Transceiver (WBT) is not supported.

If you use more than one computer in your EK80 system, the synchronization inputs to the Auxiliary ports can not be used. This functionality is not supported.

If you use the trigger functionality provided by the Auxiliary connector the Wide Band Transceiver (WBT), the EK80 can not operate in Master mode. This function is not supported by the EK80.

Return to...

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Concept descriptions

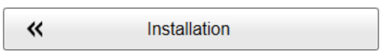
Setting up the EK80 in a synchronized system, page 318

Units page

The EK80 user interface presents many measurements. These measurements are for example related to depth, range and distance. From the **Units** page you control which units of measurements that are used.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description

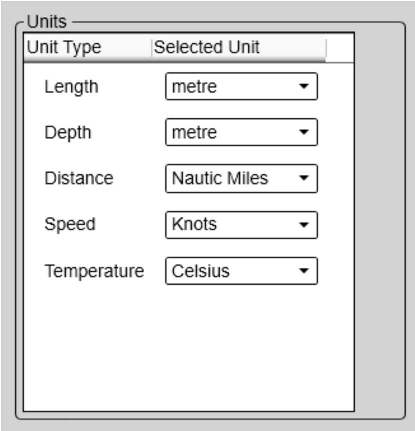
The EK80 is prepared to work with several international standards for units of measurements.

Use the **Units** options to select the units of measurements you want to work with. The EK80 uses them in all presentations. You only need to define them once. Use the drop-down lists provided to make the selections.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

Details



Length

Choose the unit of measurement for all the readouts related to range and distances in the EK80 user interface. This may for example be the cursor location.

Depth

Choose the unit of measurement for all the presentations of depth. This may for example be the current water depth.

Distance

Choose the unit of measurement for all presentations of sailed distance.

Speed

Choose the unit of measurement for all the presentations of vessel speed.

Temperature

Choose the unit of measurement for all the temperature readings. This may for example be the current water temperature, but only if you have a suitable sensor connected to the EK80.

Return to...

Installation dialog box, page 602

Related tasks

Defining settings related to user preferences and individual customizing, page 245

Trawl page

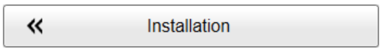
When you use a trawl, the EK80 can draw the upper and lower trawl lines in the echogram. In order to this, the EK80 needs to know the relevant trawl parameters. If your trawl system is connected to the EK80, these parameters are automatically available. If the trawl system is not connected, the **Trawl** options allow you to define the parameters manually.

Prerequisites

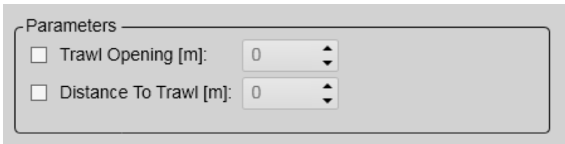
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description



A Simrad ITI (Integrated Trawl Instrumentation) system can be connected to the EK80. Communication with the ITI system is based on both NMEA and proprietary telegrams, and all necessary parameters are automatically defined. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram.

If another trawl or catch monitoring system is used, and this system does not provide the trawl opening and/or trawl distance automatically, the values must be entered manually.

When you record raw data, all the data received from the trawl system are saved to the file.

Tip

To connect and set up the actual interface, use the **Sensor Installation** *page. The* **Sensor Installation** *page is located in the* **Installation** *dialog box.*

To set up the communication parameters between the trawl or catch monitoring system and the EK80, use the **I/O Setup** *page. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Details

Trawl Opening

Select **Trawl Opening** to enter data manually. Use the spin box to provide the height of the trawl opening.

Distance to Trawl

Select **Distance to Trawl** to enter data manually. Use the spin box to provide the distance from the vessel to the trawl.

Return to...

Installation dialog box, page 602

Related tasks

Setting up the echogram presentation, page 151

Interfacing peripheral equipment, page 268

Related dialog boxes

I/O Setup page, page 636

Sensor Installation page, page 689

Lines page, page 732

Annotations page

When you study an echogram, it is often useful to add personal comments to it. Comments can be used to identify specific events such as specific echoes, unusual bottom conditions, or simply for keeping track of time or distance. The **Annotations** choices allow you to type comments and annotations into the echograms. The comments are automatically saved when you enable raw data recording.

Prerequisites

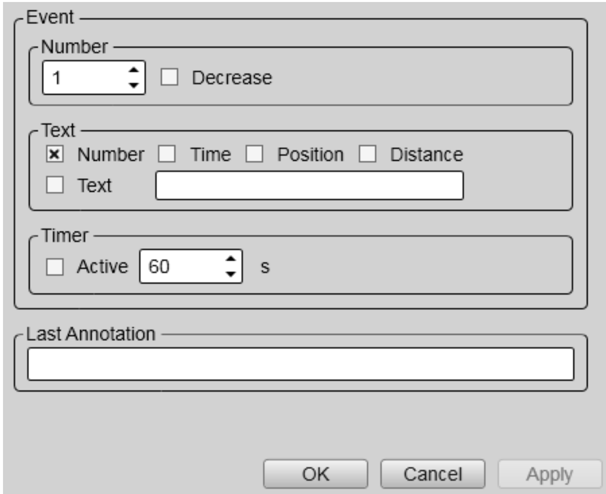
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open, select it on the **Setup** menu.

Description

The **Lines** page in the **Echogram** dialog box allows you to enable or disable annotations in the echograms. Several different annotation types may be added to the echograms or other views. They are displayed on the views if this annotation feature is enabled. Annotations can only be added to views while in *Normal* operational mode.



When you save raw data, the annotations you have defined are stored as annotation datagrams.

Note

When you work in the **Installation** *dialog box, you must always select* **Apply** *to save the changes made on a page. You must do this before you continue working on a different page.*

You can add annotations manually, or import information as datagrams using a serial or LAN (Ethernet) communication port. To connect and set up the actual interface, use the **Sensor Installation** page. The **Sensor Installation** page is located in the **Installation** dialog box. To set up the communication parameters, use the **I/O Setup** page. The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes.

Tip

Sometimes it can be useful to place a single written comment on the echogram. The **Manual Annotation** *dialog box offers that function. Type a text string. Select* **OK** *in the dialog box to add the text to your echogram. The* **Manual Annotation** *dialog box is opened from the* **Setup** *menu*

Details

Event

The **Event** parameters initiate annotations whenever something happens. Events may be triggered by external devices, set by a timer, or initiated by selecting the **Event** button on the top bar.

Number

All events are identified with a number. This number can be included in the annotation string.

Using this feature, you can manually select the next number to be used, and you can choose to have the number series decrease instead of increasing.

Text

Use the options in this group to select which items to be included in the event generated annotation string. You can also add a text string to be included at every event annotation.

If you do not have a computer keyboard connected to your EK80 system, select the **Keyboard** button to open an on-screen keyboard.

Timer

Set a time period for automatic generation of events.

Latest annotation

This text box automatically displays the latest annotation text that was typed.

Supported datagram formats for annotation data

The EK80 supports the following datagram format for annotations.

- **Simrad ATS datagram format**

  Simrad ATS is a proprietary datagram format created by Kongsberg Maritime. It allows you to import annotations from external devices.

Return to...

Installation dialog box, page 602

Related tasks

Setting up the echogram presentation, page 151

Setting up the ADCP presentation, page 212

Interfacing peripheral equipment, page 268

Related topics

Event button description, page 452

Related dialog boxes

Manual Annotation dialog box, page 596

Remote Control page

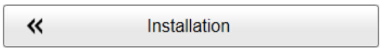
The EK80 can be set up to operate as a "sensor" in a larger scientific system. Everything the EK80 do is then remotely controlled from another computer on the local area network (LAN). The **Remote Control** settings allow you to set up remote controlled operation. You define how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this and other systems.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description

The EK80 Wide band scientific echo sounder allows you subscribe to echo data and to control the operation from your own remote application. In this way you can create your own software for controlling the EK80 operations. Such operations may for example include start/stop pinging, changing ping interval, or start/stop data recording.

Note

In this context the EK80 Processor Unit is regarded as the "server". The EK80 program is the "server application". The program you make yourself for running on a local computer is referred to as the "client application".

The **Remote Control** parameters are located on three pages in the **Installation** dialog box.

- **Application Information**

  With the **Application Information** parameters you can control and monitor system-specific information. This is typically the name (EK80) and type of your product ("server"), as well as a an identification number.

  Remote Control: Application Information page, page 706

- **As Server**

  You use the **As Server** parameters if you want to set up the EK80 Processor Unit as a server for client applications. A computer is installed somewhere else on the vessel to monitor - and control - the EK80 operations using a client application.

  Remote Control: As Server page, page 707

Return to...

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Remote Control: Application Information page

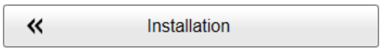
With the **Application Information** parameters you can control and monitor system-specific information. This is typically the name (EK80) and type of your product ("server"), as well as a an identification number.

Prerequisites

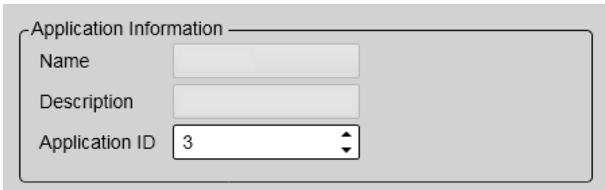
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description



The **Application Information** parameters include the product name and description, as well as an identification number. Only the identification number can be changed; the other parameters are fixed.

Details

Name

This is the name of your product (EK80). The name is fixed, and you cannot change it.

Description

This is the type of product you are operating. The description is fixed, and you cannot change it.

Application ID

In this box you can provide a number. The number is used to recognize your EK80 system in the larger network.

Return to...

Remote Control page, page 705

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Remote Control: As Server page

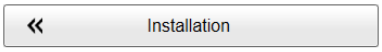
You use the **As Server** parameters if you want to set up the EK80 Processor Unit as a server for client applications. A computer is installed somewhere else on the vessel to monitor - and control - the EK80 operations using a client application.

Prerequisites

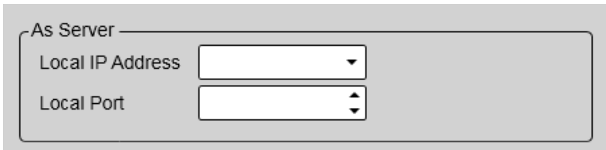
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description



If you have two network adapters in your Processor Unit we strongly suggest that you:

- Use the first network adapter for communication with the transceiver.
- Use the second network adapter for data transfer between the server (your EK80 Processor Unit) and clients (peripheral computers in the network).

The two network adapters are then connected to two different networks.

Specify network adapter for server functionality by selecting the relevant IP address from the list. The initial connection between a server and a client is created through a specific user datagram protocol (UDP) port number on the server. When the connection is established, data communication is transferred to a new UDP port number that is automatically assigned by the server. The default local port number for the initial connection can be changed if you want to use a specific local port number. Normally this is not necessary.

Details

Local IP Address

This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one Ethernet adapter, you are provided with a list of the available addresses.

Local Port

The **Local Port** is important if you want to receive information from a peripheral device to your the Processor Unit. The number you define here must match the port number on the peripheral device that is providing the information. This peripheral device is another computer on a local area network (LAN). To find the port number on the peripheral device, consult the documentation for the device, and/or the application to be used on it.

If the data communication is set up to only export information from the Processor Unit to a peripheral device, this **Local Port** parameter is not required.

Return to...

Remote Control page, page 705

Installation dialog box, page 602

Related tasks

Interfacing peripheral equipment, page 268

Client Server Configuration page

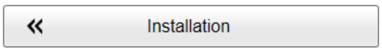
By means of the EK80 Client application, you can monitor the survey operations made on the EK80. The necessary settings required to allow the client to communicate with the EK80 are defined on this page.

Prerequisites

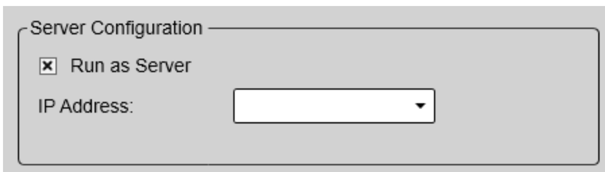
The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open the page, select **Installation** on the **Setup** menu.



Description



The communication between the EK80 Client application and the EK80 can be made using the vessel's local area network.

In this context the EK80 Processor Unit is regarded as the "server". The computer that runs the EK80 client application is the "client".

To establish the communication, the Client computer must know the Ethernet address of the Server computer.

Details

Run as Server

Select this check box to enable the EK80 to run in *Server* mode.

This mode does not have any effect on the EK80 operation and functionality. It simply allows the Client computer to connect.

IP Address

This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one Ethernet adapter, you are provided with a list of the available addresses.

Choose which Ethernet adapter you will use on the Processor Unit to communicate with the Client computer. When the EK80 Client application starts, this Ethernet address will appear in the opening dialog box, and you can establish contact.

Return to...

Installation dialog box, page 602

Related tasks

Setting up the echogram presentation, page 151

Software License page

The EK80 needs one or more software licenses to work. Each software license code "unlocks" one Wide Band Transceiver (WBT) for operational use with a set of predefined properties. The **Software License** settings allow you to type a license code (text string) to unlock the EK80 functionality.

Prerequisites

The **Installation** dialog box is not available when your EK80 is set to *Replay* mode.

How to open

This page is located in the **Installation** dialog box. To open, select it on the **Setup** menu.

Description

The software license is a 32 character hexadecimal string based on the transceiver’s serial number. It defines several key parameters that control the functionality and behaviour of the transceiver(s) you use. Each software license code "unlocks" one Wide Band Transceiver (WBT) for operational use with a set of predefined properties.

The software license is not linked to the physical Processor Unit. You can therefore easily move the software from one computer to another, just remember to make a copy of the license string.

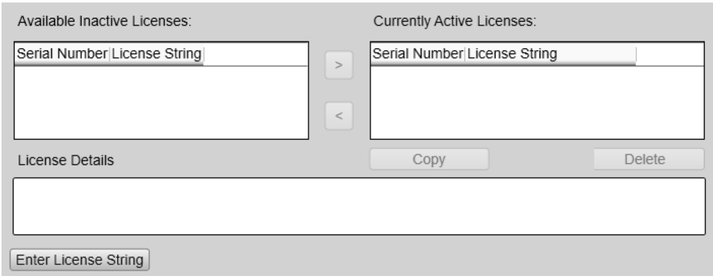
In order to obtain a software license you must contact a Simrad dealer or distributor. You can also use the request form on https://www.simrad.com/support, or contact our support department directly.

Note

Once you receive your software license string(s), do not lose them. We suggest that you copy the information into a text file (for example Notepad), and add relevant information. Place the text file on the Processor Unit desktop, and make sure that backup copies are made.

When you work in the **Installation** dialog box, you must always select **Apply** to save the changes made on a page. You must do this before you continue working on a different page.

Details



Available Inactive Licenses

This list shows all the EK80 software licenses that you have typed in, but that your are not using. To activate one of the licenses, select it, and click the arrow button [>]. To see the operational parameters contained by a license, select it, and see the information in the **License Details** box.

Current Active Licenses

This list shows you the EK80 software licenses that you have currently activated on your Processor Unit. To deactivate a license, select it, and click the arrow button [<]. To see the operational parameters contained by a license, select it, and see the information in the **License Details** box.

Copy

Select a license code, and then click **Copy** to copy the code to the operating system’s clipboard. From the clipboard you can paste the code into a text editor, for example Notepad.

Delete

Select a license code, and then click **Delete** to remove it from the Processor Unit.

License Details

This list contains an overview of the functionality available with the currently selected license code. To see the operational parameters contained by a license, select it, and see the information in the **License Details** box.

The following license parameters are listed.

- The serial number for the transceiver(s) in use
- The product name (EK80)
- The application
- The license type and expiry date (if any)
- The type of transducer(s) that can be used
- The type of transceiver(s) in use
- The transceiver channel(s) that can be used for the permitted transducer(s)

Depending on the type of system that the license has been created for, one or more channels are available. Each is defined with a channel number, a frequency range and the power output capacity. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency. Each *channel* is connected to one single transducer. The transducer can be fitted with one or more *sectors* depending on the transducer type (single or split beam).

Enter License String

Select **Enter License String** to open the dialog box. Type the license code.

You do not need to type the string manually. You can copy the code using the **Ctrl-C** and **Ctrl-V** keyboard combination, or right-click the mouse to use **Copy** and **Paste**.

Return to...

Installation dialog box, page 602

Related tasks

Installing and maintaining software, page 329

Pages in the BITE dialog box

The EK80 is a computerized Wide band scientific echo sounder. There are hardly any analogue circuitry, and the possibility of traditional troubleshooting is limited. In order to rectify this, a built-in software application is available to offer test and maintenance functionality. The **BITE** (Built-In Test Equipment) dialog box controls the test and diagnose program that checks the performance of the EK80.

How to open

This dialog box is opened from the **Setup** menu.

Description

By means of the **BITE** (Built-In Test Equipment) functionality, you can easily determine if the EK80 hardware is operational. And most important, you can make sure that all the transceivers channels and the transducer elements are functional. To open the different pages in the **BITE** (Built-In Test Equipment) dialog box, use the large "buttons" on the left hand side.

Each button provides a small colour coded indicator.

- **No indicator**: Status is OK. No actions are necessary.
- **Yellow**: This is a warning. A closer investigation is recommended.
- **Red**: This is an alarm. A closer investigation is required.
- **Grey**: No information is available.

The **BITE** (Built-In Test Equipment) dialog box and functionality is only provided for performance monitoring. The functionality is not required for normal use of the EK80. The **BITE** dialog box does not permit you to change any operational parameters.

Topics

Processor page, page 713

Sensors page, page 715

Transceiver page, page 716

Transducer page, page 718

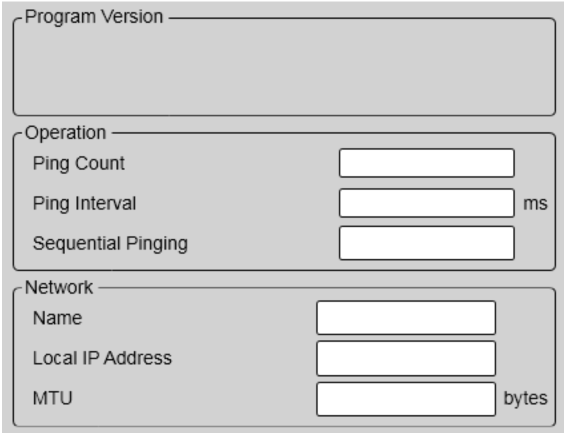
Noise page, page 720

Processor page

The **Processor** page offers an overview of the parameters related to software version, operation and network.

How to open

This page is located in the **BITE** dialog box. You open the **BITE** dialog box from the **Setup** menu.



Description

The information on the **Processor** page is offered in groups.

- **Program Version**

  This information is also found in the **About** dialog box.

- **Operation**

  This group offers generic information related to operational parameters.

- **Network**

  Some EK80 end users connect the Processor Unit to their local area network (LAN). This group offers generic information about this network. If the Processor Unit is not connected to a local network, these boxes are empty.

Details

Program Version

Every EK80 software release is uniquely identified. The version described in this Reference Manual is 2.0.0. This information is also found in the **About** dialog box. The **About** dialog box is located on the **Setup** menu.

Tip

If you wish to find the latest software version for the EK80, check our website.

- *https://www.simrad.com*

Operation

This group offers generic information related to operational parameters.

- **Ping Count**

  This function is simply a consecutive count of transmissions ("pings") since the EK80 was powered up and started.

- **Ping Interval**

  The *ping interval* (1/ping repetition frequency (PRF)) is the ping rate measured in time between each transmission.

  The phrase *ping rate* is used to describe the parameter that controls how often the EK80 can or shall transmit acoustic energy (a "ping") into the water. The ping rate is normally limited by the maximum range settings. It will also be dependant on hardware issues. This may be, for example, how fast your Processor Unit can handle the information from each ping, how fast your system communicates with external peripherals, or how long time the system uses to save data.

- **Sequential pinging**

  The **Sequential pinging** function can be used if you have more than one channel in use on the EK80. When activated, each individual transceiver will transmit ("ping") in sequence, one by one. When not activated, all transceivers will "ping" simultaneously.

Network

Some EK80 end users connect the Processor Unit to their local area network (LAN). This group offers generic information about this network. If the Processor Unit is not connected to a local network, these boxes are empty.

- **Name**

  This text box reflects the name of the local area network (LAN).

- **Local IP Address**

  This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets.

- **MTU (Maximum Transmission Unit)**

  The **MTU (Maximum Transmission Unit)** value reflects the maximum size of the data packets that can be transferred on the Ethernet line to and from the local area network (LAN).

  > In computer networking, the *maximum transmission unit (MTU)* of a communications protocol of a layer is the size (in bytes or octets) of the largest protocol data unit that the layer can pass onwards. MTU parameters usually appear in association with a communications interface (NIC, serial port, etc.). Standards (Ethernet, for example) can fix the size of an MTU; or systems (such as point-to-point serial links) may decide MTU at connect time.
  >
  > *https://en.wikipedia.org/wiki/Maximum_transmission_unit (April 2016)*

Return to...

BITE (Built-In Test Equipment) dialog box, page 604

Related dialog boxes

Normal Operation dialog box, page 572

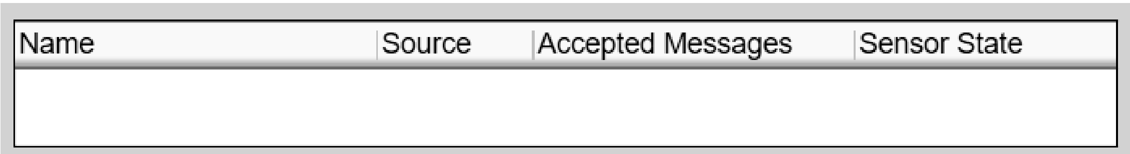
About dialog box, page 605

Sensors page

The **Sensors** page presents a table with all the sensors currently connected to the EK80. For each sensor, the status is provided.

How to open

This page is located in the **BITE** dialog box. You open the **BITE** dialog box from the **Setup** menu.



Description

For the EK80 to use and offer correct navigational information, one or more external sensors must be connected. Typical sensors are those providing navigational information (heading, speed or geographical position). A motion sensor (motion reference unit) can also be connected.

Each sensor that is connected to the EK80 for input or output purposes is listed. All relevant status information is provided.

Tip

Use the **Sensor Installation** *page to define which external sensors your EK80 will import information from. The* **Sensor Installation** *page is located in the* **Installation** *dialog box. The* **Installation** *dialog box is located on the* **Setup** *menu.*

The **Sensor Configuration** *page allows you to define a datagram priority, so that the information from the "most reliable" sensor is used by the EK80. You can also define manual values in case a sensor is unserviceable, or not installed. The* **Sensor Configuration** *page is located in the* **Installation** *dialog box.*

The **I/O Setup** *settings allow you to control the properties of each of the available communication ports. The* **I/O Setup** *page is located in the* **Installation** *and* **Output** *dialog boxes.*

Return to...

BITE (Built-In Test Equipment) dialog box, page 604

Related dialog boxes

I/O Setup page, page 636

Sensor Installation page, page 689

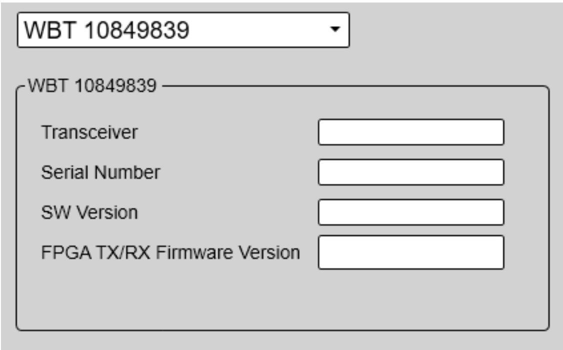
Sensor Configuration page, page 694

Transceiver page

The EK80 can be set up to work with one or more transceivers. The **Transceiver** page offers key information about each transceiver in use by the EK80.

How to open

This page is located in the **BITE** dialog box. You open the **BITE** dialog box from the **Setup** menu.



Description

Each transceiver is identified by its serial number. Select transceiver from the list. Only static information is provided.

Tip

The ***Transceiver Installation*** *parameters control the installation and disconnection of transceivers. An overview of the available transceivers is shown. As permitted by the software license, you can assign any transducer to any Wide Band Transceiver (WBT). The* **Transceiver Installation** *page is located in the* **Installation** *dialog box. The* **Installation** *dialog box is located on the* **Setup** *menu.*

The Transceiver Power Supply information pane shows you the current supply voltage provided to the transceiver.

Details

Select Transceiver

Use the spin box to select which transceiver you wish to investigate.

Transceiver

This information reflects the type of transceiver connected.

- "GPT" identifies the "General Purpose Transceiver"
- "WBT" identifies the "Wide Band Transceiver"
- "SBT" identifies the "Single Band Transceiver"
- "WBT Mini" identifies the miniature wide band echo sounder transceiver
- "WBT Tube" identifies the subsea wide band echo sounder transceiver

Tip

This information is also found on the **Transceiver Installation** *page. The* **Transceiver Installation** *page is located in the* **Installation** *dialog box.The* **Installation** *dialog box is located on the* **Setup** *menu.*

Serial Number

This is the serial number of the transceiver. This number is fixed and cannot be changed. This information is also found on the **Transceiver Installation** page.

SW Version

This is the software version currently running on the transceiver. This information is also found on the **Transceiver Installation** page.

FPGA TX/RX Firmware version

This information includes the unique version parameters provided by the transceiver. Codes identifying frequency, serial number and firmware are shown. This information is also found as **Version** on the **Transceiver Installation** page in the **Installation** dialog box.

> A field-programmable gate array (FPGA) is an integrated circuit designed to be configured by a customer or a designer after manufacturing – hence "field-programmable". The FPGA configuration is generally specified using a hardware description language (HDL), similar to that used for an application-specific integrated circuit (ASIC).
>
> FPGAs contain an array of programmable logic blocks, and a hierarchy of reconfigurable interconnects that allow the blocks to be "wired together", like many logic gates that can be inter-wired in different configurations. Logic blocks can be configured to perform complex combinational functions, or merely simple logic gates like AND and XOR.
>
> In most FPGAs, logic blocks also include memory elements, which may be simple flip-flops or more complete blocks of memory.
>
> *https://en.wikipedia.org/wiki/Field-programmable_gate_array, August 2017*

Return to...

BITE (Built-In Test Equipment) dialog box, page 604

Related tasks

Using the information panes to collect data from the echoes, page 172

Maintaining the EK80, page 341

Related information panes

Transceiver Power Supply information pane description, page 488

Related dialog boxes

Installation dialog box, page 602

Transceiver Installation page, page 679

Transducer page

The EK80 can be set up to work with one or more transceivers. In turn, each transceiver is assigned one or more transducers. By means of the **Transducer** page, you can check the impedance of each transducer during normal operation. Any errors are then easily detected.

How to open

This page is located in the **BITE** dialog box. You open the **BITE** dialog box from the **Setup** menu.

Description

The transducer impedance is measured in real time during each transmission ("ping"). For CW transmissions, the impedance and phase values for each transducer sector are provided in a tabular format. For LFM transmissions, the results are shown in two plots.

An operational transducer element will have an impedance of approximately 75Ω ±40%. However, various transducers will have different values, and you need to check the relevant data sheet. Composite transducers have a relatively flat impedance curve. Older transducers with "ton-pilz" elements have a slightly higher impedance at the beginning of the ping. This is by design.

- If you measure ∞Ω (open circuit), you can assume that the transducer impedance transformer has broken, or that the cable is damaged.
- If you measure 0Ω (short), you can assume that either the transducer impedance transformer or the cable has shorted. You may also have a problem with salt water penetration.
- The transducer impedance is a complex value, and it has a phase. This phase should be as small as possible. A large phase means that you loose output power.

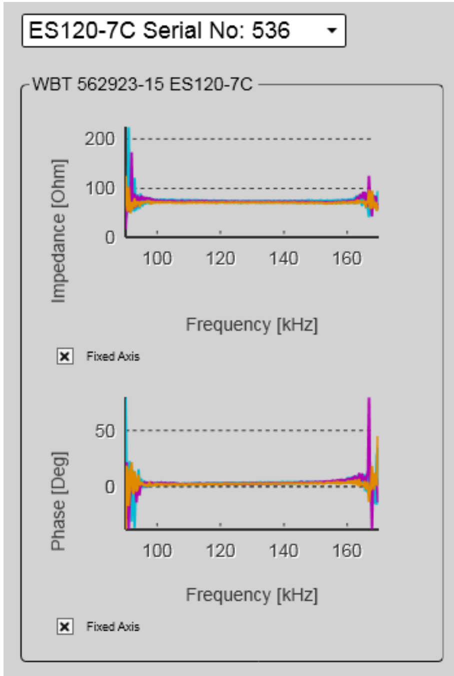
Tip

Each transducer is added using the **Transducer Installation** *page. The* **Transducer Installation** *page is located in the* **Installation** *dialog box. The* **Installation** *dialog box is located on the* **Setup** *menu.*

LFM transmissions

For LFM transmissions, the results are shown in two plots. One plot shows the impedance as a function of the frequency in one ping. The other plot shows the phase as a function of the frequency in the same ping.

In each plot, one coloured curve is provided for each transducer or transducer sector. A single beam transducer is shown with only one curve. A split beam transducer is shown with several curves, one for each sector.



Tip

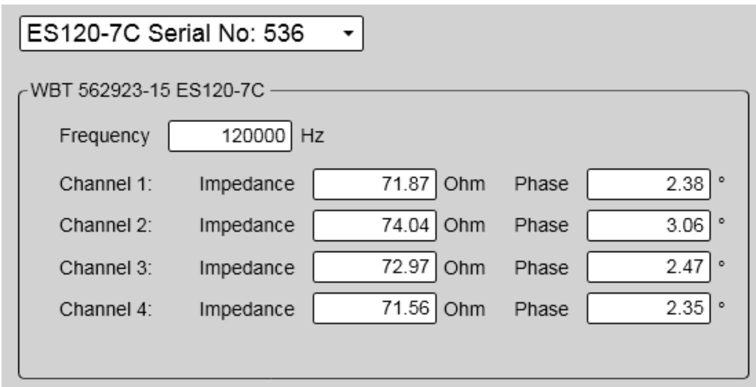
Select **Fixed Axis** *to make the curves easier to read. Pause the pinging to "freeze" the curves.*

If you wish to switch pulse type between CW and LFM, use the **Normal Operation** *dialog box. Before selecting LFM transmissions, make sure that your EK80 is provided with a compatible transducer!*

(The screen capture has been made while using a dummyload.)

CW transmissions

For CW transmissions, the impedance and phase values for each transducer sector are provided in a tabular format.



(The screen capture has been made while using a dummyload.)

Details

Select transducer

Use the spin box to select which transducer to study.

Frequency

This is the nominal centre frequency for the chosen transducer

Impedance

The transducer impedance is measured in real time during each transmission ("ping"). If you measure ∞Ω (open circuit), you can assume that the transducer impedance transformer has broken, or that the cable is damaged. If you measure 0Ω (short), you can assume that either the transducer impedance transformer or the cable has shorted. You may also have a problem with salt water penetration.

Phase

The transducer impedance is a complex value, and it has a phase. This phase should be as small as possible. A large phase means that you loose output power.

Fixed Axis

Select **Fixed Axis** to make the curves easier to read. Is is a visual function, it does not change the results from the measurements.

Return to...

BITE (Built-In Test Equipment) dialog box, page 604

Related tasks

Maintaining the EK80, page 341

Related topics

Rules for transducer handling, page 357

Approved anti-fouling paints, page 359

Related dialog boxes

Normal Operation dialog box, page 572

Installation dialog box, page 602

Transducer Installation page, page 673

Noise page

The operational performance of the EK80 Wide band scientific echo sounder depends on the noise conditions. It is essential that the noise signature is as low as possible.

How to open

This page is located in the **BITE** dialog box. You open the **BITE** dialog box from the **Setup** menu.

Description

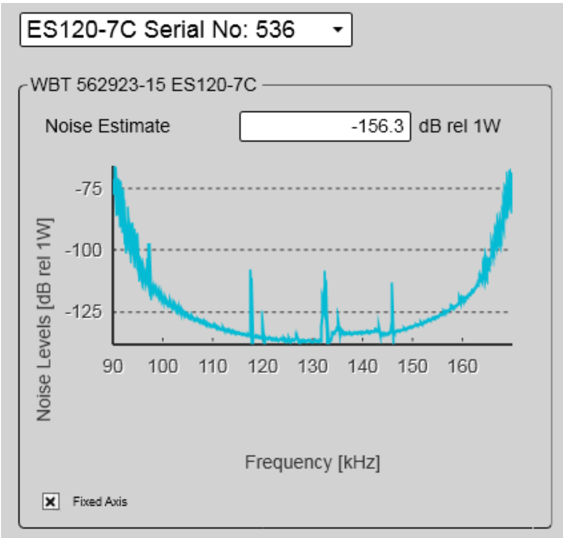
The **Noise** page provides information about the current estimated noise, and the equivalent ambient noise. Your EK80 must be set to *Passive* mode.

Tip

If you wish to switch to Passive mode, use the **Normal Operation** *dialog box. The* **Normal Operation** *dialog box is located on the* **Operation** *menu.*

LFM transmissions

When you work with LFM transmission, the noise is presented in a plot. The plot shows the noise level as a function of the transmission frequency. The noise estimated, in dB relative to 1W, is shown in a box.



Tip

Select **Fixed Axis** *to make the curves easier to read.*

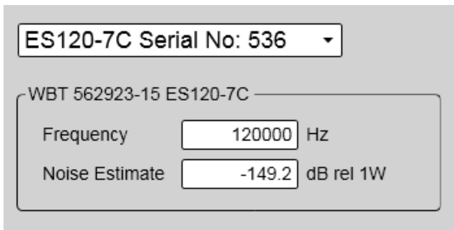
If you wish to switch pulse type between CW and LFM, use the **Normal Operation** *dialog box. Before selecting LFM transmissions, make sure that your EK80 is provided with a compatible transducer!*

(The screen capture has been made while using a dummyload.)

CW transmissions

When you work with CW transmissions, the noise is presented in text boxes.

(The screen capture has been made while using a dummyload.)

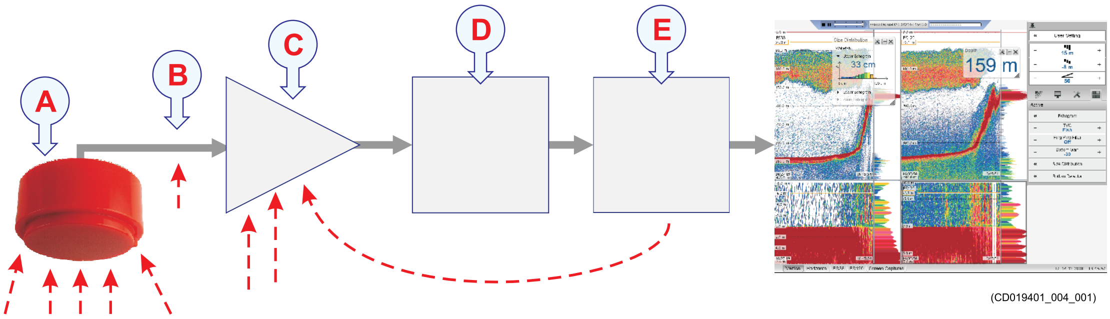


About noise

The noise that contributes to the signal to noise ratio may be divided into the following types of noise:

- Self noise
- Ambient noise
- Electrical noise
- Reverberation

- Fishing gear noise



(CD019401_004_001)

A The transducer can pick up noise from

- Biological disturbances
- Interference
- Cavitation
- Propeller noise
- Flow noise
- Acoustic noise from other hydroacoustic systems

B The transducer cable is long, and may pick up electric noise from generators, pumps, cooling systems and other electric or electromechanical devices.

C The preamplifiers are very sensitive, and they can easily pick up electrical noise from internal and external power supplies. The preamplifiers are also vulnerable to analogue noise created by their own electronic circuitry. Digital noise created by the converter and processing circuitry can also create problems.

D Converters transform the analogue echoes to digital format.

E Signal processing circuitry can create digital noise.

Details

Select channel

Use the spin box to select which channel to study. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Noise Estimate

For every transmission ("ping") the EK80 measures the echo levels along the chosen range. Typically, these measurements are made every five meters, even for long ranges.

All echoes and noise in the water are recorded. This includes noise generated by your own vessel (electric, propellers, machinery etc), water flow, cavitation and interference. Echoes from fish and other species, as well as from the bottom, are detected and added to the equations.

By comparing these measurements, the EK80 calculates a noise estimate.

Tip

If you set the EK80 to Passive mode, all echoes from the transmissions are removed from the equations. This gives you with better information about the actual noise.

This information is also shown on the **Extras** "menu".

Equivalent ambient noise

The noise estimate provided by the EK80 includes all noises. This includes noise generated by your own vessel, for example electric noise, propellers, machinery and mechanical vibrations. By means of additional equations, the noise values are compensated for the bandwidth. The equivalent ambient noise value attempts to present the total noise as if it was all from ambient sources.

This information is also shown on the **Extras** "menu".

Return to...

BITE (Built-In Test Equipment) dialog box, page 604

Related tasks

Maintaining the EK80, page 341

Related topics

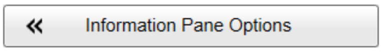
Extras menu, page 554

Normal Operation dialog box, page 572

Acoustic noise, page 771

Pages in the Information Pane Options dialog box

The EK80 offers several *information panes* to provide additional and detailed data from the EK80 presentation. The information panes are opened and closed using the buttons on the top bar. Several of the information panes are fitted with a **Setup** button. Select **Setup** to open the **Information Pane Options** dialog box. Use the **Information Pane Options** dialog box to change the operating parameters for the data provided in the information panes.



How to open

This dialog box is opened from the **Active** menu. You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.

Description

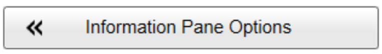
The **Information Pane Options** dialog box offers a menu on the left side, and several pages for pane parameters on the right side.

Colour Scale page

The colour scales used by the EK80 are designed to reflect how strong the echoes are. The echo strength is measured in decibels (dB). Each colour in the scale represents an increase (or decrease) in the echo strength. In the basic colour scale with 12 colours, each colour represents a 3 dB step. The **Colour Scale** parameters allow you to change the echo strength range (in decibels) that each colour represent.

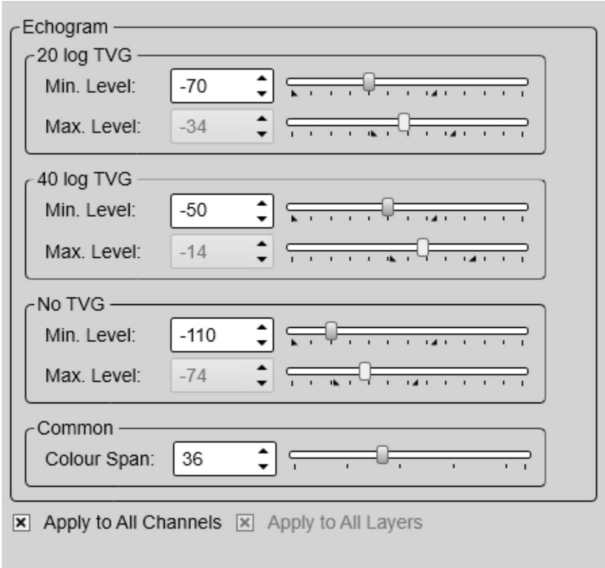
How to open

The page is opened in the **Information Pane Options** dialog box. To open the **Information Pane Options** dialog box, select the button on the **Active** menu.



The **Colour Scale** page is also opened by selecting **Setup** in the *Colour Scale* information pane.

Description



When the **Colour Scale** page opens, it offers two adjustments for each TVG setting; minimum and maximum level. The minimum level chosen is also reflected on the relevant **Minimum Level** button on the **Main** menu.

The **Colour Setup** dialog box allows you to choose from several colour scales to use in the EK80 echo presentations. Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience.

The following colour scales are available:

12 Colours

Sonar Colours

Smooth ES

Grayscale

BI500 Colours

The **Smooth Echosounder** scale is based on the standard 12-colour scale. Additional colours have been added between them to make smoother colour transitions.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

Tip

By default you have 64 or 12 colours available to present the echoes, and a selection of palettes. The colour scale can be retrieved any time by selecting **Colour Scale** *on the top bar. The chosen colours are shown at the bottom of the EK80 presentation.*

If you choose to use many colours, the resolution of the EK80 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Each end of the colour scale reflects a certain echo strength measured in decibels (dB), and these values can be read in the *Colour Scale* information pane. By means of the **Colour Scale** parameters you can adjust these echo strength values. This means that you can adjust the echo strength presented by each colour. The default 3 dB range in the 12 colours scale can thus be adjusted up and own to suit your preferences. When you use 64 colours, each colour can thus represent a chosen range of echo signal strength.

Example

If you set the minimum level to a larger negative value, the EK80 will present weaker echoes with the dark colours. If the colour span is not changed, the maximum level will be changed accordingly. The presentation will thus become for "sensitive" while keeping the same resolution.

If you change the colour span to a larger value you will increase the echo strength area presented, but each individual colour will present a larger area. This means the resolution will be decreased.

Your choice of colour scale has no effect on the minimum level settings. The colour scale only controls the visual presentation of the EK80 echo data.

Details

Min(imum) Level / Max(imum) Level

Set the lower and upper limits of the echo strength you wish the relevant colour scale to reflect. There is one level definition for each TVG setting.

To determine how many dB the echo strength increases for each colour, take the numerical difference between the upper and lower limits, and divide it with the number of colours in the scale.

Common Colour Span

Set the upper limit of the echo strength you wish the colour scaled to reflect.

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Apply to All Layers

Select this box to apply the current selection to all the depth layers you are using on the EK80. In this context, the phrase layer is used to describe the depth layers that may be defined for the EK80 echograms. Each layer is defined by its upper and lower depth limit.

Return to...

Information Pane Options dialog box, page 628

Related tasks

Changing the colour scale in the EK80 presentations, page 175

Related information panes

Colour Scale information pane description, page 464

Related dialog boxes

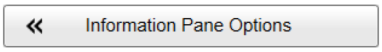
Colour Setup dialog box, page 589

TS Histogram page

The *TS Histogram* information pane shows a histogram of the echoes detected from single fishes. The calculations are based on the fact that different fish species have different echo strength. The echo strength also depends on the operating frequency you use. Use the **TS Histogram** page to define the properties for the histogram shown in the *TS Histogram* information pane.

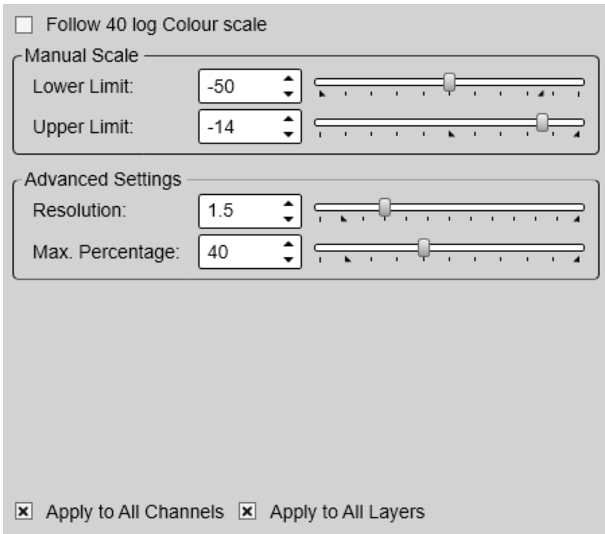
How to open

This page is located in the **Information Pane Options** dialog box. To open, select the button on the **Active** menu.



You can also open the page by selecting **Setup** in the information pane.

Description



The **TS Histogram** settings allow you to shape the vertical bars in the *TS Histogram* information pane to your own requirements. You can set up the upper and lower limits, the accuracy, and the vertical resolution.

Details

Follow 40 Log Colour Scale

> Select this option to let the threshold follow the minimum level defined on the **Colour Scale** page for the corresponding channel.

Lower Limit

> This function specifies the lower limit of the target strengths shown in the histogram.

Upper Limit

> This function specifies the upper limit of the target strengths shown in the histogram.

Resolution

> This function specifies accuracy of the histogram; that is how many vertical bars that are used in the information pane.

Max(imum) Percentage

This function controls the vertical resolution of the histogram.

Apply to All Channels

Select this box to apply the current selection to all the channels on your EK80. In this context, the phrase *channel* is used as a common term to identify the combination of transceiver, transducer and operating frequency.

Apply to All Layers

Select this box to apply the current selection to all the depth layers you are using on the EK80. In this context, the phrase layer is used to describe the depth layers that may be defined for the EK80 echograms. Each layer is defined by its upper and lower depth limit.

Return to...

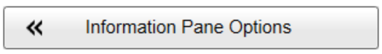
Information Pane Options dialog box, page 628

Sv(f) page

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency. The information is provided as a plot that shows the how the echo strength for a group of targets (for example a school of fish) change with the operational frequency. This functionality allows you to identify the nature of the schools, and discriminate between them. The **Sv(f)** page controls the properties used to create the *Sv(f)* information pane.

How to open

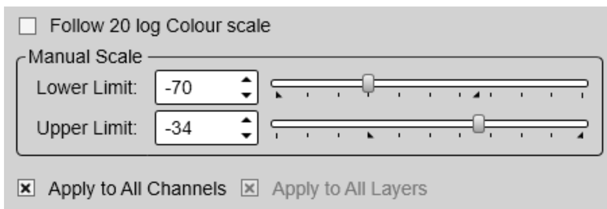
This page is located in the **Information Pane Options** dialog box. To open, select the button on the **Active** menu.



You can also open the page by selecting **Setup** in the information pane.

Description

The scale used in the information pane can be set to follow the scale chosen on the **Colour Scale** page, or it can be set manually.



Details

Follow 20 log Colour Scale

Select this option if you wish the scale in the information pane to follow the scale chosen on the **Colour Scale** page.

Manual scale

Choose the lower and upper limits (in dB) of the scale in the information pane.

Return to...

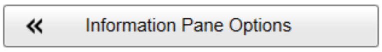
Information Pane Options dialog box, page 628

TS(f) page

The **TS(f)** page controls the properties used to create the *TS(f)* information pane.

How to open

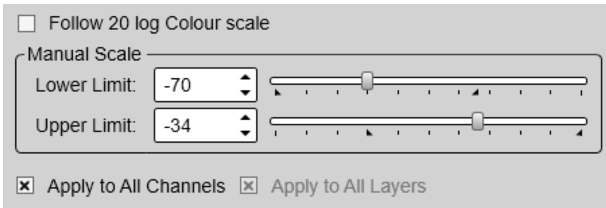
This page is located in the **Information Pane Options** dialog box. To open, select the button on the **Active** menu.



You can also open the page by selecting **Setup** in the information pane.

Description

The scale used in the information pane can be set to follow the scale chosen on the **Colour Scale** page, or it can be set manually.



Details

Follow 20 log Colour Scale

Select this option if you wish the scale in the *TS(f)* information pane to follow the scale chosen on the **Colour Scale** page.

Manual scale

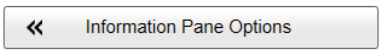
Choose the lower and upper limits (in dB) of the scale in the information pane.

Return to...

Information Pane Options dialog box, page 628

ADCP page

In order to achieve the best current velocity information in the *ADCP* information pane the parameters must be known and set to optimum values.These must be defined to match the current conditions. The ADCP page collect these parameters.



Prerequisites

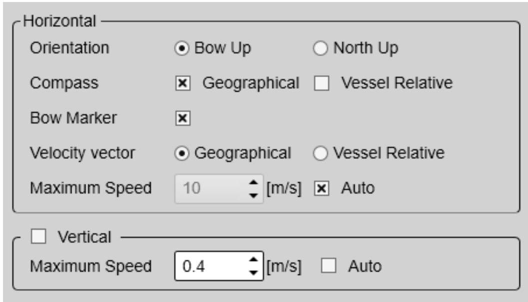
This page is available only when ADCP is activated.

How to open

This dialog box is opened from the **Active** menu. You can also open the **Information Pane Options** dialog box by selecting **Setup** in selected information panes.

Description

In order to display the ADCP data accurately in the ADCP information pane, it is very important that the parameters are set correctly. Several parameters are required to display the velocity values. If these parameters are not known to you, use the default values.



Details

Horizontal

These settings are used to display the current velocity vector which is horizontal. The horizontal velocity vector is displayed as an arrow, showing both magnitude and direction.

- **Orientation**

  In order to see the orientation of the velocities it is important to set the orientation of the compass rose. There are two options.

  – **Bow Up**

  Bow Up displays the vessel with the bow up at all times. The compass configuration, regardless of its relativity, will adapt to the vessel facing bow up in the compass rose.

  – **North Up**

  North Up displays the cardinal direction north upwards in the compass rose at all times. The vessel will, regardless of its relativity, adapt its orientation the north facing upwards in the compass rose.

- **Compass**

  The direction of the compass rose is set to one of the following options:

  – **Geographical**

  The compass rose shows direction relative to the geographic cardinal directions north south, east and west.

  – **Vessel Relative**

The compass rose shows direction relative to the vessel's directions fore, aft, port and starboard.

- **Bow Marker**

  This is an "on/off" switch. Select the box to enable the function. The bow marker is shown as a dotted line drawn from the bow of the vessel symbol. The line reflects your vessel's current heading.

- **Velocity vector**

  The current velocity vector is represented by a vector, which has a speed and a direction. The vector is displayed as an arrow and the direction of the vector can be displayed either **Geographical**, which means relative to cardinal directions, or as **Vessel Relative** which means relative to the direction of the vessel. It is important to notice that the displayed velocities relative to the vessel will have the velocity of the vessel itself superimposed to the current velocity.

- **Maximum Speed**

  This is the maximum speed setting for the vertical speed displayed in the *ADCP*. It is the largest magnitude of the vector representing the current velocity in the vertical direction.The value can be set by the ADCP functionality or you specify a value in the open field. Select **Auto** to enable the ADCP functionality to set a suitable value for the maximum speed. The unit for velocity is either m/s or knots. The units is set in the **Units** page.

Vertical

Maximum Speed

This is the maximum setting for the vertical speed displayed in the *ADCP*. It is the largest magnitude of the vector representing the current velocity in the horizontal direction. The value can be set by the ADCP functionality or you specify a value in the open field. Select **Auto** to enable the ADCP functionality to set a suitable value for the maximum speed. The unit for velocity is either m/s or knots. The units is set in the **Units** page.

Related tasks

Exploring water velocities using ADCP, page 197

Related topics

Acoustic Doppler current profiler, page 779

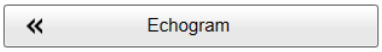
Related dialog boxes

Pages in the ADCP View Settings dialog box, page 739

ADCP information pane description, page 490

Pages in the Echogram dialog box

The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. Two pages control the horizontal lines and the echogram type with applied TVG (time variable gain). One page controls how fast the echogram travels horizontally across the presentation.



Prerequisites

This dialog box is not available when ADCP is activated.

How to open

This dialog box is opened from the **Active** menu.

Description

The **Echogram** dialog box is the main source for all echogram presentation choices. This dialog box contains a number of pages selected from the menu on the left side.

Note

The setting you choose will only be valid for the currently active echogram. Click in any echogram view to make it active. The active echogram view is identified with a thicker border. Select **Apply to All** *if you wish to use the chosen settings on all the echograms of the same type.*

Lines page

The **Lines** page in the **Echogram** dialog box allows you to control the horizontal and vertical lines used in the echogram presentation. You can make the bottom easier to see, and add lines that hold additional information. The vertical scale of the echogram presentation can be changed. If you wish to add annotations to your echogram, these are enabled on this page.

Prerequisites

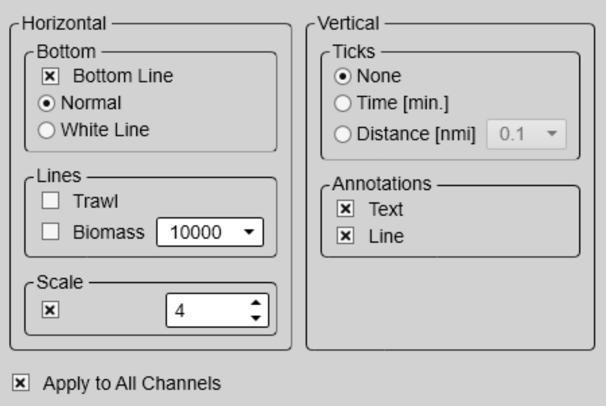
This page is not available when ADCP is activated.

How to open

This page is located in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

Description

The settings on the **Lines** page are all related to visual appearance. The setting(s) you choose will only be valid for the currently active echogram. Click in any echogram view to make it active. The active echogram view is identified with a thicker border. Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.



Details

Bottom

The bottom line can be switched off or on. You can enable a white line to enhance the bottom contour presentation.

- **Bottom Line**: This is an "on/off" switch. Select the box to enable the function. A bottom line can be added to your echogram to enhance the visual bottom detection. It appears as thin line that follows the bottom contour. The line is drawn in the current foreground colour.
- **White Line**: This is an "on" switch. A white line can be added to your echogram to enhance the visual bottom detection. It appears as thick line in the current background colour (normally white) that follows the bottom contour. This line will not remove information, it will simply "push" the echo information further down in order to make the bottom easier to see. You can use the white and the bottom lines simultaneously. Select **Normal** to disable the line.
- **Normal**: This is an "off" switch. The white line is disabled. The bottom line is drawn in the current foreground colour.

Lines

You can enable or disable one or more horizontal lines on the echogram.

- **Trawl**: This is an "on/off" switch. Select the box to enable the function. Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals. The information can be used to draw the upper and/or lower trawl lines in the EK80 echogram.

  Manual trawl setup information can be typed in using the **Trawl** parameters. This is useful for sensor systems that do not measure the trawl opening, or when the measured headrope-to-footrope distance is unreliable. If you have a relevant system in use, you can monitor the depth of the applicable sensors. The **Trawl** page is located in the **Installation** dialog box.
- **Biomass**: This is an "on/off" switch. Select the box to enable the function. This function writes an extra thick and brightly coloured curve on the echogram.

The biomass line shows you the integrated biomass for the pings within the selected calculation interval. Change the scale to fit the vertical space available on the echogram.

Scale

When enabled, equidistant horizontal scale lines are drawn inside the view in the current foreground colour; black during day and white during night. A maximum of 10 scale lines can be selected. No scale lines are drawn when the scale line count is set to 0 (zero).

Vertical

These options control vertical markers and annotations.

- **Ticks**

  This function places short vertical markers on the top of the echogram. These lines are used to measure time or distance.

  - **None**: No vertical markers are shown.
  - **Time**: A short vertical line is drawn in the upper part of the echogram once every minute.
  - **Distance**: A short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

- **Annotations**

  Select **Text** or **Line** to allow annotation markers to be shown. If you select **Line**, each text annotation is followed by a vertical line for improved visibility. Annotations can be typed in manually, set up for automatic generation, or imported from an external device.

  Tip

  Use the **Annotations** *page to type comments and insert annotations into views. Several different annotation types may be added to the echograms or other views. The* **Annotations** *page is located in the* **Installation** *dialog box.*

  When you save raw data, the annotations you have defined are stored as annotation datagrams.

Apply to All

Select **Apply to All** to use the chosen settings on all the ADCP views of the same type.

Return to...

Echogram dialog box, page 610

Related tasks

Setting up the echogram presentation, page 151

Echogram page

The **Echogram** page allows you to choose which type of echogram you wish to display. You can also control the TVG (Time Variable Gain). The EK80 can work with several different TVG compensation settings. The TVG (Time Variable Gain) compensation is designed to counteract the natural phenomena of geometric spread and absorption loss.

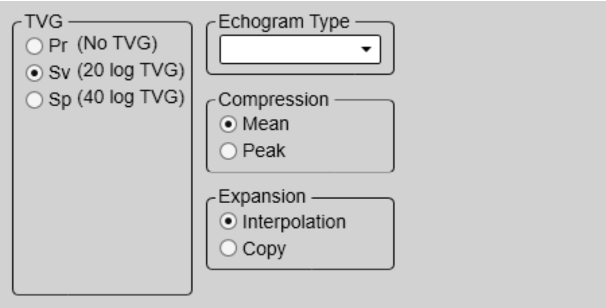
Prerequisites

This page is not available when ADCP is activated.

How to open

This page is located in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

Description



Each separate echogram view offered by the EK80 can show you a different echogram type. Which type to see is chosen on this **Echogram** page. The page also allows you to select which TVG curve to use for the chosen echogram.

The **Compression** and **Expansion** options are provided to specify how sample data are converted to pixel data.

The setting(s) you choose will only be valid for the currently active echogram. Click in any echogram view to make it active. The active echogram view is identified with a thicker border. Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.

Tip

You can also select TVG setting with the **TVG** *function. The* **TVG** *(Time Varied Gain) function is located on the* **Active** *menu.*

Details

TVG (Time Variable Gain)

When an acoustic pulse is sent through the water, it will gradually lose its energy. The greater the distance between the transducer and the target(s), the greater the loss of energy.

The TVG (Time Variable Gain) compensation is designed to counteract the natural phenomena of geometric spread and absorption loss. The TVG compensation is expressed as a logarithmic curve. You can choose from a selection of curves. Each curve has a different slope creating a different gain compensation.

Select the **TVG** setting you want to use. Several TVG compensation settings are available.

- **No TVG**: TVG compensation is not implemented. This option is hardly ever used.
- **Sv (20 Log)**: Volume backscattering strength
- **Sp (40 Log)**: Point backscattering strength

Echogram Type

Use this function to select what kind of echogram you wish to see in the current (active) view.

- *Surface*

  A *Surface* echogram is mainly used when you wish to look at the entire water column starting from the sea surface and down to the sea bottom.

  Since this echogram is referenced to the sea surface, the sea bottom contour will vary with the actual depth. If you set up the **Start Range** and **Range** depths to place the sea bottom contour at the lower end of the echogram, you will have good opportunity to study the echoes from the water column.

  In the surface echogram, all calculations are made from the sea surface and down to the detected sea bottom. Use this echogram type to obtain correct calculation of the biomass. It will also provide valid data for the *Target Strength Histogram* information pane.

- *Bottom*

  A *Bottom* echogram is mainly used when you want to examine the echoes from fish close to the sea bottom.

  Since this echogram is referenced to the sea bottom, the sea surface will vary with the actual depth, while the bottom is drawn flat. This makes it easy to study the echoes from the sea bottom. You can investigate the sea bottom conditions and hardness, and detect fish.

  The echogram is only drawn for pings that have a successful bottom detection.

- *Pelagic*

  A *Pelagic* echogram is mainly used when you wish to look at the water column starting from any distance below the sea surface down towards the bottom, but without seeing the bottom contour.

  Pelagic echograms are useful when you work in deeper waters. The reduced range and the fact that you do not need to wait for the bottom echo means that the EK80's ping rate is increased.

  In a *Pelagic* echogram the calculations disregard any bottom detection. All calculations are based on the entire echogram shown in the view. If the bottom echo is present in the echogram, the biomass calculation will be wrong.

- *Trawl*

  Trawl sensor systems (such as Simrad PI, PX and ITI) communicate headrope depth, and/or the distance from the headrope to the footrope (trawl opening), to the EK80 at regular intervals.

  This information is required for the trawl echogram to be generated. The *Trawl* echogram covers the vertical opening of the trawl with reference to the depth of the headrope. In addition to the trawl opening, the echogram covers a certain range over and under the trawl opening.

  The biomass calculations in a *Trawl* echogram are not restricted by the bottom detection. This means that the bottom echo will be included in the calculations if it appears within the chosen range.

  The echogram is only drawn when trawl position information is available.

Compression / Expansion

The **Compression** and **Expansion** options are provided to specify how sample data are converted to pixel data.

Each ping consists a given number of data samples, where the number of samples is set by the current depth range. This number of samples does not necessarily match the number of vertical pixels in the echogram presentation. The data samples must therefore be compressed or expanded to fit the number of available pixels. In other echo sounders, this function is handled automatically without allowing you to control the process.

- **Compression**

  The **Compression** options describe the situation when the number of samples is *higher* than the number of pixels, and multiple samples are compressed into one pixel.

  – **Mean**: The mean of the samples is used as pixel value.

  – **Peak**: The peak value of the samples is used as pixel value.

- **Expansion**

  The **Expansion** function provides a mean to adjust the presentation when the number of samples is lower than the number of pixels used to display them. When this happens the sample values must be expanded to match the pixel values.

  – **Interpolation**: To adjust the presentation, the pixel values are interpolated between two sample values.

  – **Copy**: The expansion takes place by copying sample values into multiple pixel values.

Apply to All

Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.

Return to...

Echogram dialog box, page 610

Related tasks

Setting up the echogram presentation, page 151

Related functions

TVG (Time Variable Gain) function, page 609

Horizontal Axis page

The echogram travels from right towards left across the EK80 presentation. On the **Horizontal Axis** page you can choose the horizontal scale of the echogram. This controls the "speed" of the echogram.

Prerequisites

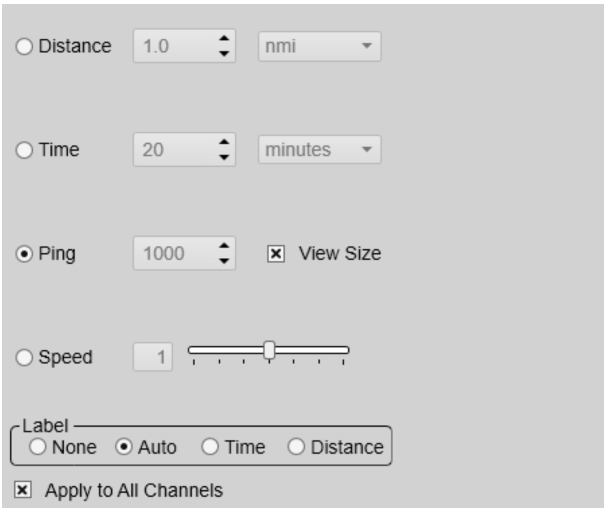
This page is not available when ADCP is activated.

How to open

This page is located in the **Echogram** dialog box. The **Echogram** dialog box is located on the **Active** menu.

Description

The horizontal scale controls how "fast" the echograms move from right towards left across the EK80 presentation. The setting(s) you choose will only be valid for the currently active echogram. Click in any echogram view to make it active. The active echogram view is identified with a thicker border. Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.



Details

Horizontal Axis

The echogram travels from right towards left across the EK80 presentation. On the **Horizontal Axis** page you can choose the horizontal scale of the echogram. This controls the "speed" of the echogram.

- **Distance**: The horizontal scale is based on sailed distance. Select resolution and unit.

- **Time**: The horizontal scale is based on time. Select resolution and unit.
- **Ping**: The horizontal scale is based on the number of transmissions ("pings") made. Select **View Size** to specify that the number of horizontal pixels shall define the number of displayed horizontal pings using one ping per pixel.
- **Speed**: The horizontal scale is based on the relative speed you choose. Select speed with the ruler.

Label

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis of the echogram. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

Apply to All

Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.

Return to...

Echogram dialog box, page 610

Related tasks

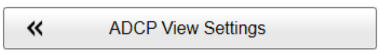
Setting up the echogram presentation, page 151

Pages in the ADCP View Settings dialog box

Use the **ADCP View Settings** dialog box to select the ADCP views you want to see. You can also define the parameters for these views. This includes horizontal axis units, labels, lines and ticks. These features are implemented to enhance the ADCP data presentation.

How to open

You open this dialog box from the **Active** menu.



Description

In the **ADCP View Settings** dialog box you can add new ADCP views and select display settings for the individual ADCP views.

Topics

Horizontal Axis page, page 740

Lines page, page 741

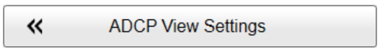
View Selection page, page 744

Horizontal Axis page

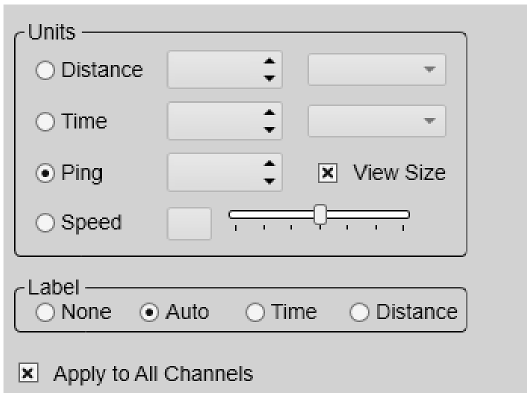
The ADCP readings travel from right towards left across the EK80 presentation. On the **Horizontal Axis** page you can choose the horizontal scale of the ADCP readings. This controls the "speed" of the ADCP readings.

How to open

You open this dialog box from the **Active** menu.



Description



The horizontal scale controls how fast the ADCP data move from right towards left across the EK80 presentation The setting(s) you choose will only be valid for the active view. Click in any view to make it active. Select **Apply to All** to use the chosen settings on all the ADCP views of the same type.

Details

Horizontal Axis

On the **Horizontal Axis** page you can choose the horizontal scale of the ADCP readings. This controls the "speed" of the ADCP readings.

- **Distance**: The horizontal scale is based on sailed distance. Select resolution and unit.
- **Time**: The horizontal scale is based on time. Select resolution and unit.
- **Ping**: The horizontal scale is based on the number of transmissions ("pings") made. Select **View Size** to specify that the number of horizontal pixels shall define the number of displayed horizontal pings using one ping per pixel.

- **Speed**: The horizontal scale is based on the relative speed you choose. Select speed with the ruler.

Label

Small labels are shown in the bottom left and right corners of the view. These labels can contain time or distance to identify the horizontal axis. You can hide the labels from view.

- **None**: The labels are hidden
- **Auto**: The horizontal scale is set automatically
- **Time**: The horizontal scale is defined by time. The time shown in the bottom right corner of the echogram is then the current time (now).
- **Distance**: The horizontal scale is defined by distance. The distance shown in the bottom right corner of the echogram is then 0 nautical miles (starting point).

Apply to All

Select **Apply to All** to use the chosen settings on all the ADCP views of the same type.

Return to...

Pages in the ADCP View Settings dialog box, page 739

Related topics

Acoustic Doppler current profiler, page 779

Related tasks

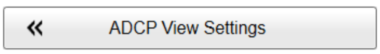
Setting up the ADCP presentation, page 212

Lines page

The **Lines** page in the **ADCP View Settings** dialog box controls the horizontal and vertical lines used in the ADCP views. You can make the bottom easier to see, and add lines that hold additional information. The vertical scale of the ADCP views can be changed. If you wish to add annotations to your ADCP views, these are enabled on this page.

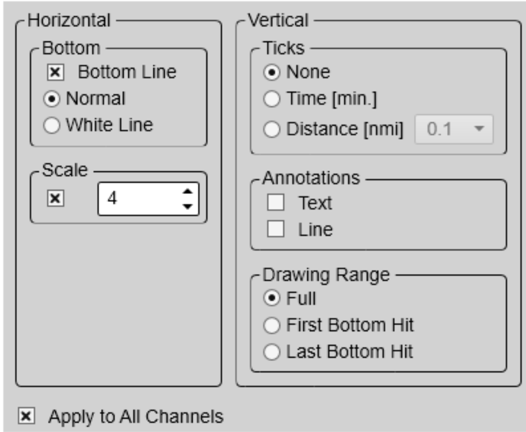
How to open

This dialog box is opened from the **Active** menu.



Description

The settings on the **Lines** page are all related to visual appearance. The setting(s) you choose will only be valid for the active view. Click in any view to make it active. The active view is identified with a thicker border. Select **Apply to All** to use the chosen settings on all the ADCP views of the same type.



Details

Bottom

The bottom line can be switched off or on. You can enable a white line to enhance the bottom contour presentation.

- **Bottom Line**

  This is an "on/off" switch. Select the box to enable the function. A bottom line can be added to your echogram to enhance the visual bottom detection. It appears as thin line that follows the bottom contour. The line is drawn in the current foreground colour.

- **Normal**

  This is an "off" switch. The white line is disabled. The bottom line is drawn in the current foreground colour.

- **White Line**

  This is an "on" switch. A white line can be added to your echogram to enhance the visual bottom detection. It appears as thick line in the current background colour (normally white) that follows the bottom contour. This line will not remove information, it will simply "push" the echo information further down in order to make the bottom easier to see. You can use the white and the bottom lines simultaneously. Select **Normal** to disable the line.

Scale

When enabled, equidistant horizontal scale lines are drawn inside the view in the current foreground colour; black during day and white during night. A maximum of 10 scale lines can be selected. No scale lines are drawn when the scale line count is set to 0 (zero).

Vertical

These options control vertical markers and annotations.

- **Ticks**

  This function places short vertical markers on the top of the echogram. These lines are used to measure time or distance.

  – **None**: No vertical markers are shown.

  - **Time**: A short vertical line is drawn in the upper part of the echogram once every minute.
  - **Distance**: A short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

- **Annotations**

  Select **Text** or **Line** to allow annotation markers to be shown. If you select **Line**, each text annotation is followed by a vertical line for improved visibility. Annotations can be typed in manually, set up for automatic generation, or imported from an external device.

  Tip

  Use the **Annotations** *page to type comments and insert annotations into views. Several different annotation types may be added to the echograms or other views. The* **Annotations** *page is located in the* **Installation** *dialog box.*

  When you save raw data, the annotations you have defined are stored as annotation datagrams.

- **Drawing range**

  Drawing range defines the depth range used for the ADCP views. This is purely a visual setting for the views. Each of the ADCP beams are set at a 30 degrees angle to the vertical centre line of the ADCP transducer. The four beams from the ADCP transducer will hit bottom at different range due to their different directions and due to the varying topography of the sea floor. Water velocity calculations will be performed according to the range specified.

  - **Full**: Drawing range is specified by the number of samples available. The drawing range in the ADCP views will be the range of the ADCP transducer. This is limited by view range and recording range set in the user interface.
  - **First Bottom Hit**: Drawing range is defined from the vessel to the depth at which the first of the ADCP beams hits the sea floor.
  - **Last Bottom Hit**: Drawing range is defined from the vessel to the depth at which the last ADCP beam hits the sea floor.

Apply to All

Select **Apply to All** if you wish to use the chosen settings on all the echograms of the same type.

Return to...

Pages in the ADCP View Settings dialog box, page 739

Related topics

Acoustic Doppler current profiler, page 779

Related tasks

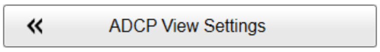
Setting up the ADCP presentation, page 212

View Selection page

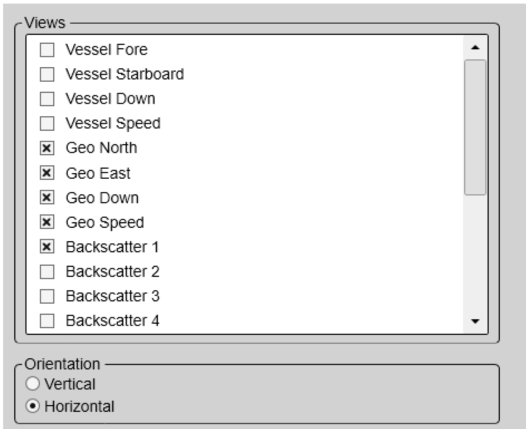
Use the **ADCP View Settings** dialog box to select the ADCP views you want to see. The **View Selection** page allows you to choose which views to present, and how to organize them.

How to open

You open this dialog box from the **Active** menu.



Description



ADCP data is presented in a dedicated presentation. The **View Selection** page allows you to choose which views to present, and how to organize them.

Some of the views are numbered according to which beam they represents. The relationship between the numbering and the orientation of the beam they represents can be seen in the *Depth* pane in the **Top** bar.

1 **Fore Starboard**

2 **Aft Port**

3 **Aft starboard**

4 **Fore Port**

Tip

If you want to create more ADCP presentations, use the **Docking view** *function to create new ADCP presentations. You can display Correlation views in one ADCP presentation and Geo Velocity view in another presentation. You can display Geo Velocity views using single-ping data in one presentation and in another presentation you can use the* **Ping Average** *function to observe differences.*

Some of the parameters used in these ADCP views are set elsewhere in the user interface.

- Colour scale is set in the **Top bar**.
- Horizontal scales and lines are set in the **ADCP View Settings** dialog box
- Units are set in the **Installation** dialog box.

Details

Views

All available ADCP views are listed in this section. Tick the box in front of the view you would like to see in the ADCP presentation.

- *Vessel Velocity*

  The *Vessel Velocity* views display water velocities relative to the vessel. The views display water velocity in fore/aft and port/starboard direction as well as down towards the seafloor. Vessel speed is displayed separately.

- *Geo Velocity*

  The *Geo Velocity* views display water velocity relative to earth coordinates, i.e. water current velocity. The water current velocity is displayed in the cardinal directions (north-south, east-west), as well as velocity down towards the bottom. Water current speed is displayed in a separate view.

- *Beam Velocity*

  The *Beam Velocity* presentation displays the water velocity along the beam direction. The water is either moving towards of away from the ADCP transducer at the same angle as the vertical orientation of the beam (30 degrees). The *Beam Velocity* presentation includes one view for each beam.

- *Backscatter*

  Backscatter views display echo intensity in echograms, one for each of the ADCP beams. Backscatter data are output in decibel (dB).

- *Correlation*

  The *Correlation* views display a measure of the similarity between the received echoes. Correlation is a measure of data quality.

- *Error Velocity*

  Error velocity is the difference between two estimates of the vertical velocity. It is an important means to evaluate the data quality. Error velocity will show the magnitude of the errors, not the source.

- *Percent Good*

  The *Percent Good* view displays the percentage of pings which has passed a set of defined quality criteria. The rejection criteria include low correlation and large error velocity. The default threshold is defined in the **ADCP Editing** dialog box.

Orientation

- **Vertical**

  Vertical orientation mode arranges the views adjacent to each other vertically. This is a useful presentation mode if you want to see snapshots of the complete water column in the four beams adjacent to each other.

- **Horizontal**

  Horizontal orientation mode arranges the views adjacent to each other horizontally. This is a useful presentation mode if you want to see ADCP data over a longer period of time or distance.

Return to...

Pages in the ADCP View Settings dialog box, page 739

Related topics

Acoustic Doppler current profiler, page 779

Related tasks

Setting up the ADCP presentation, page 212

Secondary functions and dialog boxes

Topics

Replay File dialog box

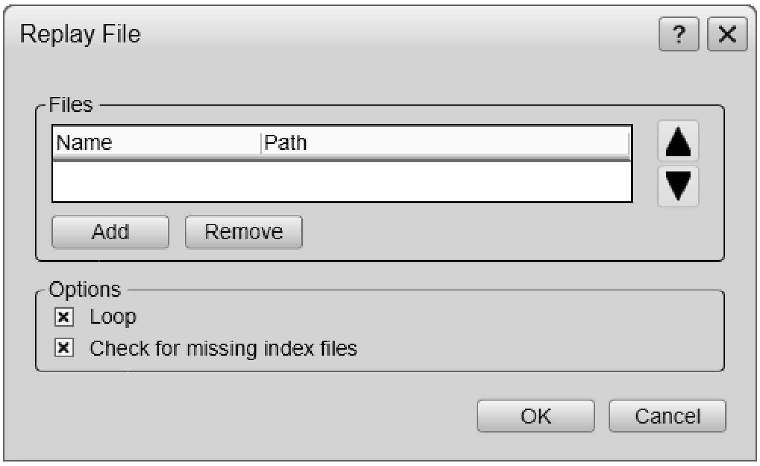
The **Replay File** dialog box allows you to choose the echo data file(s) you wish to play back.

How to open

To open the **Replay File** dialog box, select **Operation**. The **Operation** function is located on the **Operation** menu. Select **Replay File**.

Tip

Once the playback has started, you can also open the **Replay File** *dialog box from the replay bar.*



Description

A key function of the EK80 is it ability to record echo data. You can save the data to the Processor Unit hard disk, or onto an external storage device. The **Replay File** dialog box allows you to choose which file(s) to play back.

All playback is controlled by the replay bar. The replay bar opens automatically at the top of the EK80 presentation when you choose *Replay* mode.

A *Stop*

B *Play/Pause*

C *Replay Speed*

D *Replay File*

E *Elapsed Time*

F *Playback Progress*

The **Replay File** dialog box allows you to add one or more files to a list of active files for playback.

Select **Loop** to establish continuous playback with all the file(s) you have chosen. To delete a file from the playback list, simply click the filename, and then the **Remove** button. The file is removed from the list, but not from the hard disk.

Details

Files

This list displays the files that are currently available for playback.

Add

Select **Add** to include additional file(s) in the **Files** list. A standard operating system dialog box opens to let you choose files.

Remove

Select a file in **Files** list, then select **Remove**. The file is removed from the list, but not from the hard disk. If you wish to delete a file from your hard disk, you need to use a file manager program.

Loop

Select **Loop** if you want the EK80 to play back all the files in the **Files** list in an endless loop. The replay will run until you stop it in the replay bar, or choose a different operational mode.

Check for missing index files

During raw file recording, the EK80 automatically creates index files to allow for easier navigation in the replay files. On old files, however, these index files are not present. If you activate the **Check for missing index files** function, the index files are created on the selected files before playback starts.

Note

Creating index files can take a long time if you have many or/and large replay files, or if the files are stored on a network server.

Related tasks

Recording and replaying raw echo data, page 127

Related functions

Operation function, page 569

Record RAW function, page 582

Add Window dialog box

Modern computers can easily feed more than one display. The **Add Window** dialog box makes it possible to create a new window for a dedicated echogram presentation. The new window can contain a copy of an existing echogram channel, or it can be used to present a channel that is currently not visible. The window can for example be placed on a second (or third) display connected to your Processor Unit.

How to open

The dialog box is opened from the menu provided by the **Docking Views** button. This function is opened from the **Display** menu.

Description

Computers with graphic adapters supporting more than one display are fairly common. The **Add Window** function has been implemented to show echogram presentations on multiple displays. The function is also useful if your Processor Unit is only fitted with a large single display.

To move a chosen echogram to a separate window, simply choose the channel (identified with its transducer), and click **Ok**. The new window contains the chosen echogram channel. You can move this window to any display using the functionality provided by the operating system. To close the window, click the "X" in its top right corner.

When you have created a new presentation mode, use the **Add Window** functionality to add views to it.

The phrase *presentation mode* is used to describe the combination of views that are displayed when the mode is selected at the bottom of the EK80 presentation.

Return to...

Docking Views function, page 593

Related tasks

Setting up presentation modes and views, page 238

Setting up the ADCP presentation, page 212

Related dialog boxes

Presentation Modes dialog box, page 591

LAN Port Setup dialog box

The **LAN Port Setup** dialog box allows you to define the parameters for Ethernet (Local Area Network (LAN)) communication with external devices. External devices may for example be navigation sensors (speed, position, etc.) or peripheral systems.

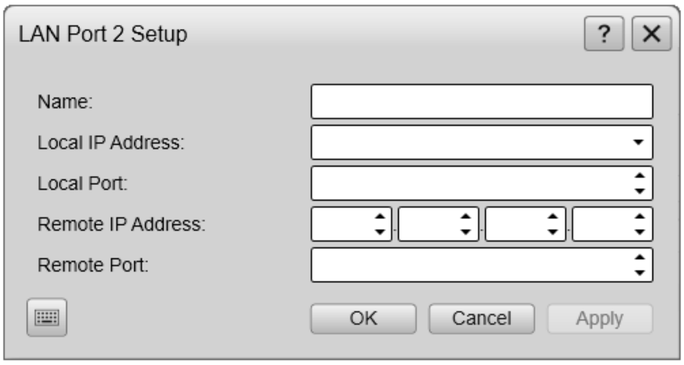
How to open

To open the **LAN Port Setup** dialog box, select a LAN port on the **I/O Setup** page, and select **Setup**.

The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes. The **Installation** dialog box is located on the **Setup** menu. The **Output** dialog box is located on the **Operation** menu.

Description

Ethernet (Local Area Network (LAN)) communication is an efficient way to connect to external sensors, such as a global positioning system (GPS), to receive navigational data. In order for this communication port to work, the parameters must be set up properly.



Tip

The settings in the dialog box are only provided to define the actual communication parameters. You can not select which inputs or outputs to use. However, you must set up these communication parameters before you select input or output datagrams.

All navigation and motion sensors are connected using the **Sensor Installation** *page. You must also specify which datagram formats to use. The* **Sensor Installation** *page is located in the* **Installation** *dialog box. The* **Installation** *dialog box is located on the* **Setup** *menu.*

Details

Name

This is a text box. Type a suitable name for the communication port. If you do not have a computer keyboard connected to your Processor Unit, select the **Keyboard** button to open an on-screen keyboard.

Local IP Address

This is the Internet Protocol (IP) address of the Ethernet interface adapter located in your Processor Unit. In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one Ethernet adapter, you are provided with a list of the available addresses.

Local Port

The **Local Port** is important if you want to receive information from a peripheral device to your the Processor Unit. The number you define here must match the port number on the peripheral device that is providing the information. This peripheral device is for example a sensor on the network, or another navigation or hydroacoustic system. To find the port number on the peripheral device, consult the documentation for the device, and/or the application to be used on it.

If the data communication is set up to only export information from the Processor Unit to a peripheral device, this **Local Port** parameter is not required.

Remote IP Address

The **Remote IP Address** is the Internet Protocol (IP) address for a peripheral device. This peripheral device is for example a sensor on the network, or another navigation or hydroacoustic system. If the data communication between your Processor Unit and the peripheral device is set up to only import data from the device, the remote IP address is not required.

If you want to export information from the Processor Unit to one or more peripheral devices (*Broadcast* mode), set **Remote IP Address** to 255.255.255.255. This is the default setting. If you want to use *point-to-point* communication in a closed network, set the remote IP address manually.

Remote Port

The **Remote Port** is important if you want to export information from the Processor Unit to a peripheral device on the local area network (LAN). If you want to use *point-to-point* communication in a closed network, set the remote IP address manually. The application on the peripheral device will "listen" to this port number.

If you want to establish *point-to-point* communication for data import from a peripheral device on the network, you may need to define the network port on this device.

To find the port number on the peripheral device, consult the documentation for the device, and/or the application to be used on it.

Related tasks

Installing navigation sensors and other sensors, page 268

Defining the serial and Ethernet (LAN) port parameters, page 270

Return to...

Output dialog box, page 586

I/O Setup page, page 636

Installation dialog box, page 602

Serial Port Setup dialog box

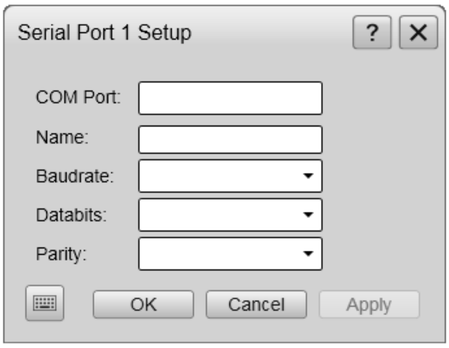
Serial line communication is important for EK80 operation. The information from external devices, such as navigation sensors, is based on serial line "datagrams". For most commercial devices, the formats of these datagrams are defined by NMEA (National Marine Electronics Association). The **Serial Port Setup** dialog box allows you to define the communication parameters for serial line ports. These ports are typically used to interface external devices, such as navigation sensors.

How to open

To open the **Serial Port Setup** dialog box, select a serial port on the **I/O Setup** page, and select **Setup**.

The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes. The **Installation** dialog box is located on the **Setup** menu. The **Output** dialog box is located on the **Operation** menu.

Description



A serial port is a serial communication interface that is still very common between maritime systems. It is very important that any serial line between the EK80 and any external system is setup correctly with identical parameters at each end. The NMEA (National Marine Electronics Association) standard for serial communication defines standard parameters for such interfaces.

According to their web site, the National Marine Electronics Association (NMEA) is "the unifying force behind the entire marine electronics industry, bringing together all aspects of the industry for the betterment of all in our business". For more information, see: http://www.nmea.org

Details

COM Port

This text box identifies the current communication port on the Processor Unit. You can not change this information.

Name

This is a text box. Type a suitable name for the communication port. If you do not have a computer keyboard connected to your Processor Unit, select the **Keyboard** button to open an on-screen keyboard.

Baud Rate

Use this setting to specify the baud rate ("speed") for the serial communication. The standard baud rate defined for NMEA serial line communication is 4800 baud.

> In digital communications, *symbol rate*, also known as *baud rate* and *modulation rate*, is the number of symbol changes, waveform changes, or signalling events, across the transmission medium per time unit using a digitally modulated signal or a line code. The symbol rate is measured in *baud* (Bd) or symbols per second. In the case of a line code, the symbol rate is the pulse rate in pulses per second. Each symbol can represent or convey one or several bits of data. The symbol rate is related to the gross bit rate expressed in bits per second.
>
> *https://en.wikipedia.org/wiki/Symbol_rate*

Data Bits

Use this function to specify the number of data bits for serial communication. The standard number of data bits defined for NMEA serial line communication is 8 (eight).

Parity

Use this function to specify the parity for serial communication. The standard parity defined for NMEA serial line communication is "None".

> A *parity bit*, or *check bit* is a bit added to the end of a string of binary code that indicates whether the number of bits in the string with the value one is even or odd. Parity bits are used as the simplest form of error detecting code. [...] In serial data transmission, a common format is 7 data bits, an even parity bit, and one or two stop bits. This format neatly accommodates all the 7-bit ASCII characters in a convenient 8-bit byte. Other formats are possible; 8 bits of data plus a parity bit can convey all 8-bit byte values.
>
> *https://en.wikipedia.org/wiki/Parity_bit*

Related tasks

Installing navigation sensors and other sensors, page 268

Defining the serial and Ethernet (LAN) port parameters, page 270

Return to...

Output dialog box, page 586

I/O Setup page, page 636

Installation dialog box, page 602

Port Monitor dialog box

Communication with external devices is important for EK80 operation. The communication between the Processor Unit and peripheral devices takes place using "datagrams". These datagrams are self-contained and independent entities of data carrying information. When setting up or maintaining the EK80, it is always useful to verify that the communication lines with external devices are operational. The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line or LAN port.

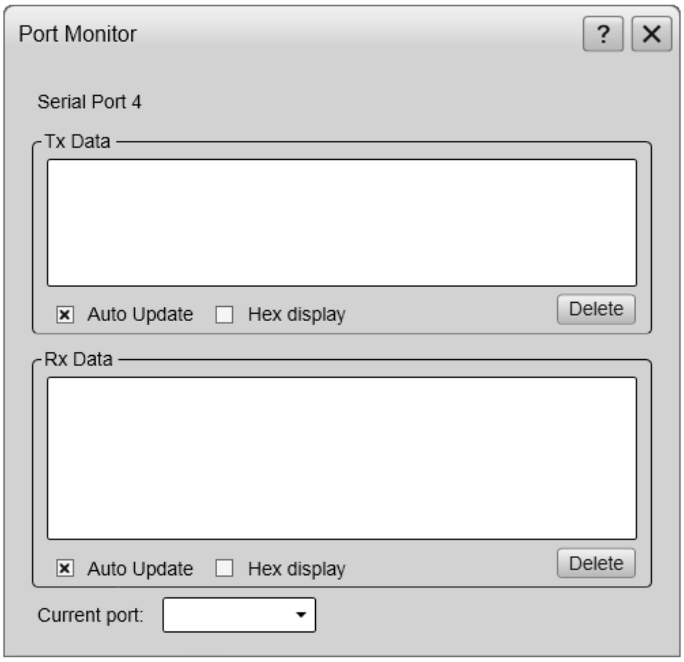
How to open

To open the **Port Monitor** dialog box, select a serial or LAN port on the **I/O Setup** page, and select **Monitor**.

The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes. The **Installation** dialog box is located on the **Setup** menu. The **Output** dialog box is located on the **Operation** menu.

Description

The **Port Monitor** dialog box provides one text box for incoming messages (**Rx Data**), and one for outgoing messages (**Tx Data**). Use these boxes and your knowledge of the data communication to investigate the datagrams.



Note

The **Port Monitor** *dialog box is a tool for debugging purposes. It is neither required nor intended for normal operation of the EK80.*

Details

Tx Data

This text box displays the data communication exported from the EK80 to external devices. If you have enabled **Auto Update**, the text box is continuously updated with new information.

Rx Data

This text box displays the data communication received by the EK80 from external devices. These external devices may for example be navigation sensors, motion reference units, or other hydroacoustic systems. If you have enabled **Auto Update**, the text box is continuously updated with new information.

Auto Update

When this function is activated, the relevant text box is continuously updated with new information. If you wish to "freeze" the information for further investigation, deactivate to disable the automatic update.

Hex display

Select this to show the information in the relevant text box in hexadecimal format.

Delete

This function clears the text box to allow a new stream of communication data to start on a blank page.

Current port

This box identifies the port you are currently monitoring.

Tip

If you wish to change your attention to a different serial or LAN port, you can choose the communication port here instead of returning to **I/O Setup**.

Related tasks

Installing navigation sensors and other sensors, page 268

Defining the serial and Ethernet (LAN) port parameters, page 270

Return to...

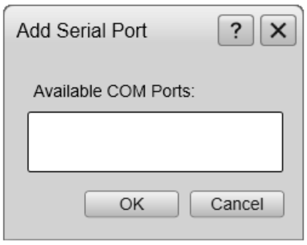
Output dialog box, page 586

I/O Setup page, page 636

Installation dialog box, page 602

Add Serial Port dialog box

Serial line communication is important for EK80 operation. The information from external devices, such as navigation sensors, is based on serial line "datagrams". For most commercial devices, the formats of these datagrams are defined by NMEA (National Marine Electronics Association). The **Add Serial Port** dialog box allows you to put a free serial port (COM port) on the Processor Unit to use for interface purposes.



How to open

To open the **Add Serial Port** dialog box, select **Add** under the list of serial ports on the **I/O Setup** page.

The **I/O Setup** page is located in the **Installation** and **Output** dialog boxes. The **Installation** dialog box is located on the **Setup** menu. The **Output** dialog box is located on the **Operation** menu.

Description

The first time the Processor Unit is powered up after a EK80 software installation, it will automatically do a search to find available serial ports.

- If the Processor Unit was provided by Kongsberg Maritime as a part of the EK80 delivery, you can only use the ports that were fitted by the manufacturer.
- If the Processor Unit was purchased locally, you may increase the number of serial ports by adding a serial adapter.

If you have added new hardware, you must also allow the EK80 to use the new port(s). Select **Add**, and use the **Add Serial Port** dialog box. Select the port in the list, and select **OK**.

Tip

You can give your new serial port a more descriptive name in the **Serial Port Setup** *dialog box.*

Related tasks

Installing navigation sensors and other sensors, page 268

Defining the serial and Ethernet (LAN) port parameters, page 270

Return to...

Output dialog box, page 586

I/O Setup page, page 636

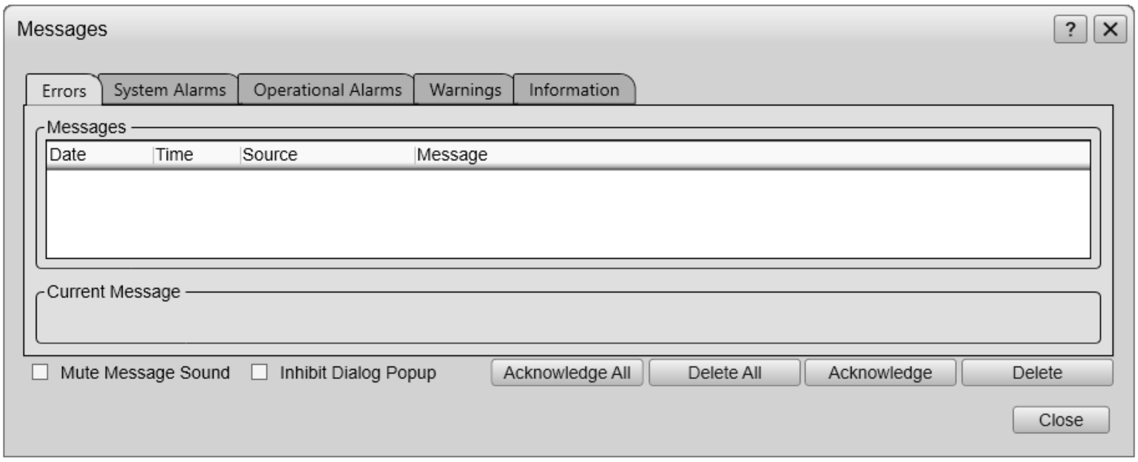
Installation dialog box, page 602

Messages dialog box

The **Messages** dialog box allows you to read and acknowledge the messages issued by the EK80.

How to open

To open the **Messages** dialog box, select **Messages** on the top bar. When a new message is issued by the EK80, the button on the top bar flashes. The colour of the triangle reflects the severity of the most serious message. If you hold the cursor over the button, a short list of the current messages is shown.



Description

Messages from the EK80 can be related to any type of hardware or software errors. Messages also communicate events related to the operational performance and conditions. The messages are divided into different types related to their importance. Warnings are indicated with a yellow colour, while errors are indicated with a red colour.

The **Messages** dialog box shows you the relevant information, the source of the information, and the time of the message. You can select a message text to copy it to the larger text box under the table. This make abbreviated messages easier to read. Several message types are used. The dialog box offers one page for each type.

Message types

- **Errors**

  These errors are fatal. Operation of the EK80 cannot continue. You need to turn off the EK80and attempt a restart.

- **System alarms**

  These are messages related to the EK80 operation, or to major software components. You can continue the operation, but note that the data provided by the EK80 may be inaccurate. A restart is recommended.

- **Operational alarms**

  These are messages related to environment conditions, interface or other non-software events. Depending of the message nature, check that all interfaces to the EK80 are operational. A system restart may be required.

- **Warnings**

  A warning is issued when an irregular event occurs. Depending on the nature of the message, check what is causing the warning. A restart is normally not required.

- **Information**

  An information messages is simply a notification of a minor operational event. No corrective actions are required.

Details

Messages

The messages are listed in a table. For each message, the date and time of issue is shown. The source of the information (for example a software function) is also provided. This information is provided for support and maintenance use.

Current Message

The text in a message may be longer than the tabular view shows you. To read the complete message, select it. The full text is then copied into the **Current Message** box.

Mute Message Sound

Messages can be presented using an audible sound. The sound is only provided if your Processor Unit is equipped with a loudspeaker. Use this option to disable the audible signal.

Inhibit Dialog Popup

Select this option to prevent the **Messages** dialog box from opening automatically.

Note

When this option is enabled, you must keep an eye on the icon on the top bar, as new messages will only be flagged using this icon.

Delete / Delete All

Select **Delete** to remove the currently selected message, or **Delete All** to remove all messages of the current type.

Acknowledge / Acknowledge All

Select **Acknowledge** to accept the currently selected message, or **Acknowledge All** to accept all new messages of the current type.

Related functions

Messages button description, page 460

Concept descriptions

Topics

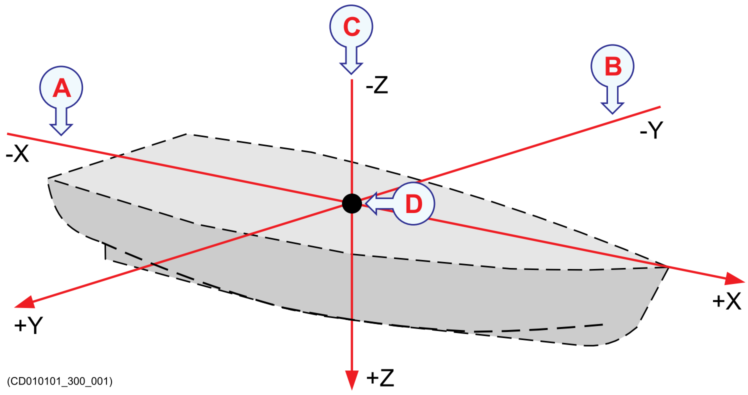
Vessel coordinate system

The vessel coordinate system is established to define the relative physical locations of systems and sensors.

When you have several different sensors and transducers on your vessel, and you wish each of them to provide accurate data, you need to know their relative physical positions. The antenna of a position sensor is typically mounted high above the superstructure, while a motion sensor is located close to the vessel's centre of gravity. Both of these are physically positioned far away from the transducer on a depth sensor, which may be located closer to the bow. Very often, the information from one sensor depends on data from an other. It is then important that the relevant measurements are compensated for these relative distances.

> *Example*
>
> If you wish to measure the actual water depth, you will need to know the vertical distance from the echo sounder transducer to the water line. Since the vessel's displacement changes with the amount of cargo, fuel etc, the physical location of the water line on the hull must either be measured at a regular basis, or measured with a second sensor.

In order to establish a system to measure the relative distance between sensors, a virtual coordinate system is established. This coordinate system uses three vectors; X, Y and Z.



A *The X-axis is the longitudinal direction of the vessel, and in parallel with the deck. A positive value for X means that a sensor or a reference point is located ahead of the reference point (origin).*

B *The Y-axis is the transverse direction of the vessel, and in parallel with the deck. A positive value for Y means that a sensor or a reference point is located on the starboard side of the reference point (origin).*

C *The Z-axis is vertical, and in parallel with the mast. A positive value for Z means that a sensor or a new reference point is located under the reference point (origin).*

D *Reference point (Ship Origin)*

Coordinate system origin

The *origin* is the common reference point where all three axis in the vessel coordinate system meet. All physical locations of the vessel's sensors (radar and positioning system antennas, echo sounder and sonar transducers, motion reference units, etc.) are referenced to the origin. In most cases, the location of the vessel's "official" origin has been defined by the designer or shipyard. This origin is normally identified with a physical marking, and also shown on the vessel drawings.

Frequently used locations are:

- Aft immediately over the rudder (frame 0)
- Vessel's centre of gravity
- The physical location of the motion reference unit (MRU)

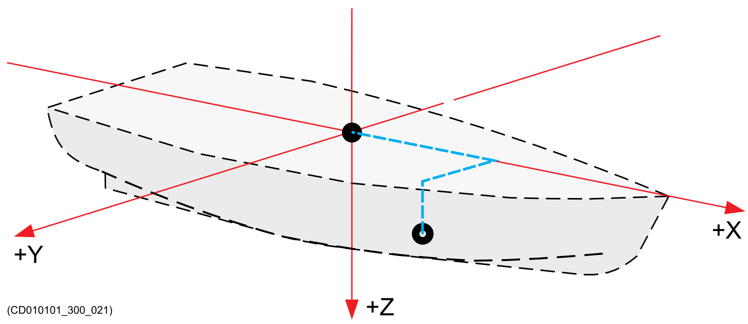
Coordinate system alternative origins

If necessary, other origin locations may be defined for specific products or purposes. One example is the *Navigation Reference Point* that is frequently used. Whenever a vessel is surveyed to establish accurate offset information, the surveyor may also establish an alternative origin location. Whenever relevant, any such alternative locations must be defined using offset values to the "official" origin established by the designer or shipyard. A commonly used alternative origin is the physical location of the vessel's motion reference unit (MRU).

Defining the physical location of each sensor

By means of the vessel coordinate system, the physical location of every sensor can be defined using three numerical values for X, Y and Z. These values must define the vertical and horizontal distances from a single reference point; the origin. The physical location of the motion reference unit (MRU) is often the most important sensor to define. For many systems, the vessel heading is also a critical measurement.

The accuracy of the three numerical values for X, Y and Z defines the accuracy of the sensor data. If you require a high accuracy, for example for underwater positioning, underwater mapping or scientific measurements, you must have each sensor positioned using professional land surveying. For such use, a good alignment survey is critical for high quality results. Surveys are normally done by qualified and trained surveyors using proven survey equipment and methods.

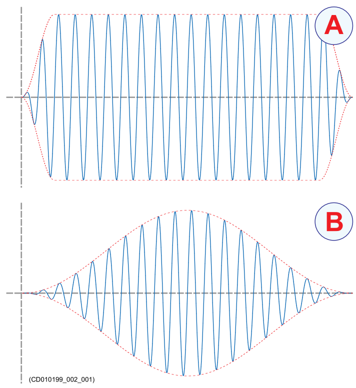


In this example, a second reference point has been established. It is defined with three positive offset values for X, Y and Z. All values are positive because the new reference point is in front of and below the origin, and on the starboard side.

About ramping

The **Ramping** parameter provided in the **Normal Operation** dialog box defines how fast the output level of each transmission ("ping") shall increase from 0 V to maximum level. You have two options; *Fast* and *Slow*.

The principle is shown in the illustration. Curve (A) has **Ramping** set to *Fast*, and the level is increased from 0 V to maximum level using from minimum two (2) up to maximum ten (10) cycles. At the end of the pulse, maximum ten down to minimum two cycles are used to reduce the output level.



The number of cycles used depend on the q-factor (bandwidth relative to centre frequency) for the connected transducer. The number of ramping cycles will be upward limited to the number of cycles in half a pulse length.

Curve (B) has **Ramping** set to *Slow*. The output level is increased from 0 V to maximum level using the first half the pulse duration. The second half of the pulse is then used to reduce the output level.

Advantages

- *Fast* ramping normally means that only the first few cycles of the transmit signal are used to ramp up the signal amplitude and the last few cycles are used to ramp down the amplitude.

  For short pulses, the ramping might converge to *Slow* ramping.

  The advantage with *Fast* ramping is that the transmitted pulse contains more energy relative to the pulse length. This increases the signal/noise ratio. When you apply "chirp", the transmission frequency changes from a low frequency at the beginning of the pulse to a high frequency at the end of the pulse. The combination of chirp and *Fast* ramping will significantly increase the signal/noise ratio.

- *Slow* ramping means that the first half part of the transmit signal is used to ramp up the amplitude and the last half part is used to ramp down the amplitude.

  The advantage with *Slow* ramping is that the pulse have a smooth start and stop. This significantly reduces the transients in to the matched filter and therefore you get reduced side lobes in time (range) at a cost of slightly reduced range resolution at the output of the matched filter for FM pulses.

  The side lobes in time (range) will thus be lower with *Slow* ramping than with *Fast* ramping. Smaller side lobes in time (range) will reduce "crosstalk", as a strong echo from one range will not contaminate weak echoes from other ranges. Increased echo discrimination is particularly useful with echoes of different strength.

A raised cosine window is used as ramping function.

- *Fast* ramping will result in maximal received signal power for a longer effective pulse duration and transmit power, and a wider effective frequency bandwidth than *Slow* ramping.

  Fast ramping is normally used to increase frequency bandwidth, range resolution, and signal-to-noise ratio.
- *Slow* ramping will result in lower matched filtering side lobes in time (range) than *Fast* ramping. *Slow* ramping is normally used to reduce backscatter interference (due to the matched filtering process) between targets closer to each other than one pulse duration (applies in particular to interference from strong targets on weak targets).

  Slow ramping increases and decreases the transmit signal amplitude slowly. This is more "gentle" to the transducer and can sometimes also be used to reduce "ringing" from the transducer.

Ramping when using CW transmission

- *Fast* ramping will result in maximal received signal power for a chosen pulse duration and transmit power than *Slow* ramping. *Fast* ramping is normally used to increase the signal-to-noise ratio.
- *Slow* ramping increases and decreases the transmit signal amplitude slowly. This is more "gentle" to the transducer and can sometimes also be used to reduce "ringing" from the transducer.

Fast ramping is more similar to the ramping type used in the EK60 than *Slow* ramping.

Related topics

Normal Operation dialog box, page 572

Sound speed algorithms

In order to calculate the sound speed and absorption values, the EK80 uses algorithms that are commonly recognized in the scientific community.

Salt water algorithm

The sound speed calculations made by the EK80 for salt water are based on the international standard algorithm, often known as the UNESCO algorithm. This algorithm uses pressure rather than depth, and the EK80 thus provides a conversion from the depth value provided to pressure.

For more information about the algorithm, see the source documents:

1 C-T. Chen and F.J. Millero, *Speed of sound in seawater at high pressures* (1977) Journal of the Acoustic Society of America, Volume 62, Issue 5, pages 1129 to 1135

2 N.P. Fofonoff and R.C. Millard Jr. *Algorithms for computation of fundamental properties of seawater* (1983), UNESCO technical papers in marine science. No. 44, Division of Marine Sciences. UNESCO, Place de Fontenoy, 75700 Paris.

3 G.S.K. Wong and S Zhu, *Speed of sound in seawater as a function of salinity, temperature and pressure* (1995) Journal of the Acoustic Society of America, Volume 97, Issue 3, pages 1732 to 1736

Some websites provide these algorithms online, and may also include interactive versions. One example is:

- http://resource.npl.co.uk/acoustics/techguides/soundseawater/content.htm

Fresh water algorithm

The sound speed calculations made by the EK80 for fresh water are based on Del Grosso's algorithm.

For more information about the algorithm, see the source documents:

1 V.A. Del Grosso, *New equation for the speed of sound in natural waters (with comparisons to other equations)* (1974) Journal of the Acoustic Society of America, Volume 56, Issue 4, pages 1084 to 1091

2 G.S.K. Wong and S Zhu, *Speed of sound in seawater as a function of salinity, temperature and pressure* (1995) Journal of the Acoustic Society of America, Volume 97, Issue 3, pages 1732 to 1736

Some websites provide these algorithms online, and may also include interactive versions. One example is:

- http://resource.npl.co.uk/acoustics/techguides/soundseawater/content.htm

Related topics

Defining the environmental settings, page 122

Absorption algorithm

In order to calculate the absorption values, the EK80 uses algorithms that are commonly recognized in the scientific community.

The absorption calculations made by the EK80 for salt water are based on Francois & Garrison's algorithm.

For more information about the algorithm, see the source documents:

1 J.Simmons and D.MacLennan, *Fisheries Acoustics, Theory and practice* (2005), Second edition, Blackwell Publishing, Oxford, UK, pages 67 to 69

2 R.E.Francois and G.R.Garrison, *Sound absorption based on ocean measurements, Part II; Boric acid contributions and equation for total absorption* (1982), Journal of the Acoustic Society of America, Volume 72, pages 1879 to 1890

Related topics

Defining the environmental settings, page 122

Observation range versus operational frequency

Absorption increases dramatically with frequency in salt water. For maximum observation range you should select a low operating frequency, a large transducer and the maximum transmit power.

The key facts related to observation range versus operational frequncy are:

- Observation range increases when the operational frequency is *reduced*.
- Resolution increases when the operational frequency is *increased*.

If you wish to work in deep waters, you need a low operational frequency.

If you wish to work with high resolution, you need a high operational frequency. The observation range is then limited.

Using the *Simrad ES38B* transducer (38 kHz, 7x7 degrees, 2000 W) you can observe a 60 centimeter cod down to 950 meters, while bottom detection works down to 2800 meters. However, with the *Simrad ES200-7C* transducer (200 kHz, 7x7 degrees, 1000 W) you can only observe that same cod down to 270 meters. Bottom detection becomes unreliable below 500 meters.

Typical observation ranges are shown in the table.

Maximum detection depth (Split-beam transducers)						
Trans-ducers	**Fre-quency (kHz)**	**Pulse du-ration (ms)**	**Band-width (hz)**	**Tx Power (W)**	**Range fish (m)**	**Range bottom (m)**
ES18-11	18	8,21	382	2000	1100	7000
ES38B	38	4,09	766	2000	950	2800
ES70-11	70	2,05	1526	800	450	1100
ES120-7C	120	1,02	3026	1000	440	850
ES200-7C	200	1,02	3088	1000	270	550

Maximum detection depth (Single-beam transducers)						
Trans-ducers	**Fre-quency (kHz)**	**Pulse du-ration (ms)**	**Beam angle (deg)**	**Band-width (Hz)**	**Tx Power (W)**	**Range (m)**
38-7	38	4	7	766	2000	3000
38-9	38	4	9	766	1500	2600
38/200D	38	4	13x21	766	1000	2100

Maximum detection depth (Single-beam transducers)						
Trans-ducers	**Fre-quency (kHz)**	**Pulse du-ration (ms)**	**Beam angle (deg)**	**Band-width (Hz)**	**Tx Power (W)**	**Range (m)**
50/200D	50	2	10x16	1493	1000	1400
50-18	50	2	18	1526	500	1400
50-7	50	2	7	1493	2000	1900
120-15	120	1	10	3026	1000	800
200-7	200	1	7	3088	1000	500
710-36	710	1	2,8	3088	100	70
38/200	200	1	7	3026	1000	450
50/200	200	1	7	3088	1000	450

These range calculations assume a normal sea water salinity (3.5%) and temperature (+10°C), an average bottom (surface backscattering strength = -20 dB) and a noise level typical for a moving vessel.

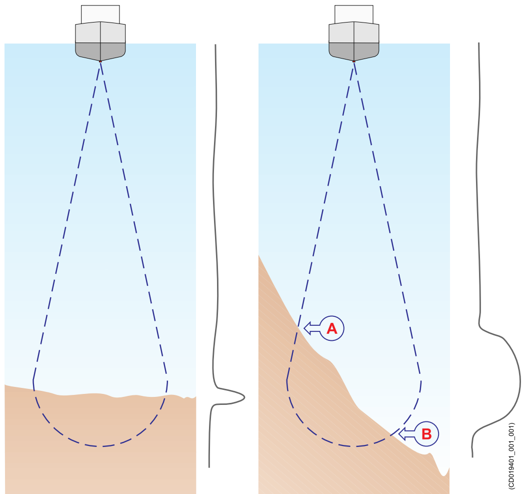
Related topics

Choosing Range and Start Range values in a surface-related echogram, page 118
Choosing Range and Start Range values in a bottom-related echogram, page 120
Range function, page 564
Start Range function, page 565

About bottom echoes

A hard flat bottom reflects the transmitted signal as if it was a mirror. The transmitted pulse hits the illuminated bottom area at nearly the same instant, and the echo from different parts of this area arrive back at the surface also at nearly the same instant. A different situation arises when the bottom is not flat any longer.

The received echo signal is basically an attenuated copy of the transmit pulse. The echo signal from a sloped bottom is characterized by having a longer duration and a slower rise and fall time. The transmitted pulse first hits the slope at point (**A**), and as time elapses the reflection point travels along the slope towards point (**B**).



Many locations do not have a solid hard bottom. Frequently, the bottom is composed of layers of mud, clay and sand which can be observed as coloured bands in the EK80 echograms.

The bottom detection algorithm is implemented solely in software, and separate algorithms are run for each frequency channel. The algorithm is designed with emphasis on reliability in the sense that erroneous depth detections are never shown. Whenever the quality of a detection is questionable the algorithm outputs a depth of *0.00* to indicate that no reliable detection was obtained.

The EK80 algorithm is designed to handle a number of difficult situations. The algorithm maintains bottom lock for a discontinuous jump in bottom depth. It avoids false bottom detections on for example a dense school of fish. The algorithm chooses the upper boundary of the first layer when the bottom consists of layers.

The bottom detection algorithm locks to the first good bottom return. The depth at point **A** rather than the depth along the transducer axis will be output for a sloped bottom. The detected depth value is always smaller than the depth along the transducer axis implying that a safety margin is automatically included.

Related topics

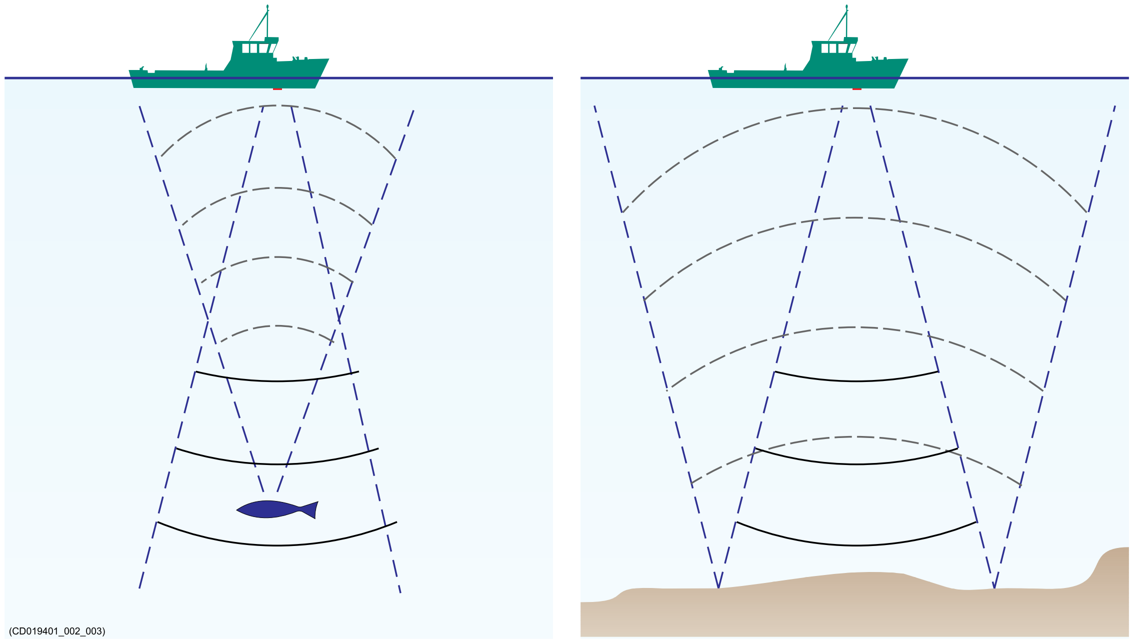
Choosing Range and Start Range values in a surface-related echogram, page 118
Choosing Range and Start Range values in a bottom-related echogram, page 120
Range function, page 564
Start Range function, page 565

About sound wave propagation

The velocity of sound wave propagation in the sea varies slightly with temperature, salinity and pressure.

The velocity varies between 1440 and 1520 m/s in shallow sea water, while a velocity around 1480 m/s can be expected at 1000 m depth. In shallow fresh water the velocity is approximately 1430 m/s. Unless you have a relevant sensor available, a good average sound speed value is 1470 m/s.

The EK80 transmits high energy sound wave pulses into the sea. A flat bottom reflects the transmitted wave as if it was a mirror. The propagating energy is spread over a larger and larger area as it travels down to the bottom and up again. The energy is spread over a four times larger area every time the travel distance doubles.



A large school of fish reflects sound waves similarly. This type of spreading is referred to as *square-law* or *20 log TVG* (Time Variable Gain) spreading. In the **Echogram** dialog box *20 log TVG* spreading is referred to as *School Gain* and *Bottom Gain*, while *40 log TVG* spreading is referred to as *Fish Gain*.

The situation is slightly different when observing the echoes from individual fish.

The transmitted wave undergoes square-law spreading when travelling from the surface and down to the fish. The swim bladder of the fish scatters a small fraction of the arriving energy in all directions. Travelling from the fish and back towards the surface the scattered wave undergoes another square-law spreading.

The combined effect is referred to as *quad-law* or *40 log TVG* (Time Varying Gain).

Propagation losses due to absorption are much higher in sea water than in fresh water. Absorption also increases with frequency. At 38 kHz the absorption is 0.5 dB/km in fresh water and 10 dB/km in sea water. At 200 kHz the absorption is 10 dB/km in fresh water and 50 dB/km in salt water. The EK80 must know which water type is present in order to compensate for these losses correctly.

The dB (decibel) unit has long traditions in underwater acoustics and other fields in physics. It is a logarithmic measure for the ratio between two quantities.

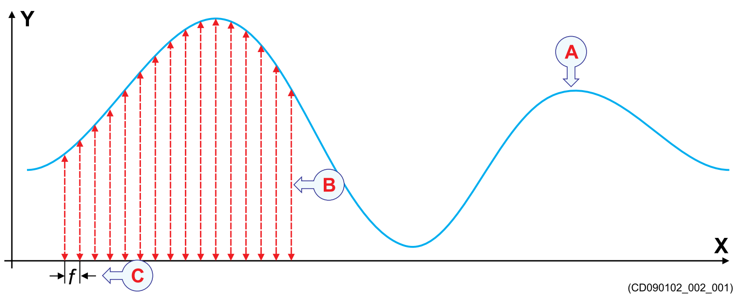
What is sampling?

The information from each EK80 transducer is a continuous flow of analogue data. In signal processing, *sampling* is the reduction of this continuous signal to a discrete signal.

A common example is exactly what we do in the EK80. We convert a sound wave (which is an analogue *continuous-time signal*) to a sequence of samples (which is a *discrete-time signal*).

A discrete (or discrete-time) signal is a sequence of data capsules. This typically a signal that has been sampled from a continuous-time signal.

Unlike a continuous signal, a discrete signal is not a function of a time argument, but a sequence of quantities, a function over a domain of discrete integers. Each value in the sequence is called a *sample*.



In this coordinate system, the Y-axis is voltage (or "volume") and the X-axis is time.

A This is a continuous flow of data, an analogue signal, for example an echo.

B This line identifies the samples that the system is extracting from the analogue signal. Each sample is identified with the time it was taken. It will contain the value of the analogue signal at that time.

C The distance between each vertical line is the time between each sample. This time is identified as the *sampling rate*.

Using this technique, the analogue signal is converted to a stream of discrete signals.

Acoustic noise

As with any other hydroacoustic systems, the quality of the EK80 echo data and presentations are subject to unwanted acoustic noise. The echoes from any large and small target must be detected inside the noise.

Topics

Contributing factors

Several factors are contributing to the performance of the hydroacoustic equipment used on board a vessel.

Factors contributing to the performance of the hydroacoustic equipment used on board a vessel are:

- The quality and properties of the transmitted signal
- The quality of the receiving system
- The operational settings made during operation
- The properties of the target(s)
- The signal-to-noise ratio

The majority of these factors can neither be controlled nor improved by means of installation methods or transducer locations. The quality and properties of the transmitting and receiving systems are key factors during our product development, while our end user documentation aims to help the user to make the right filter settings during operation. As for the target properties, there is nothing any of us can do with those.

The *signal-to-noise ratio*, however, can be improved by making the correct choices during installation.

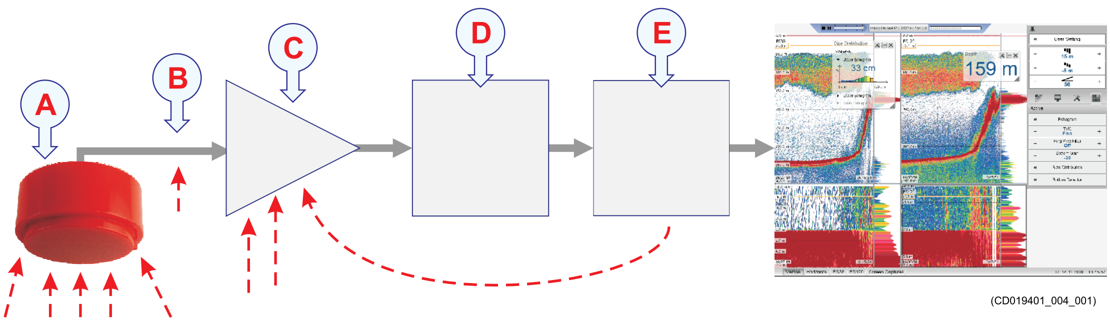
> Signal-to-noise ratio (often abbreviated SNR or S/N) is a measure used in science and engineering that compares the level of a desired signal to the level of background noise. It is defined as the ratio of signal power to the noise power, often expressed in decibels. A ratio higher than 1:1 (greater than 0 dB) indicates more signal than noise. While SNR is commonly quoted for electrical signals, it can be applied to any form of signal [...].

Wikipedia, Copied September 2013

The *signal* is the echo that we want to know something about, while the *noise* is any unwanted signals or disturbances. The echo must be detected in the noise and therefore it is necessary to keep the noise level as low as possible in order to obtain high interpretation.

The noise that contributes to the signal to noise ratio may be divided into the following types of noise:

- Self noise
- Ambient noise
- Electrical noise
- Reverberation
- Fishing gear noise



(CD019401_004_001)

A The transducer can pick up noise from

- Biological disturbances
- Interference
- Cavitation
- Propeller noise
- Flow noise
- Acoustic noise from other hydroacoustic systems

B The transducer cable is long, and may pick up electric noise from generators, pumps, cooling systems and other electric or electromechanical devices.

C The preamplifiers are very sensitive, and they can easily pick up electrical noise from internal and external power supplies. The preamplifiers are also vulnerable to analogue noise created by their own electronic circuitry. Digital noise created by the converter and processing circuitry can also create problems.

D Converters transform the analogue echoes to digital format.

E Signal processing circuitry can create digital noise.

Related topics

Acoustic noise, page 771

Self noise

Any vessel equipped with a hydroacoustic system (for example echo sounder or sonar) will produce more or less self noise.

There are many sources of such self noise. We will here go into some details in order to analyse the different sources of self noise on a vessel and how they may influence upon the noise level of the hydroacoustic instruments.

Machinery noise

The main contributor to machinery noise is usually the main engine on board the vessel. The contribution from auxiliary machinery may, however, be considerable, especially if it is in poor shape. The machinery noise can be transmitted to the transducer as:

- Structure-borne noise through the ship structure and the transducer mountings
- Water-borne noise through the hull into the water to the transducer

Electrical noise

Modern vessels are normally equipped with a lot of electric instruments such as hydroacoustic systems, radars, navigation systems, and communication equipment. Any electric instruments may in some cases cause electrical interference and noise. International regulations and certifications are used to control and reduce this, but even these are limited if the electrical systems are poorly installed and/or maintained.

Propeller noise

Propeller noise is often the main source of noise at higher vessel speeds. Variable pitch propellers or fast moving propellers usually make more noise than fixed propellers or slow moving propellers.

Propeller noise is usually water-borne. In some cases, however, shaft vibrations or vibrations in the hull near the propeller may be structure-borne to the transducer. If a propeller blade is damaged, this may increase the noise considerably.

Propeller cavitation is a severe source of noise. "Singing" propellers might be a source of noise, which interferes at discrete frequencies. In some cases static discharge from the rotating propeller shaft may be quite disturbing.

Cavitation

Cavitation is the formation of small air bubbles close to the transducer face. The bubbles appear because the local pressure becomes negative during parts of the acoustic pressure cycles. The cavitation threshold increases with the hydrostatic pressure. The noise is made when the bubbles implode.

Cavitation noise may appear near extruding objects at higher speeds, but more often it is caused by the propellers. Propeller cavitation is a severe source of noise. The cavitation starts when the water flows in the same direction as the propeller blades. This is where the propeller blades move downwards.

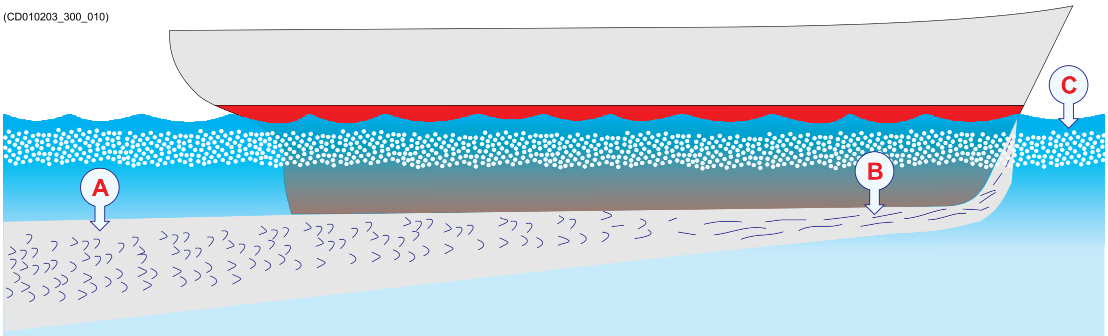
In some cases a resonant phenomenon is set up in a hole near the hull. This sound will have a discrete frequency, while all other flow noise will have a wide frequency spectrum.

(Image from U. S. Navy in the public domain.)

Flow noise

The upper water layers of the sea contain a myriad of small air bubbles created by the breaking waves. When the hull moves through water it will cause a disturbance, and this will generate friction. The friction zone is called the *flow boundary layer*. The flow in this boundary layer may be *laminar* or *turbulent*.

- The *laminar* flow is a nicely ordered, parallel movement of the water.
- The *turbulent* flow is a disorderly flow pattern, full of eddies.



A *Turbulent flow*

B *Laminar flow*

C *Air bubbles*

Air bubbles absorb and reflect the sound energy, and they may in worst cases block the sound transmission altogether.

The boundary layer increases in thickness when it becomes turbulent. The boundary layer is thin in the forward part of the vessel hull, and increases as it moves aft. The thickness depends on ships speed and on the roughness of the hull. All objects sticking out from the hull, or dents in the hull, will disturb the flow and will increase the thickness of the boundary layer. When the flow speed is high, the turbulence can be violent enough to destroy the integrity of the water. Small voids or cavities in the water will occur and this is called cavitation.

Rattle noise

Rattle noise may be caused by loose objects in the vicinity of the transducer, like fixing bolts. The rattle may also come from loose objects inside the hull.

Interference

Interference from other hydroacoustic equipment on board the same vessel may be an annoying source of disturbance. Unless the same frequency is used for more than one piece of equipment only the transmitted pulse will contribute to the interference.

> In physics, interference is the phenomenon in which two waves superpose each other to form a resultant wave of greater or lower amplitude. Interference usually refers to the interaction of waves that are correlated or coherent with each other, either because they come from the same source or because they have the same or nearly the same frequency. Interference effects can be observed with all types of waves, for example, light, radio, acoustic, surface water waves or matter waves.
>
> *https://en.wikipedia.org/wiki/Interference_(wave_propagation), April 2016*

Related topics
Acoustic noise, page 771

Ambient noise

Ambient noise is usually not a limiting factor to the performance of sonars and echo sounders.

The ambient noise may be split up as follows:

- **Sea noise**: Air bubbles, seismic disturbances, waves, boundary turbulence, etc.
- **Biological noise**: Fish, mammals
- **Man made noise**: Other vessels, interference
- **Precipitation noise**: Heavy rain or hail

In some areas, where many vessels operate together, the engine and propeller noise from other vessels may be disturbing. Interference from hydroacoustic instruments located in other vessels may also be a limiting factor. The sea noise depends on the weather conditions. In bad weather the sea noise can be quite high due to the waves.

Related topics
Acoustic noise, page 771

Fishing gear noise

Whenever your fishing gear is in use, it will create noise.

A bottom trawl, for instance, is a considerable source of acoustic noise. Still, this noise from the fishing gear will seldom be a limiting factor for hull mounted sonars or echo sounders. However, for operation of a catch monitoring system or a trawl sonar, with the transducer placed on the trawl, the gear noise is one of the main contributors to the noise level.

Related topics
Acoustic noise, page 771

Electrical self noise

Electrical or electronic self noise is picked up or generated in any other part of the equipment than the transducer.

Hum picked up by the transducer cables or picked up from the power supply is usually the most common source of electrical self noise. At higher frequencies – where rather wide bandwidths are necessary – the noise from components, transistors or other analogue electronic may be a limiting factor.

Related topics
Acoustic noise, page 771

Some means to reduce acoustic noise

Several factors are contributing to the performance of the hydroacoustic equipment used on board a vessel. Careful planning of the EK80 installation may reduce the acoustic noise.

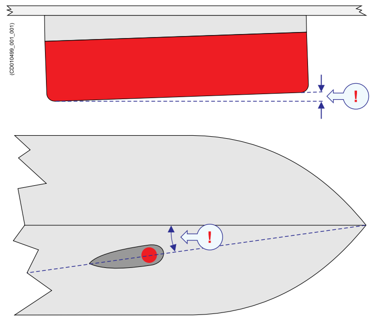
Unfortunately, it is impossible to simply provide a number of specific procedures to reduce the noise.

An important factor is the physical location of the transducers. This depends on the vessel's design and construction, how the hull is shaped, and how the water runs along the hull. Other factors deal with other equipment mounted on board, and this will also be vessel dependant. At moderate ship speeds the machinery noise is usually dominant. At medium speeds the flow noise increases more rapidly and takes over, while at higher speed the propeller noise will be the main contributor.

Note

The information here must be considered as general advice. Each EK80 installation must be handled separately depending on the hull design and the other electrical and mechanical systems installed on the vessel.

Reducing flow noise



- The shape of the transducer (or dome around it) must be as streamlined as possible.
- The hull plating in front of the transducer must be as smooth as possible.

  Important

  Be especially aware of bilge keels and zinc alloy anodes. The keel must be rounded off without sharp edges. Neither extruding objects nor abrupt transitions must be present.

- Each transducer must be mounted with a small inclination angle (approximately 2 degrees).

Reducing machinery noise

- Each transducer must be installed as far away from the engine room as possible.
- The main engine and relevant auxiliary engines and equipment must be fixed to rigid foundations to avoid vibrations.
- Any hull structure that may vibrate should be damped or coated to reduce the vibrations.

The use of shock absorbers or floating rafts may sometimes reduce this noise. The structure-borne noise may be reduced by isolation, for example by providing vibration clamping between the transducer and the hull structure.

Reducing propeller noise

- Each transducer must be installed as far away from the propellers as possible.
- Sufficient clearance between the propellers and the hull, the rudder and the keel must be provided.
- Place the zinc alloy anodes in places where the water flow is the least disturbed.
- Ensure that the propellers blades are correctly designed and without damages.
- The use of a baffle between the propellers and the transducer may reduce noise appreciably.
- Static discharges caused by the rotating propeller shaft may be removed by proper grounding or by mounting a coal brush from the shaft to vessel ground.

Reducing rattle noise

Ensure that no parts near the transducers can rattle as a result of water flow or vibrations.

Reducing interference

Interference from the transmission pulses from other hydroacoustic instruments on board the vessel is difficult to avoid. The problem may be reduced by choosing the working frequencies carefully and to some extent by separating the different transducers. On vessels with a large number of separate hydroacoustic systems installed and in simultaneous use, a separate synchronizing system (for example the K-Sync) should be considered.

Reducing electrical noise

- Place the transducer cables in a metal conduit from the transducer to the Wide Band Transceiver (WBT). Terminate the conduit as close to the transducers and Wide Band Transceiver (WBT) as possible.
- Make sure that all units are properly grounded, as this is important to avoid electrical noise.
- Use shielded cables with correct grounding.
- Separate EK80 cables from other cables with high voltages, large currents or transients. Place all high voltage power cables in metal conduits.

Related topics

Acoustic noise, page 771

Acoustic Doppler current profiler

Topics

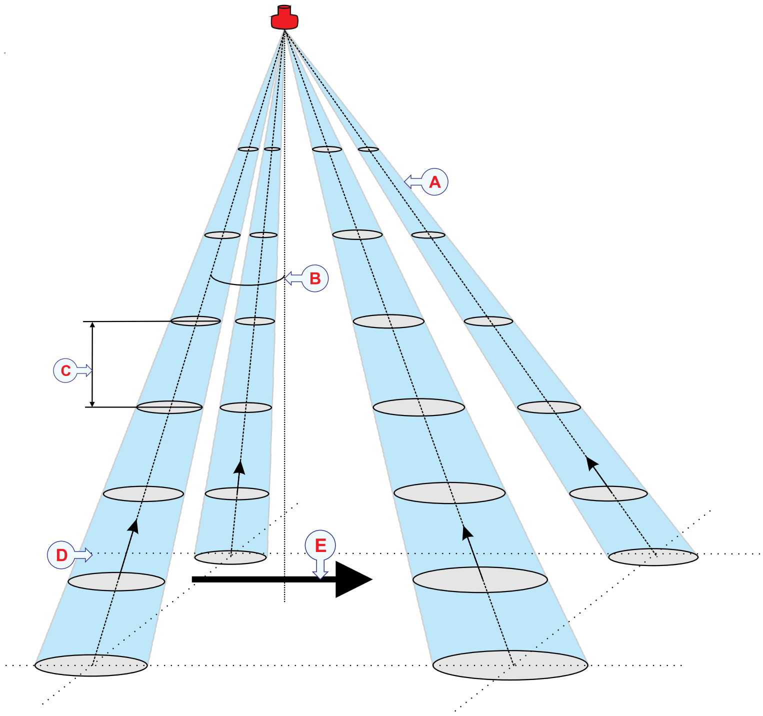
ADCP Introduction

Measurement of current velocity using ADCP is based on the principle of Doppler shift. The Doppler effect (or the Doppler shift) is the change in frequency of a wave in relation to an observer who is moving relative to the wave source. A common example of Doppler shift is the change of pitch heard when a vehicle sounding a horn approaches and recedes from an observer. The reason for the shift in frequency is that the sound source moving towards the observer will transmit each sound wave a little bit closer to the observer all the time. Each wave therefore takes slightly shorter time to reach the observer. When the transmitter has passed the observer, each sound wave will have to travel a little bit longer to reach the observer.

An acoustic Doppler current profiler (ADCP) system measures current velocity, speed and direction. The system uses a transceiver which transmits high frequency sound waves (beams). The transceiver determines the Doppler frequency shift of the return signal. The return signal is scattered from “drifters” in the water column. The drifters are species of planktonic organisms such as euphasiids and copepods.

Important

The drifters moves passively with the same velocity as the water current. The velocity of the water current is assumed homogeneous in the different levels of the water column. The frequency of the reflected sound is increased (or decreased) in direct proportion to the rate at which the drifters are approaching the instrument.



A The array transducer for ADCP uses four beams.

B The angle between the centre line of each beam and the vertical line from the transducer is approximately 30 degrees.

C **Depth Cell** - Velocity estimates at each depth are found by using the echoes from one depth cell.

D The arrows mark 3D velocity components in a beam. Velocity measured in the beam's directions are used to estimate velocity components.

E Water current flow

The ADCP system provides three major different types of data.

- Vessel speed when moving over the sea floor, also known as bottom-tracking.
- Water current velocity in the water column. Water current velocity is measured in both vertical and horizontal direction.
- Movement of fish and fish schools through the water.

The ADCP data can be used in navigation, oceanography and fishery research.

The maximum range of the ADCP transducer corresponds to the location where the signal strength drops to levels comparable to the noise level. Beyond this range the ADCP cannot accurately calculate Doppler shifts.

Related topics

Acoustic Doppler current profiler, page 779
Exploring water velocities using ADCP, page 197
Adjusting the ADCP quality parameters, page 207
ADCP information pane description, page 490

Doppler shift

Measurement of current velocity using ADCP is based on the principle of Doppler shift. The Doppler effect (or the Doppler shift) is the change in frequency of a wave in relation to an observer who is moving relative to the wave source. A common example of Doppler shift is the change of pitch heard when a vehicle sounding a horn approaches and recedes from an observer.

The Doppler shift principle is used in ADCP to measure the speed and direction of water current velocities. The ADCP transducer elements emit a series of sound waves at a specific frequency. The echo is received by the ADCP system receiver and processed. The echo is received by the ADCP system receiver and processed. The Doppler effect will result in a frequency shift or a time dilation for the received echo. The frequency shift of the echoes reflected from the drifters is proportional to the speed of the water current.

```
Fd = 2Fs*(V/C)
```

- **Fd**: The Doppler shift frequency [Hz].
- **Fs**: Frequency of the transmitted sound waves from the ADCP transducer [Hz].
- **V**: Relative velocity between the sound source and the sound receiver in the beam direction [m/s].
- **C**: Sound speed [m/s]

Doppler shift may also be explained using time dilation. This means the changes to the signal in terms of time rather than frequency is proportional to the speed of the drifters. The echo from a pulse of sound transmitted towards a particle will look the same when the particle is still. If the particle moves away from the transmitter the distance it takes for the echo to travel back is a little longer for the end of the pulse compared to the start of the pulse. Thereby the received pulse is a stretched version of the transmitted. If the pulse is a sinusoidal, we will see that the stretching of the pulse has given it a lower frequency, a frequency shift.

Related topics

Acoustic Doppler current profiler, page 779
Exploring water velocities using ADCP, page 197
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ADCP information pane description, page 490

Depth cells

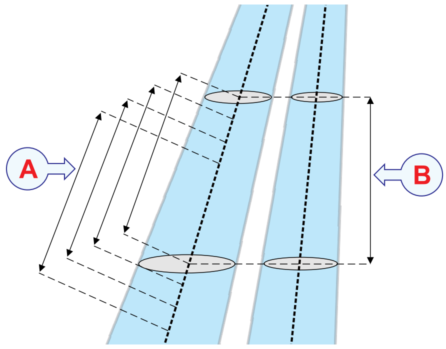
In water current measurements, the phrase *cell* is used to describe a *depth cell* (sometimes referred to as *bins*). These are uniform segments used by the acoustic Doppler current profiler (ADCP) to measure the velocity of the current.

The acoustic Doppler current profiler (ADCP) measures the speed and direction of the water current by means of acoustic pulses. These pulses have duration decided by the current size of the *depth cell*. Each beam can be seen as a number of depth cells evenly placed from the transducer surface and down to the lower end of the acoustic beam.

The size of the depth cells can be adjusted in the **Normal Operation** dialog box.

- Use smaller depth cells in shallower waters.
- Use larger depth cells in deeper waters.

A small depth cell offers better range resolution. This makes it is easier to detect minor depth variations in the current velocity. On deeper waters, a small depth cell will gradually suffer from more and more noise. The ping rate will also be reduced due to the high amount of processing that is required. A larger depth cell tolerates more noise. For this reason, larger depth cells must be used to measure velocity in deep waters.



A *The ranges covered by succeeding depth cells are overlapping.*

B *Depth cell size*

To make the measurements, the EK80 creates *depth cells* along the beam. The vertical size of each depth cell is defined by the **Depth Cell Size** setting. The ranges covered by succeeding depth cells are overlapping. You can regard the depth cells as different "snap shots" of one cell sliding along the beam. The backscatter data from each depth cell is used to measure the velocity within that depth cell.

This "sliding cell method" offers smoother velocity results in the ADCP views. By processing the echo data from the entire beam, the EK80 is able to present an accurate velocity profile of the column covered by the beam.

Related topics

Acoustic Doppler current profiler, page 779
Exploring water velocities using ADCP, page 197
Adjusting the ADCP quality parameters, page 207
ADCP information pane description, page 490

Current velocity

Water current velocity is measured in each of the beams of the ADCP transducer. Through processing the velocities relative to the vessel (Vessel Velocity) and to earth coordinates (Geographical) are calculated. The effect of the vessel speed is removed from the measured velocities. The result is water current velocity estimates throughout the entire water column of the beams.

The most important feature of any ADCP sensor is its ability to measure current profiles and current velocities. The sensor divides the velocity profile into uniform depth cells (bins). By means of the sliding average method it creates a current velocity profile of the water column. A number of factors and processes are involved in this measurement.

Relative velocity between sea and transducer is measured in each of the four beams. Each beam can only measure the velocity along the beam. Like a telescope with a narrow focus, it can only "see" things along its line of sight. This may be towards the ADCP transducer or away from it, but only along the beam.

This velocity is referred to as *beam velocity*. The beam velocity is estimated through the water column in the beam using uniform *depth cells* along the beam. The acoustic transmissions emitted by the transducer produce echoes, and these are retuned to the receiver. These echoes are subjected to a Doppler shift, and provide information about the current velocity. In order to create a current velocity profile echoes from the entire range of the beam must be processed by the receiver. This involves continuous processing of the echo data. Echoes from larger ranges take longer to return than echoes from closer ranges.

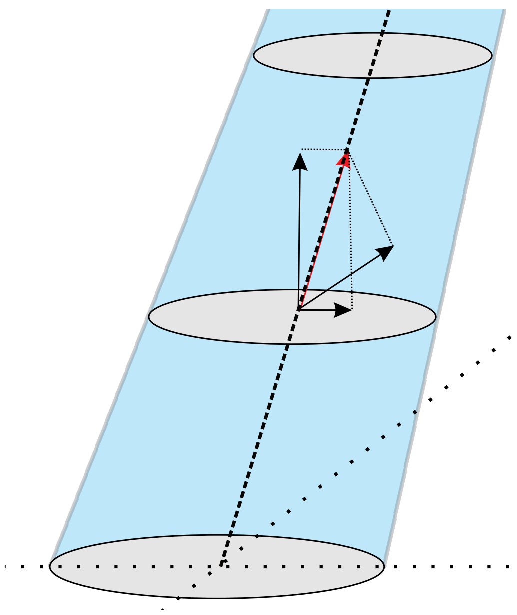
Tip

The size of the depth cells can be adjusted in the **Normal Operation** *dialog box.*

- *Use smaller depth cells in shallower waters.*
- *Use larger depth cells in deeper waters.*

Illustration:

The current velocity is commonly displayed as an arrow. The length of the arrow represents the magnitude of the velocity while the tip of the arrow indicates the direction. The current velocity can be broken down into components in three dimensions. Displaying the horizontal and vertical component of the current velocity provides a visualisation of the displacement of the current in these directions. This is useful in order to estimate the relative current velocity in the cardinal directions or relative to the vessel orientation, as well as to estimate the current velocity in the up/downward direction. GPS and MRU data are used to find the transducer's velocity.



The beam velocities along the four beams are combined to find the two horizontal and the vertical velocity components, in addition to the error velocity. Knowledge about the installation angles of the transducer makes it possible to transform the estimated velocity to vessel coordinates. Data from MRU and GPS (roll, pitch and heading) are used to transform the velocity to global coordinates. Since the ADCP measured velocity at this stage is the relative velocity between sea and transducer, transducer's velocity has to be removed to get the current velocity. The transducer's velocity is removed, and the output is the current velocity in global coordinates.

Related topics

Acoustic Doppler current profiler, page 779
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ADCP data

The ADCP measures relative velocity between sea and transducer along each beam, this is the beam velocity.

The beam velocities along the four beams are combined to find 3D-velocity vectors, these 3D-vectors are transformed to vessel coordinates, and the result is the Vessel velocity.

Using data from GPS and MRU, the Vessel velocity is transformed to global coordinates and the transducer's velocity is removed, the result is the Global current velocity.

Velocity data

Velocity data are output in units of m/s or knots.

- **Beam velocity**

  Beam velocity is the relative velocity between sea and transducer measured in the beam direction. The relative velocity between the sea and transducer will have a component along the beam direction. This component is measured in the beam velocity.The *Beam Velocity* presentation includes one view for each beam. This velocity is often referred to as relative to beam coordinates.

- **Vessel velocity**

  Vessel velocity is 3D velocity found from the beam velocity and relative to the directions of the vessel, fore/aft, port/starboard. The movements of the transducer is included in this velocity estimates. The **Vessel Velocity** views include one view for velocity in the fore/aft direction, one for port/starboard direction, one for speed (i.e. no direction indicated) and one for up/downward velocity. This is often referred to as velocity relative to vessel coordinates.

- **Geo velocity**

  Geo velocity is current velocity estimated from the vessel velocity and relative to the cardinal directions, north/south east/west. The movements of the transducer are removed from these estimates. The **Geo Velocity** views include one view for north/south direction, one for east/west direction one for current speed (i.e. no direction indicated) and one for up/downward velocity of the current. This is often referred to as velocity relative to earth coordinates.

- **Error velocity**

  Error velocity is the difference between to estimates of vertical velocity. It is calculated using beam velocity data. The differences in vertical velocity estimates can be due to inhomogeneities in the water velocity, noise or malfunctioning equipment.

Correlation data

Correlation is a measure of similarity between the two sets of received echoes from which the velocity along each beam direction is estimated.

If the difference is small, correlation is high and the signal sequences are similar. When **Correlation** is enabled, velocity estimates with correlation below the threshold value are edited out. This means these velocity estimates will not be shown in the velocity views and not included in ping average. Set the correlation threshold value to remove noisy measurements for correlations values lower than the threshold value.

Percent good data

The **Percent Good** data is a measure of what fraction of velocity data which passed the error velocity and correlation threshold tests. The percent good fraction is calculated using the number of pings selected in **Ping Average**.

Percent good is used for **Vessel Velocity** and **Geo Velocity**. **Beam Velocity** does not use this quality measurement.

It tells what fraction of pings passed both the error velocity and correlation threshold editing.

The percent good fraction is calculated using the number of pings selected in **Ping Average**. When calculating ping average, only the velocities which have passed the error velocity and correlation editing are included. The percent good threshold sets the lower limit for what fraction of pings must have passed the other threshold edits. Averaged velocities, ADCP data, with percent good below this limit are not shown in the velocity views.

Backscatter data

The ADCP is designed to measure currents, but it can also be a useful tool for investigating the distribution and abundance of zooplankton in the water. Backscatter views are displayed with a true depth scale. (Compensating for the 30deg steering of the beams).The intensity of the backscattered soundwaves for each depth cell is a “snapshot” of the echo intensity at a distance of two-thirds the way along the depth cell. This can be used to estimate the integrated mass of the backstterers over the footprint volume (width and thickness) of the original acoustic beams.

Related topics

Acoustic Doppler current profiler, page 779
Exploring water velocities using ADCP, page 197
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Ping average using sliding average

Random errors can be reduced using a sliding average over a subset of the pings.

The ADCP works by transmitting pings of sound at a constant frequency into the water. Using the Doppler shift and measuring the time it takes for the echo to bounce back to the ADCP receiver the current velocity is calculated. Using single pings to calculate ADCP data may result in velocity errors which are too large to meet the measurement requirements. Therefore the **Ping Average** function can be used in a *sliding average* of pings to calculate the velocity data. The calculation then relies on a fixed subset size, **Ping Average**, and a series of pings. The first average is obtained by taking the average of the initial fixed subset of the ping series. Then the subset is modified by shifting forward, that is, excluding the first ping of the ping series and including the next ping in the series.

The **Ping Average** function has effect on the quality measurements of the ADCP data. **Error Velocity**, **Correlation** filtering is performed using individual pings. Pings which matches the threshold values of these parameters or have a higher quality are used for estimating velocity. **Error Velocity**, **Correlation** filtering is performed using individual pings. Pings which matches the threshold values of these parameters or have a higher quality are used for estimating velocity. **Percent Good** only uses pings which have already passed **Error Velocity** and **Correlation** and makes a ping average calculation of these pings to estimate the Percent Good fraction of the velocity data.

A sliding average smooths out short-term fluctuations and highlights longer-term trends in the ADCP views which are produced from the data.

Related topics

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Reference Manual