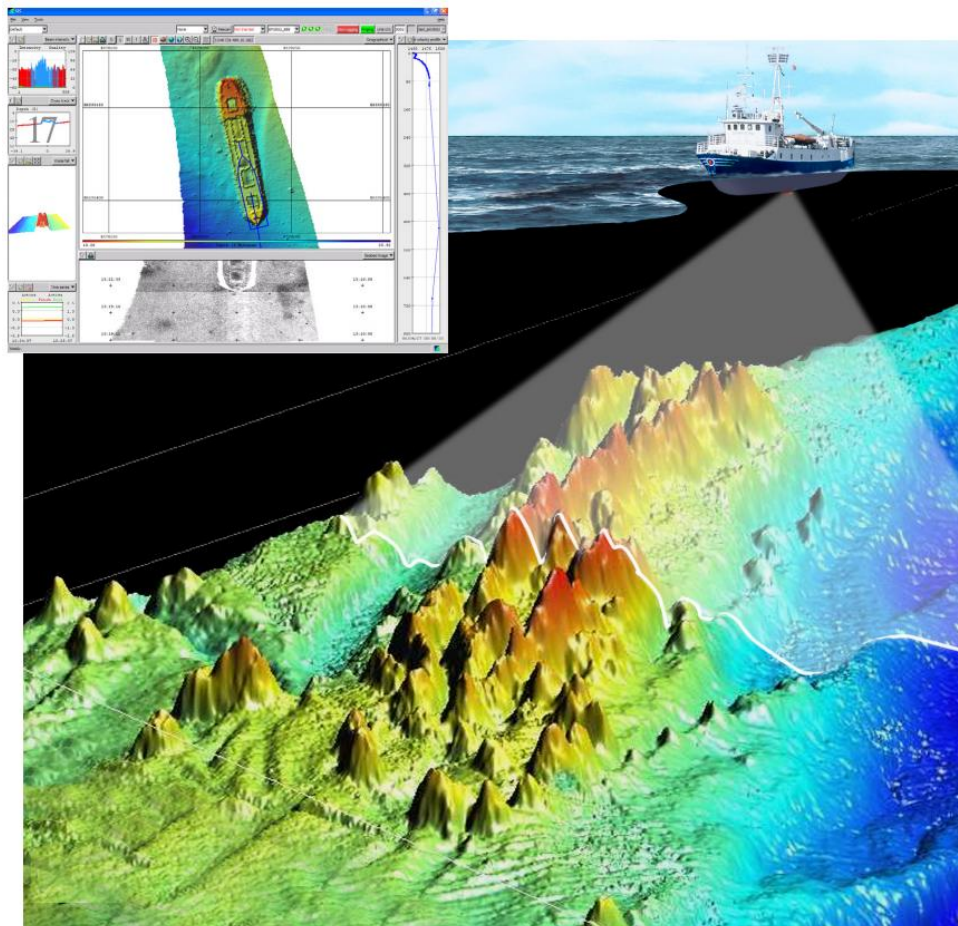


Quick Start Guide for Multibeam Kongsberg EM 712 on RV “Heincke”



Source: Kongsberg SIS Operator Manual

Contact:

FIELAX Gesellschaft für wissenschaftliche Datenverarbeitung mbH

Schleusenstr. 14, D-27568 Bremerhaven, GERMANY

Fon: +49 (0)471 30015-0, Fax: +49 (0)471 30015-22

Mail: echo-support@fielax.de

Ref.: RV-Heincke_Multibeam-Support.pdf	Vers.: 2.3	Date: 01.04.2026	Status: final
--	------------	------------------	---------------

Bank Account: WESPA | IBAN: DE17 2925 0000 0004 0162 20 | BIC: BRLADE21BR
 VATIN: DE221948243 | Tax No: 60/137/00794 | FA Bremen
 Comm. Reg.: HRB 3506 AG Bremen | Managing Director: Dr. Regina Usbeck



Contents

1	Introduction	4
2	Hardware configuration	4
2.1	Sensor equipment.....	4
2.2	Sensor structure	4
2.3	Sensor layout / alignment	5
3	SIS – Kongsbergs Acquisition Software	8
3.1	Start SIS (SIS Operator Manual - page 94).....	8
3.2	Start a new survey	9
3.3	Using background data	11
3.4	Check runtime parameters.....	11
3.5	Start the echo sounder	12
3.6	Start and stop pinging	13
3.7	Start and stop logging	13
3.8	Plan a new job	14
3.9	Run the survey	14
3.10	Interferences and External Triggering	15
3.11	Remote Control / Watch using VNC.....	16
4	Sound velocity measurements	16
4.1	Operate Valeport MIDAS SVP	16
4.2	SVP editor	18
5	Post Processing in CARIS HIPS.....	21
5.1	Create a new HIPS project	22
5.2	Subset editor	24
5.3	Georeference Bathymetry/Merge & GPS tide data.....	25
5.4	Create new bathymetry surface	28
5.5	Export data	29
6	Tips and tricks	29
6.1	Planning survey lines in SIS	29
6.2	Line spacing	30
7	Appendix	32
7.1	Latest Service and Calibration Report HE612_2 (14.-15.02.2023).....	32



History

Version / Date	Description
1.0 / 03.03.2010	First version
1.1 / 15.02.2013	Chapter 2.3 Sensor layout / alignment: Update of location offsets
1.2 / 15.04.2013	Added Chapter 3.11, External Triggering
1.3 / 05.02.2014	Added Chapter 3.3, background data
1.4 / 26.11.2014	Added Chapter 3.10, INS heave calculation
1.5 / 02.09.2016	GPS sensor naming & EM710 calibration parameters
1.6 / 17.02.2017	Updated position for GPS sensor "Trimble"; new calibration report (7.1); new chapter 3.12 on how to use VNC
1.7 / 05.03.2019	New calibration report
1.8 / 02.03.2020	New calibration report
1.9 / 10.02.2022	Updated report due to new EM & SIS version
2.0 / 28.02.2023	Updated start procedure & report due to new patch test values
2.1 / 17.12.2024	Updated Caris HIPS Processing Procedure
2.2 / 04.03.2025	New calibration report and minor changes at Processing Procedure
2.3 / 01.04.2026	New calibration report and updated SIS screenshots



1 Introduction

This manual intends to give the scientific user of the multibeam echosounder system on board RV “Heincke” a brief overview including the configuration, operation and a quick step-through for data processing in CARIS HIPS.

2 Hardware configuration

2.1 Sensor equipment

The following sensors are installed on the FS “Heincke”:

Table 1: Sensor specifications

Sensor	Model	Details from Manufacturer
Inertial Navigation System (INS)	IXSEA PHINS III	Heading accuracy: 0.05 deg (without aiding) Roll, Pitch accuracy: 0.01 deg Heave accuracy: 5 cm or 5%
Primary Positioning Sensor	Trimble SP461	Primary Positioning system DGPS 0.5 – 3 m accuracy
Backup Positioning Sensor	SAAB R5	Backup Positioning system DGPS GPS: 3m, DGPS: 1m (2D RMS)
Thermosalinograph (TSG)	Seabird SBE21+SBE38	Provides calculated sound velocity
Sound Velocity Transducer Probe (SVT)	Valeport miniSVS	Range: 1375 – 1900 m/s Resolution: 0.001 m/s, Accuracy: ± 0.02 m/s
Sound Velocity Profiling Probe (SVP)	Valeport MIDAS	Range: 1375 – 1900 m/s Resolution: 0.001 m/s, Accuracy: ± 0.02 m/s

2.2 Sensor structure

Figure 1 shows the sensor structure of the multibeam echosounder hardware. The processing unit is the main unit which controls the transmitter, gets the sounding data from the receiver, and receives position information from the Trimble DGPS receiver as well as attitude data (heading, roll, pitch, heave, velocity-z) from Ixsea PHINS III inertial navigation system (INS). Sound velocity at transducer level is provided by the thermosalinograph (TSG) via DSHIP. A backup sensor is a sound velocity transducer (SVT) probe. For measuring vertical sound velocity profiles in the water column you may use the shipboard CTD or the sound velocity profiling probe (SVP).

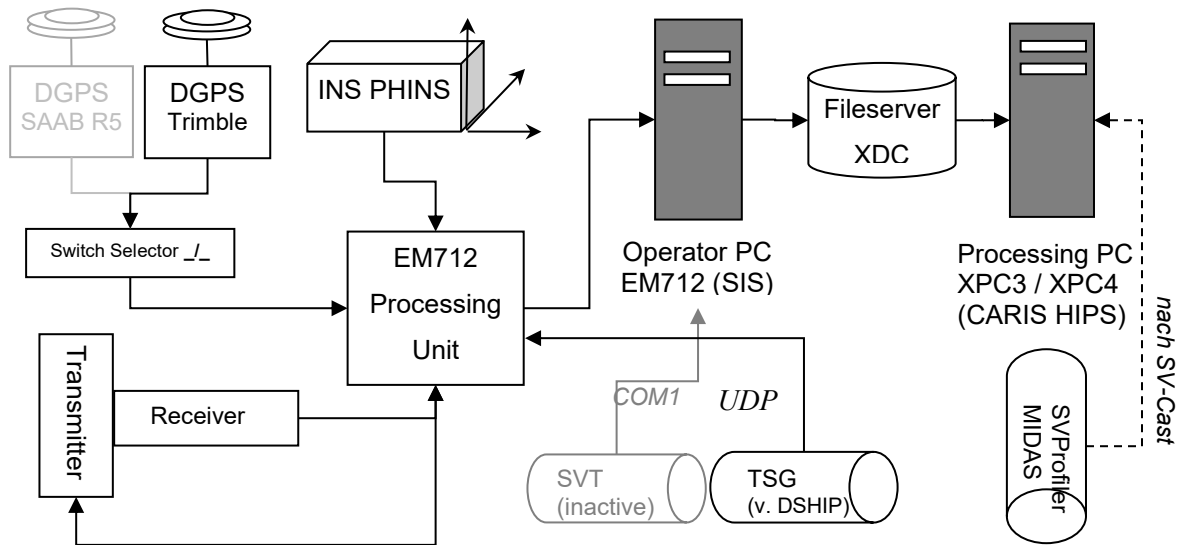


Figure 1: Sensor dependencies

2.3 Sensor layout / alignment

The sensor layout and alignment has been measured by the survey company Overath & Sand Ship Surveyors. The Inertial Navigation System (INS) is located in the coordinate origin. All offsets of the transmitting transducer (TX), the receiving transducer (RX) and the GPS-Antennas refer to the INS position:

Position system 1	Trimble	Serial port 1	GGA	ACTIVE-OK
Name:	Trimble			
	Forward, X	Starboard, Y	Downward, Z	
Location offset (XYZ)	- 13.649 +	- 2.976 +	- -11.406 +	

Figure 2: Location offsets GPS Antenna



TX 1

Forward, X / Roll

TX transducer (view from aft)

Starboard, Y / Pitch

TX transducer (view from port)

Downward, Z / Heading

TX transducer (view from mast)

TX 1 Location offset (XYZ)

-

17.709

+

-

1.037

+

-

4.961

+

TX 1 Angular offset (Roll/Pitch/Heading)

-

0.2

+

-

0.04

+

-

0

+

TX1 Rotated 180 deg

RX 1

Forward, X / Roll

RX transducer (view from aft)

Starboard, Y / Pitch

RX transducer (view from port)

Downward, Z / Heading

RX transducer (view from mast)

RX 1 Location offset (XYZ)

-

16.987

+

-

1.156

+

-

4.963

+

RX 1 Angular offset (Roll/Pitch/Heading)

-

0.2

+

-

0.04

+

-

0

+

RX1 Rotated 180 deg

RX 1 BS offset

-

0

+

Misc

Water line vertical location

-

1.18

+

Figure 3: Location offsets Transducer TX & RX

The angular misalignment of the transducer and transmitters with respect to the INS:



-	Attitude system 1	PHINS	Net port 1	KM Binary					
Name:	PHINS								
	Forward, X / Roll		Starboard, Y / Pitch	Downward, Z / Heading					
Location offset (XYZ)	-	0	+	-	0	+	-	0	+
Angular offset (RPH)	-	0	+	-	0	+	-	0	+
Attitude delay (s)	-	0	+						
Roll reference plane	Rotation								
Format	KM Binary								
Input	Net port 1								
Ethernet adapter:	Second net								
Port:	-	27000	+						

Figure 4: Angular offsets

+	Position system 1	Trimble	Serial port 1	GGA	ACTIVE-OK
+	Position system 2	Position system name	No	GGA	OFF
+	Position system 3	Position system name	No	GGA	OFF
+	Attitude system 1	Attitude system name	Serial port 2	EM Attitude	OK
+	Attitude system 2	Attitude system name	Net port 1	KM Binary	ACTIVE-OK
+	Depth/pressure	Depth system name			OFF
+	Sound velocity probe	Valeport Mini SVS	Net port 2	AML SVT	MISSING
+	Time system	Clock name	Serial port 1	ZDA	OK OK
Set active systems					
Active position system		Position system 1			
Active attitude system		Attitude system 2			

Figure 5: Sensor Setup Settings



If the sound velocity probe shows “MISSING” values (Figure 5: Sensor Setup Settings) it means that the water pump at the TSG system is switched off (usual in harbor areas due to dirty water). The crew will switch it on in clean waters. In doubt please ask the bridge personal.

3 SIS – Kongsbergs Acquisition Software

Figure 6 shows the normal sequence of operations required for survey runs using SIS.

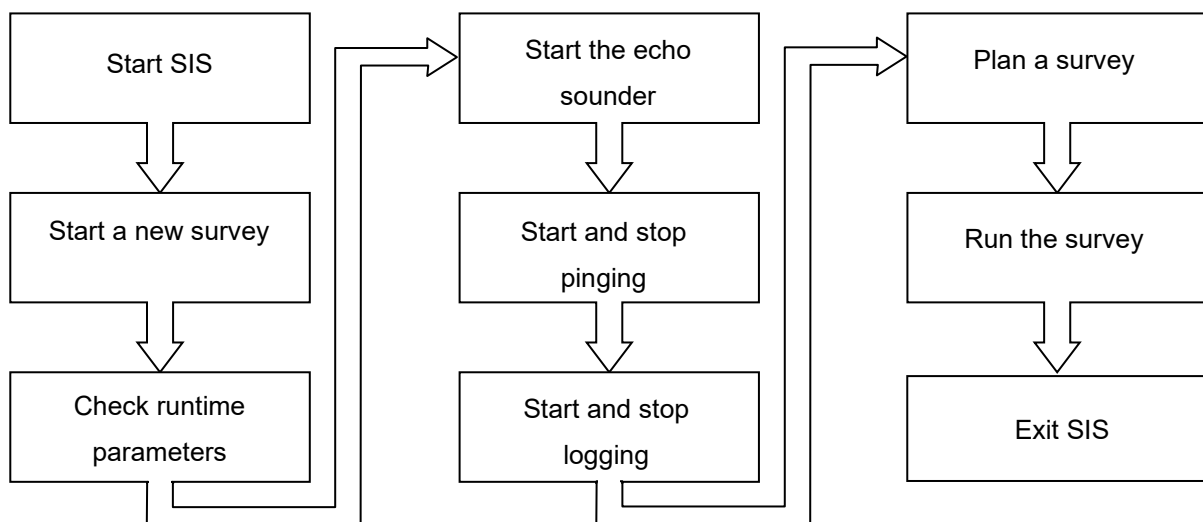
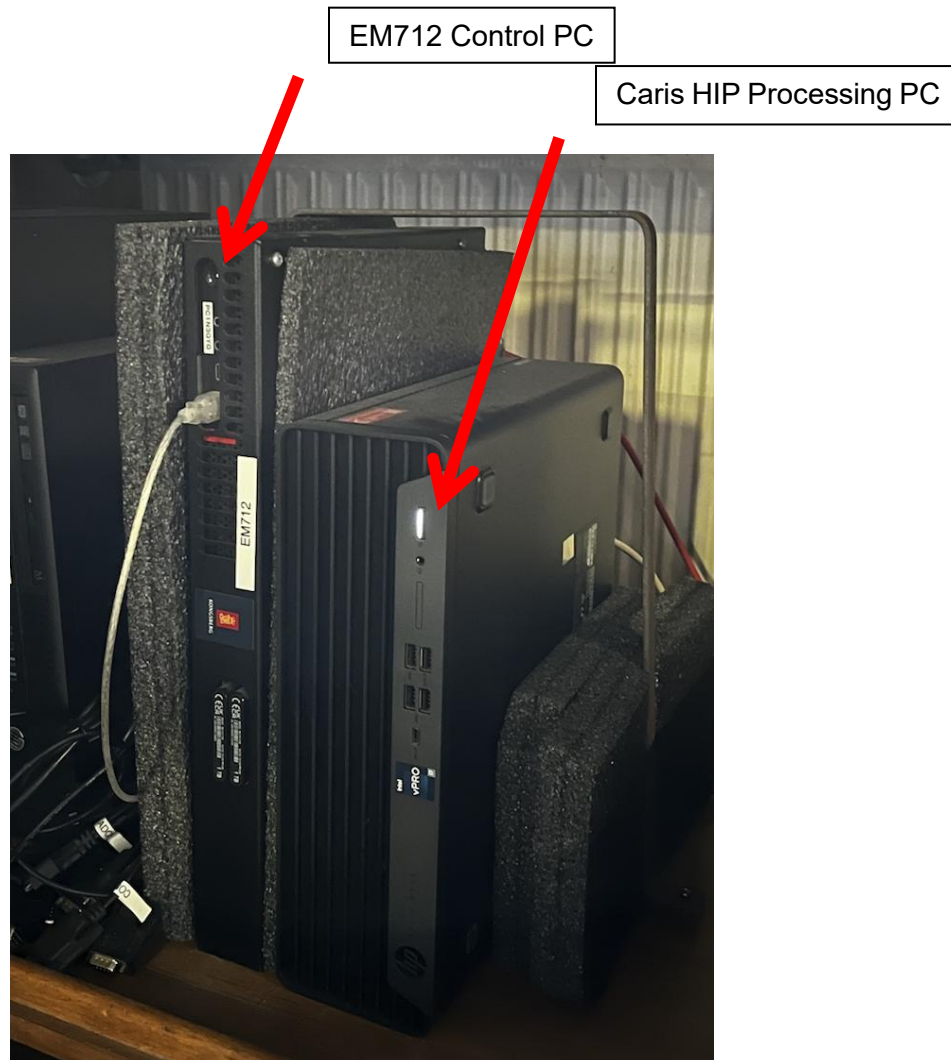


Figure 6: Workflow diagram for survey runs with SIS

3.1 Start SIS (SIS Operator Manual - page 94)

- Power up the echo sounder unit (**by captain**)
- Power up the SIS Operator Station



- It is not necessary to insert a dongle.
- Login

(username and password please ask the captain)

- Wait for at least **1 minute** before you start SIS, otherwise it may happen that SIS can not read the licence and that the transducer is not being found.
- Click on the SIS icon on the desktop or select SIS from the Windows start menu

3.2 Start a new survey

To create a new survey project at the beginning of a new expedition open the **New survey** frame (Figure 7).

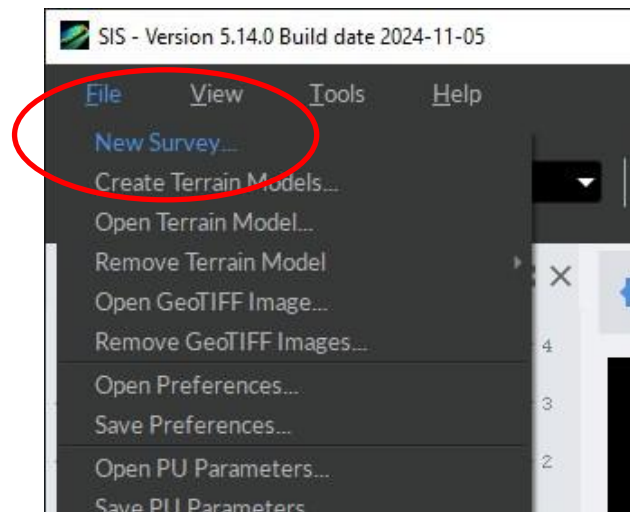


Figure 7: Open the New Survey Window

Important **New Survey** parameters to set are:

- **New survey name:** Enter a unique new survey name descriptive to the survey (Figure 8).

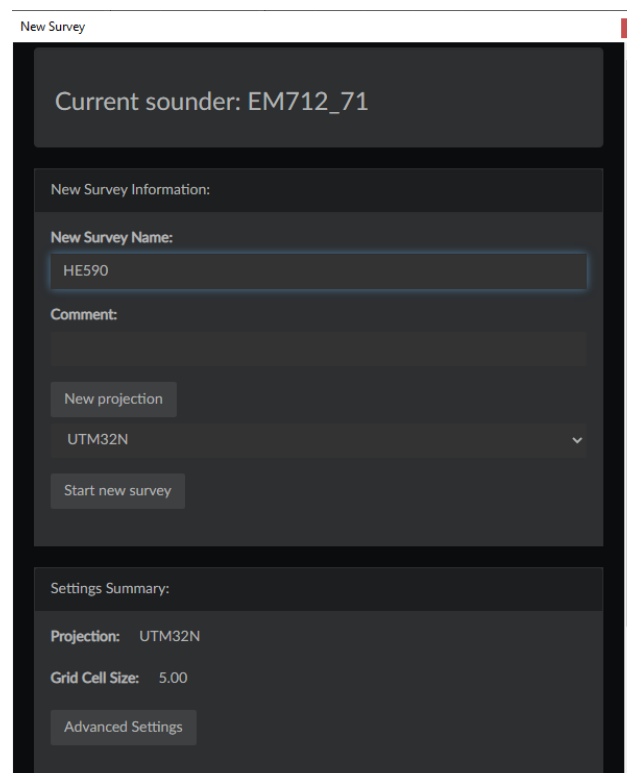


Figure 8: Basic parameters display



- **New projection:** Select map projection. It should be either **UTM31N_WGS84** or **UTM32N_WGS84** depending on the working area (Figure 9).

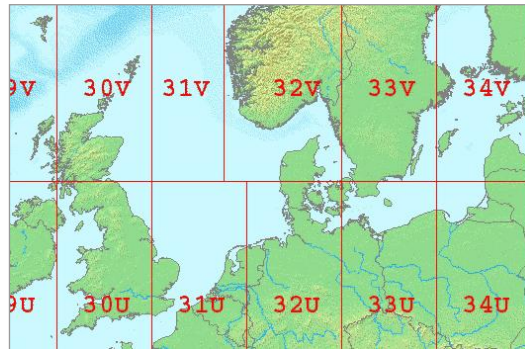


Figure 9: UTM cells in the North Sea

When finished, press **OK**.

Using background data

To display background data such as coastlines, the data needs to be imported into the SIS geographical view.

- First open the import/export window. (**File -> Import GeoTIFF Image...**)
- Select Image and press **Ok** again to finish importing the background data. The image is now displayed in the SIS **geographical view**.

To remove background data from SIS go back into the **Unload GeoTiff Images window** select the item you wish to remove from Background Images.

A background image file containing the European coastlines can be found on the SIS-Operator PC.

3.3 Check runtime parameters

(Referring SIS Operator Manual - page 103)

The runtime parameters are associated with the echo sounder and not with the survey (Figure 10).

Important Runtime parameters to set are:



- **Maximum angle:** Select **Sounder Main**. Under **Sector Coverage/ Max. Angle** the maximum swath width can be defined by setting the maximum port and starboard angles. The maximum angle possible is 70°. Recommend is an angle between 45° and 55° depending on the sea state.
- **Depth settings:** Select **Sounder Main**. Make sure that the **Minimum Depth** and **Maximum Depth** settings are appropriate limits for the survey area or at least for the current location where the survey is planned to start. If the real depth is beyond these limits, the echosounder will not find the seafloor!
- **Ping Mode:** Select **Sounder Main**. Under **Depth settings/Ping Mode** the operational mode of the EM712_71 is defined. The Ping Mode should be set to **AUTO**.
- **Select SVP profile:** Select **Sound Speed**. The sound speed profile parameter allows to select the sound speed profile to be used in the echo sounder's depth calculations (See also Chapter 4.2).

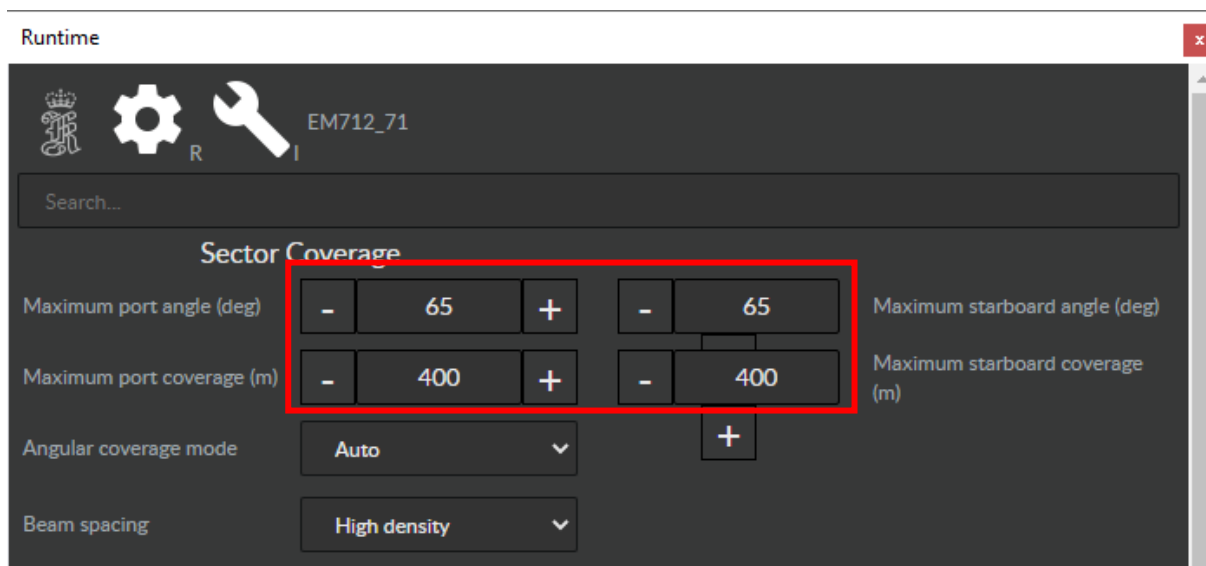


Figure 10: Runtime parameters display

3.4 Start the echo sounder

(Referring SIS Operator Manual - page 126)

Before starting pinging, the echo sounder must be turned on. Select the echo sounder from the **Echo sounder - not started** combo box (Figure 11). The **Logging** and **Pinging** buttons



will all be disabled until the echo sounder is ready. When the echo sounder is ready, pinging can be started.

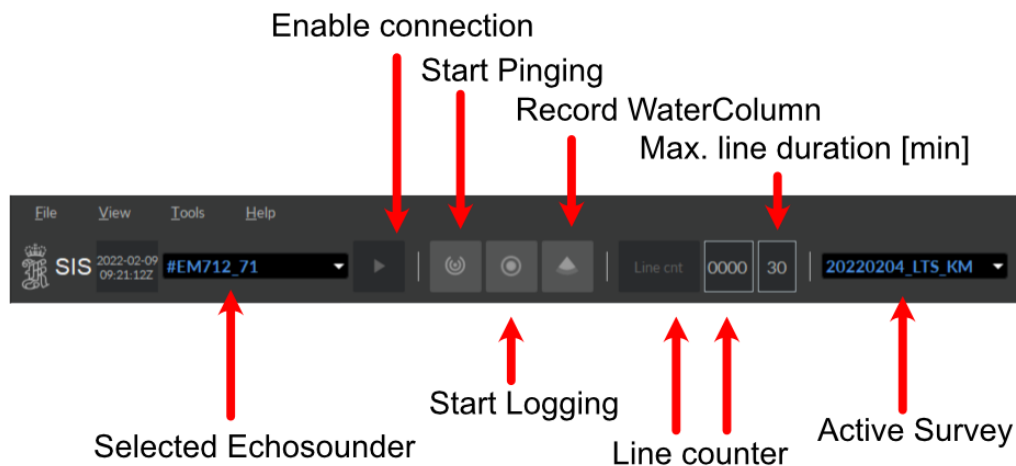


Figure 11: The main frame

3.5 Start and stop pinging

(Referring SIS Operator Manual - page 46)

Pinging must be started manually after the echo sounder is ready. Press the **Pinging** button on the toolbar. The button is red when **Off** and green when **On** (Figure 11).

3.6 Start and stop logging

(Referring SIS Operator Manual - page 46 and following)

Logging must be started manually after the echo sounder is ready. When the echo sounder has started logging, data is automatically saved to disk in *.kml file format (Figure 11).

Note that if pinging is **Off** when logging is turned **On**, pinging will automatically be turned **On**. If logging is **On** and pinging is turned **Off**, logging will automatically be turned **Off**.

For logging the water column data press the **WCL** button on the toolbar it will turn from grey to red if logging is enabled and will turn green during logging (Figure 11). This data will be written to *.wcd files in your selected folder, separately from the *.all files.

Warning: Water column data will be much larger than the default multibeam data (1 to 2 GB per hour extra). Please make sure to move these files regularly from the acquisition PC.



3.7 Plan a new job

The planning module allows creating survey lines in the area to be surveyed. With this tool survey lines can be created which the vessel must sail. Please refer to the SIS Operator Manual - page 20.

3.8 Run the survey

On board of RV "Heincke" the raw multibeam data will be stored under **E:\sisdata\raw\...*kmal**.

Load Job:

- Open the **Planning module** frame
- Expand **Jobs**
- Press the **Open job** button
- Select the file where the planned survey lines are stored
- Expand **Remote**
- Press **Transfer plan** so send the planned lines and objects to the remote helmsman display

During the survey:

- Observe the **Geographical window** which gives an overall control of the performance of SIS and the multibeam echo sounder.
- Observe logging, pinging and line number status on the right hand side of the toolbar.
- Observe the **Numerical display**, where the sensor data values can be monitored.
- Observe the three status lamps on the main toolbar which give status of hardware units (applies to multibeam echo sounders only) (Figure 11).
- Observe the **Cross track** display. The **cross track** window shows the measured depths in all beams from the last ping. If it forms a smiley or a frown the sound velocity profile is not suitable anymore and as a result wrong depths are calculated.



3.9 Interferences and External Triggering

Echosounders may interfere with other hydroacoustic systems such as other echosounders, ADCPs, Doppler velocity log of the vessel, etc. and also with general ship's noise like engines, propellers or sea water pumps. Especially echosounders operating at the same or the multiple of the EM712 transmission/reception frequencies (70 to 100 kHz) are potential interferers. If you receive a lot of erroneous data from the EM712 especially in the inner beam section and in continuous intervals you should consider switching off other instruments. On RV Heincke the following instruments could or do interfere with the EM712:

- Navigation sounder (Navlot) at 50 kHz
- Scientific fishery echosounder EK80 at 38, 70, 120 and/or 200kHz
- ADCP 150 kHz and ADCP 600 kHz
- Underwater Positioning System GAPS at 22 to 30 kHz
- Sediment echosounder SES2000 at 100 kHz and 5-15 kHz

To avoid sounding interferences with the Sub Bottom Profiler SES2000 it is possible to synchronize the pinging between SES2000 and EM712 by use of an external trigger (Figure 12). The trigger system (Updated Febr. 2022) uses the EM712 as the main trigger and informs the SES2000 when it is possible to trigger.

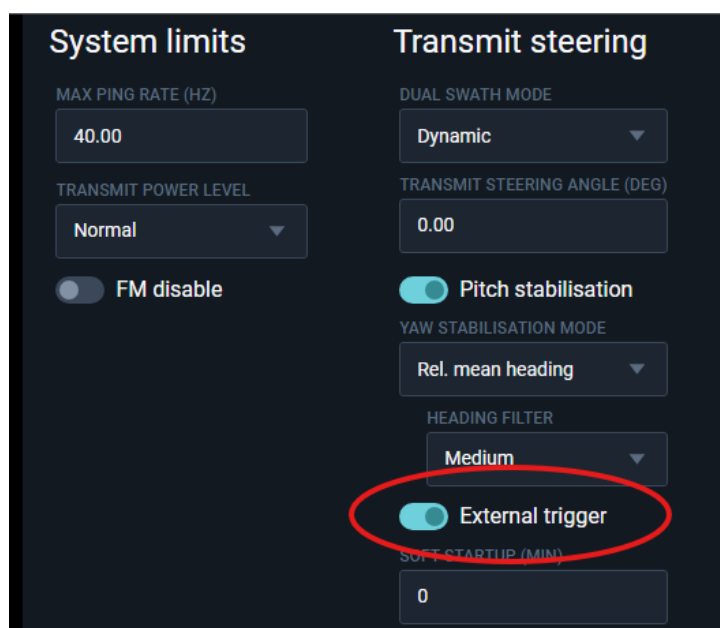


Figure 12 - External Trigger enabling/disabling in SIS



3.10 Remote Control / Watch using VNC

To remote control or watch the EM712 operator PC the software VNC is installed on the operator PC as a service. The operator PC's host name is EM712, ip address is 192.168.150.55. The password can be set in the settings menu of VNC (right click on icon below, Admin Settings):



Using VNC client software you may connect to this PC. It is installed on the EK60-PC at the bridge officer's starboard panel and at the XPC3 in dry lab.

4 Sound velocity measurements

On board of RV "Heincke" sound velocity profiles can be measured using the Valeport MIDAS SVP probe, which is stored in the dry lab.

We strongly recommend measuring a sound velocity profile before starting a new survey. Depending on the survey area, duration and purpose this should be repeated regularly.



4.1 Operate Valeport MIDAS SVP

The Valeport program **Data Log Express** is installed on the computer **xpc3** in the dry lab (**username: mbesadmin, password: please ask the captain**).

Preparation of the probe in the lab:

- Connect the SV probe with the computer (xpc3) on the serial COM port



- Start **Data Log Express**
- Connect to the probe
- Check the settings
- Select **OFFLINE** acquisition mode
- Start the acquisition with **RUN**
- Remove the serial cable and put on the dummy plug

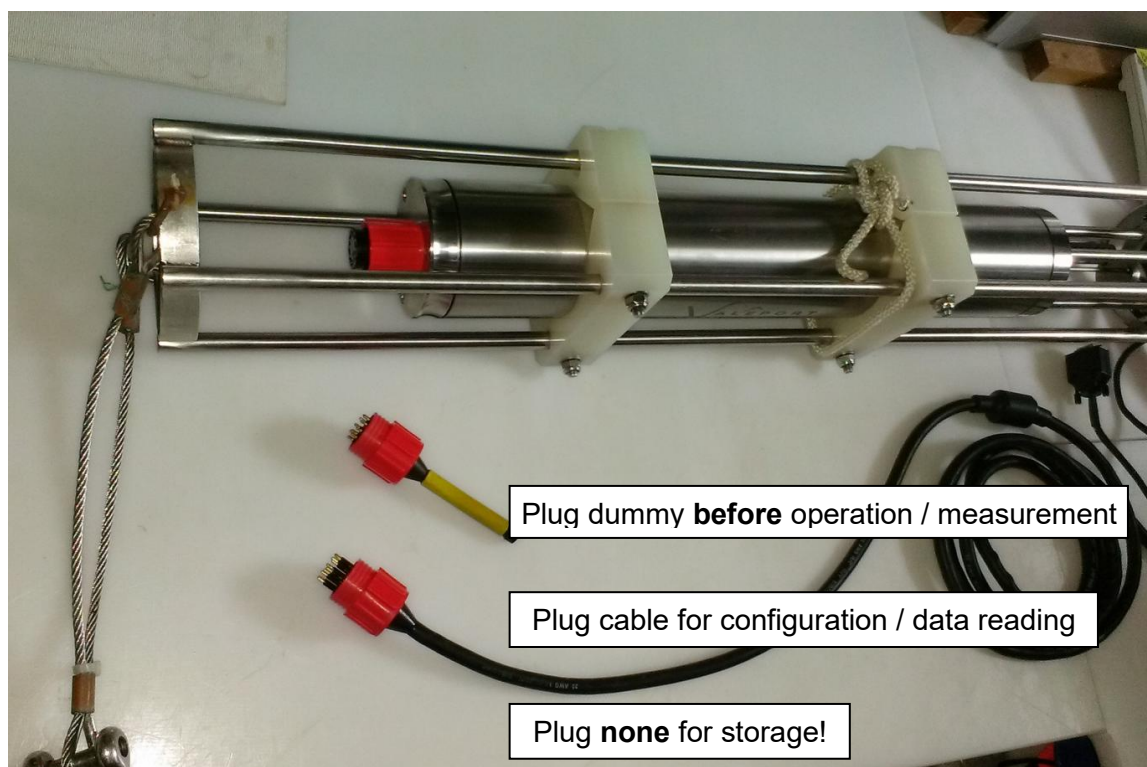
!!!! With the dummy plug on the probe is online and uses up the batteries !!!!

Measurement in the water:

- Lower the SV probe to the desired depth
- Heave it back on deck
- Rinse the probe with clear water and dry the probe

Data export:

- Dry the connectors and remove the dummy plug
- Connect the serial cable again to the computer's serial COM port
- Start **Data Log Express and continue like described in the separate manual.**
- **Export the Kongsberg file (asvp).** This file can be imported to the SVP Editor in SIS (see next chapter)
- Disconnect the SV Probe from the PC and secure safely in the case. **DO NOT PUT ON THE DUMMY PLUG.**



4.2 SVP editor

By using the SVP editor the *.asvp format can be read by SIS.

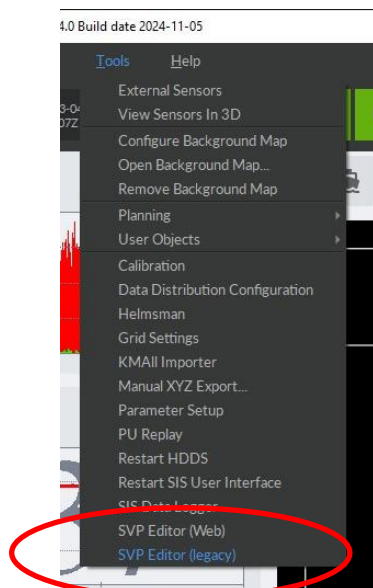


Figure 13 - Import SVP



Open the SVP file (**File/Open in editor**):

- Browse for the SVP input file and press **Open**. The **Raw file editor** opens
- Select the delimiter from the drop-down list. Choose "<tab>". (Figure 14)

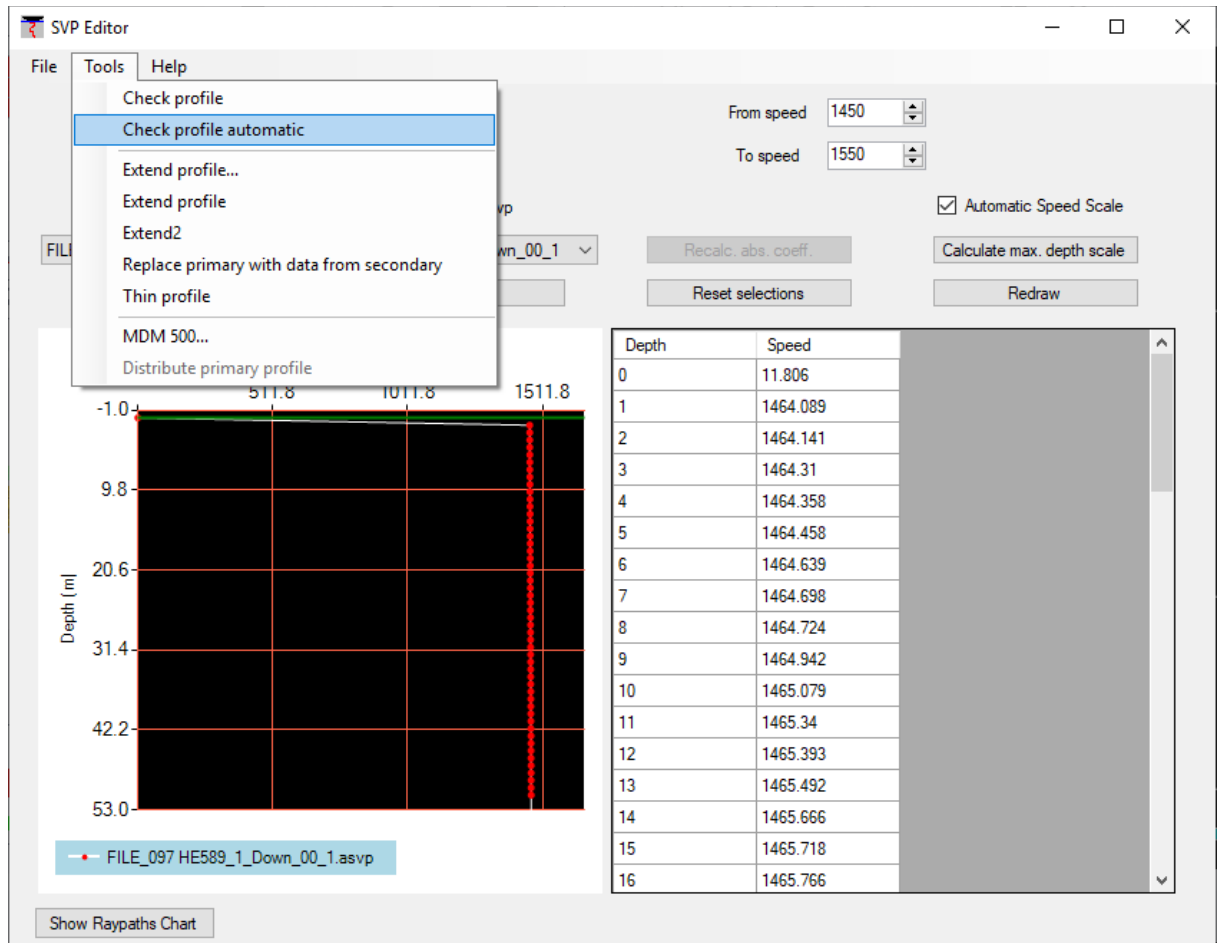


Figure 14: Check profile

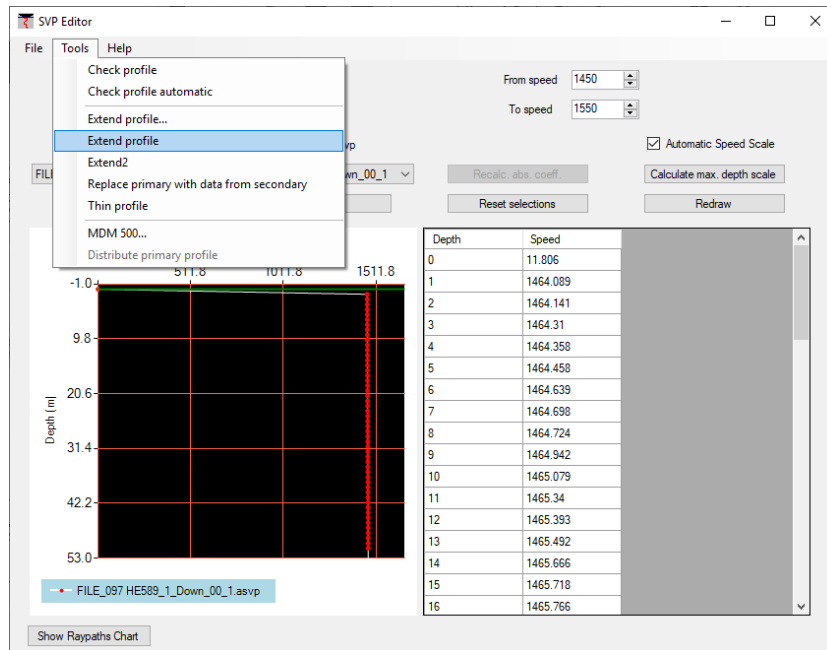


Figure 15: Extend profile

- Press “Extend profile” in the Menu to extend the SVP to 12000 m depth, which is necessary for SIS.

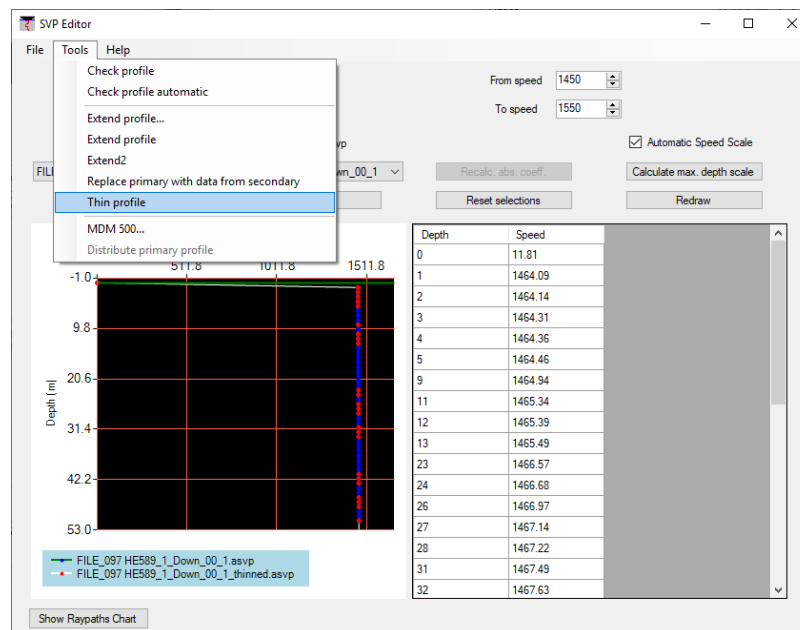
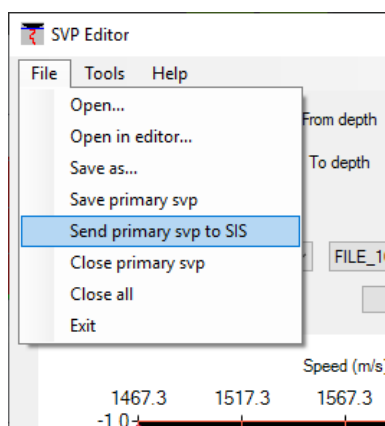


Figure 16: Thin profile



- A window opens for a thinning factor. Chosse 0.1 and press OK. The thin profile results will be displayed.
- The SVP will then be automatically directed and saved by SIS, by clicking on “Send primary svp to SIS.”



Furthermore, it is highly recommended to use “Probe” in the settings in SIS to be used at the “Sound velocity source” (Figure 17) which can be configured at “Runtime Parameters”.

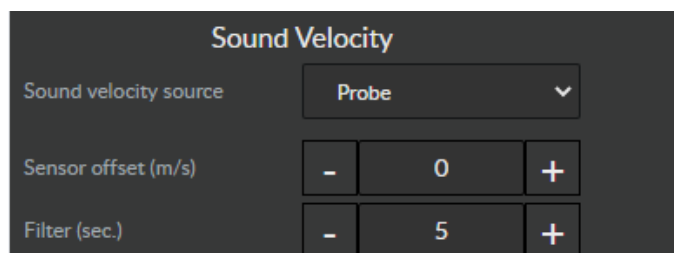


Figure 17: Select sound speed at source

5 Post Processing in CARIS HIPS

The processing software Caris HIPS is installed on the computer **bridge-07** (**username: scientist**) which is placed next to the SIS EM712 computer. For the **dongle** and the **password** please ask the captain.

Before processing the data, copy the raw data from the SIS Operator station to the Data Processing Station via the network share server **xdc01** to the folder D:\HIPS\Raw-Data\HE*ExpeditionNumber*



Caris 12 is launched by clicking on the icon on the desktop:



5.1 Create a new HIPS project

When opening HIPS, a window will show up, where the user can import new data (Figure 18, left image). Otherwise, the icon in the menu bar can be used to call the data importer application (Figure 18, right image).

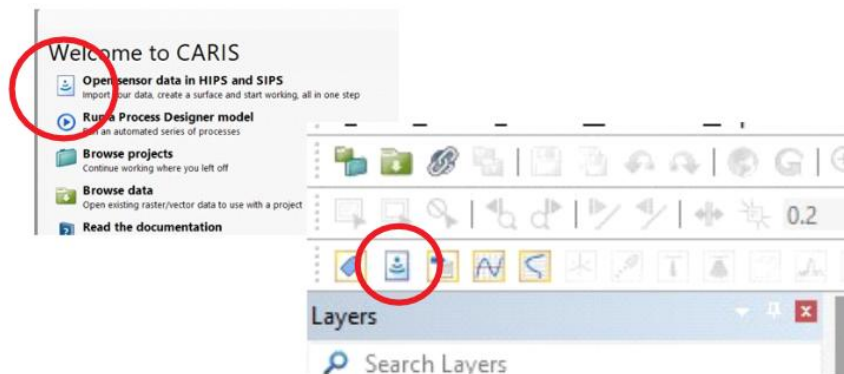


Figure 18 - Import data

Select Kongsberg KMALL for the file type and the raw files you want to import and check if the checkbox “Convert Navigation to HDCS ...” is enabled (1.) and load KMALL files (2). Please create a new folder at D:\HIPS\HIPS-Data\ to keep the data structure clean (3.). You can create a new vessel file based on the raw data, or open the Vessel file which is located at D:\HIPS\VesselFile\FS-Heincke.vessel (4.)

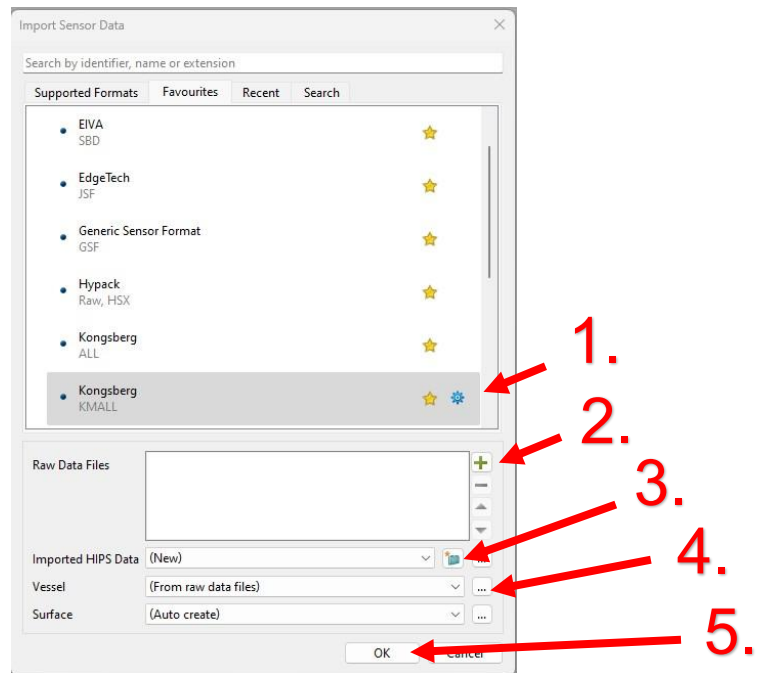


Figure 19 - Import Options

When clicking OK, the data will be imported and a new surface will be created automatically. Now you can start to edit the data in the swath editor (Figure 20, Figure 21).

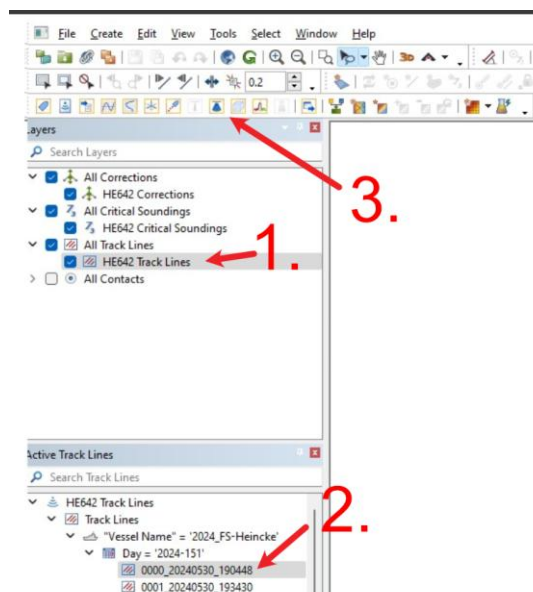


Figure 20 - Open Swath editor

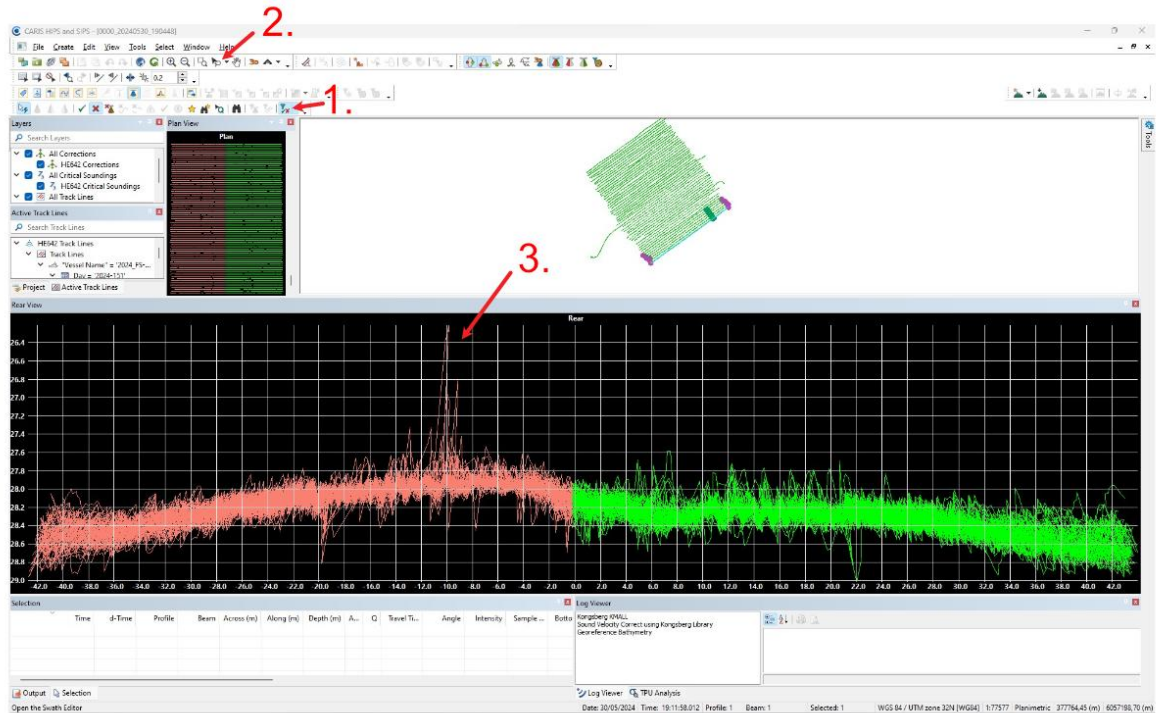


Figure 21 - Use Swath Editor

In the swath editor, choose rejecting (1.), lasso tool (2.) and circle the pings (3.) you want to remove (Figure 21).

5.2 Subset editor

You can use the subset editor to have a detailed view of data of multiple files. Click on the Subset editor icon (Figure 22) and select a regional extend in the main grid view (Figure 23, 1.). Similar to the swath editor you can remove data in the 2D subset editor (Figure 23, 3) or by applying filter (Figure 23, 2).

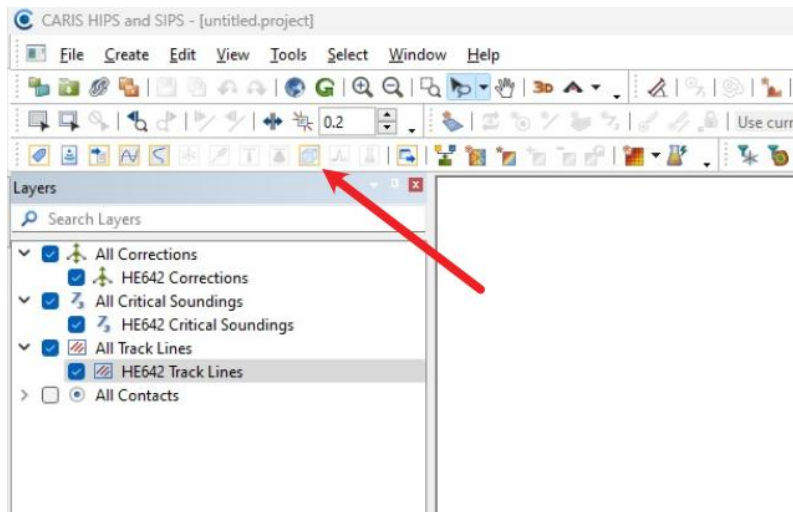


Figure 22 - Open Subset Editor

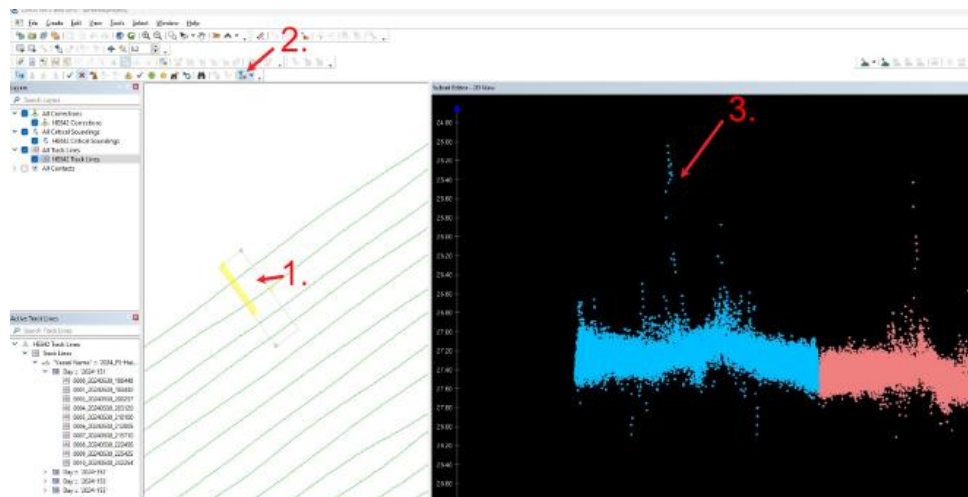


Figure 23 - Use Subset Editor

5.3 Georeference Bathymetry/Merge & GPS tide data

The georeferencing tool is used for applying tide and SVP data, former known as merge tool (Figure 24). Applying tide data is optional, but if you want to add tide data, you have to add sound velocity data recorded with the AML probe or CTD as well (Figure 25, 3.).

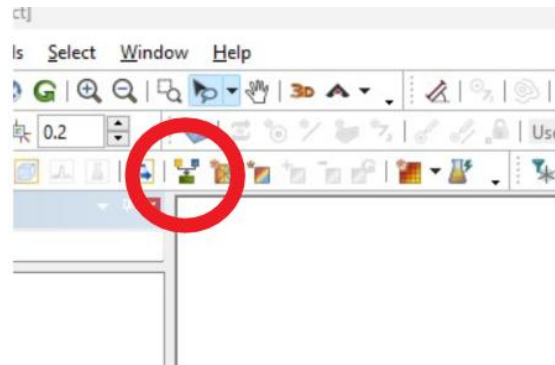


Figure 24 - Open Georef/Merge Tool

GPS tide data is automatically generated on FS Heincke on a separate server, which post processes the GPS data. The data is stored at the network drive under Underway\gpstide\processing\. The subfolders represent the gps-week and the day of the week. The final data is processed after 2-3 days due to GPS correction methods. The gps tide data can be selected at tidal observations (Figure 25, 4.), when applying “Vertical datum reference” with the tide option (Figure 25, 2.). The *_fitted.tid file is the usual file to use.

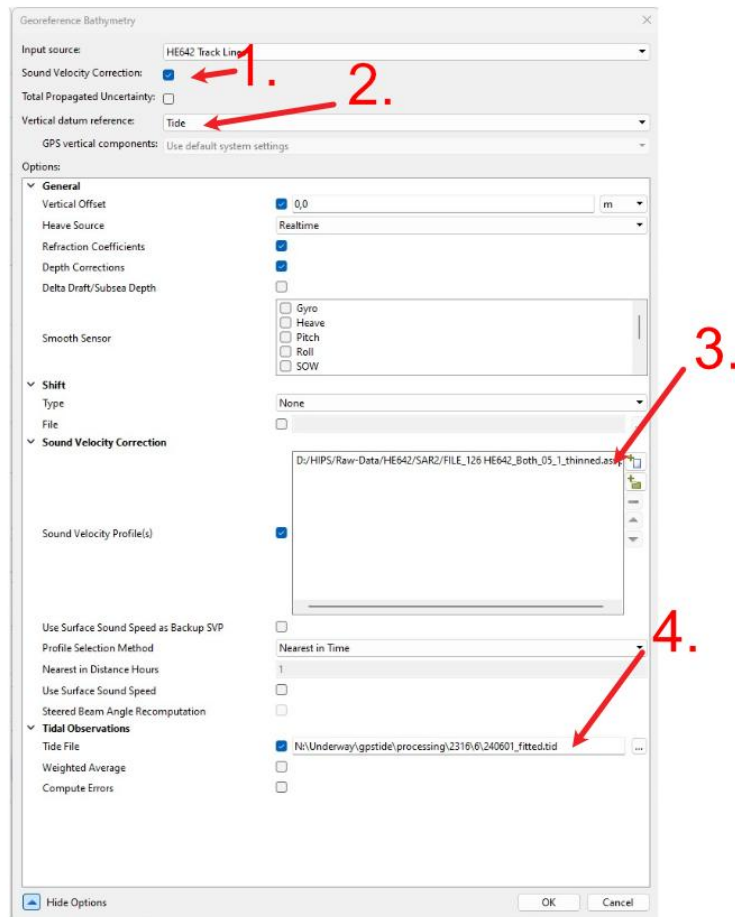


Figure 25 – Options

When the processed is finished, the user has to recompute the field sheet. This will be indicated by a red exclamation mark in the icon next to the selected raster. Right click on the surface icon and press “Recompute” (Figure 26).

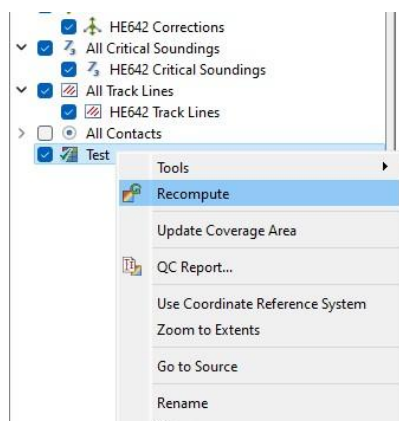


Figure 26 - Recompute Surface



5.4 Create new bathymetry surface

The user can create multiple surfaces by clicking on the “New Regular Gridded Surface” button (Figure 27).



Figure 27 - Create new surface

Select Swath Angle in the settings (1.) and a user defined area (2.). Store the surface at a location of your HIPS project (3.).

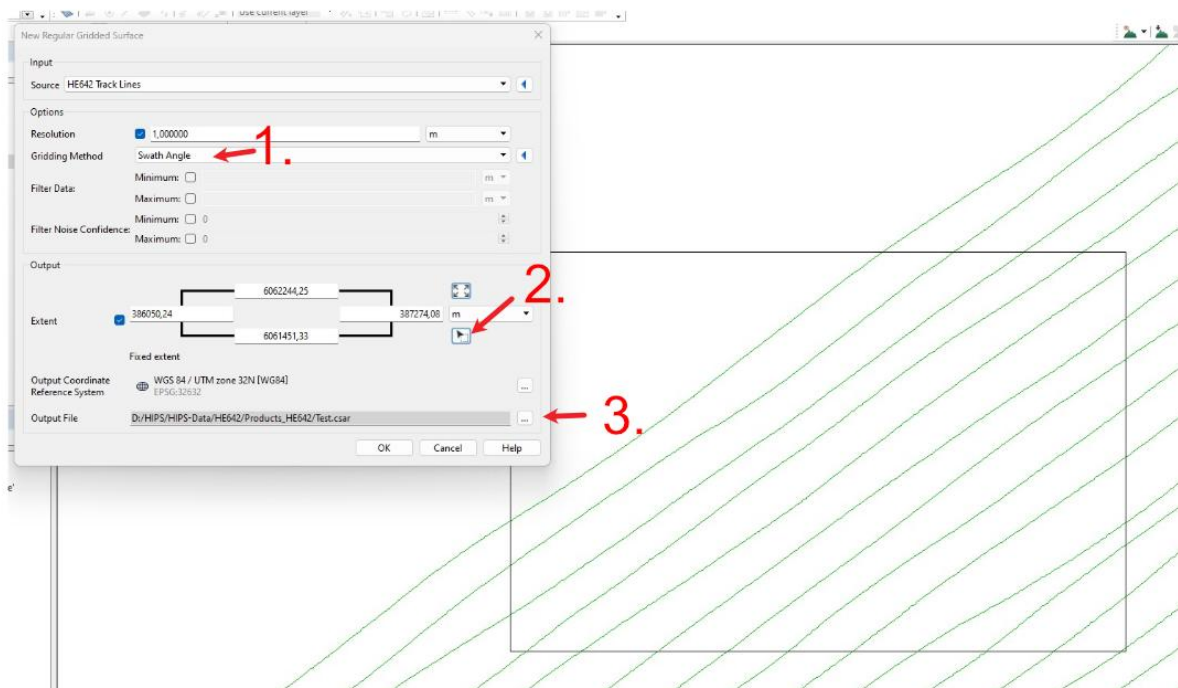


Figure 28 - Create new surface options



5.5 Export data



Figure 29 - Export Data

To export the surface data, go to **File/Export** (Figure 29). All possible export options are listed. Usual export formats are Geotiff and ASCII output.

6 Tips and tricks

6.1 Planning survey lines in SIS

A survey is normally planned taking the following into account:

- Echo sounder coverage
- Seafloor topography
- Sound speed variations
- Weather conditions

Please note, that all drawing and selecting commands are performed by pressing CTRL & left mouse button. To end all kind of drawings, the changes must be confirmed by clicking CTRL & right mouse button and accept.



To create a new job click **New Job**, enter a descriptive name of the job and select the preferred coordinate format. Then a new line or polygon can be created – depending on the survey plan - by activating the corresponding button (**New Line/New Polygon**). The respective mode is active until another option is selected or the button is pressed once more. Create a new line or polygon by holding the CTRL key while clicking the left mouse button for each new point of the line or for each node in the polygon respectively. At the end click CTRL and the right mouse button to accept the operation. Lines/Polygons can be edited using **Edit selected**. Note that the object has to be selected first. Now it is possible to insert for example the exact coordinates of the line/polygon.

Fill Polygon

A polygon can be filled with lines with specific line spacing. Therefore a new line just outside but near the polygon has to be created. The length of the line should be related to the maximum extent of the polygon in this orientation. For filling the polygon select both the polygon and the line and press **Fill Polygon**. Now the distance and spacing between the parallel lines can be defined (both port and starboard directions). How to determine the line spacing is explained in the following chapter. Every line has a defined direction, marked with a square at the start of the line. To reflect the sailing, select every second line and press **Reverse Line**. When finished save the job (**Save Job**). The coordinates of the start- and endpoints of the new survey lines will be saved as a ASCII file under E:\sisdata\common\planning.

6.2 Line spacing

To determine the line spacing the achievable coverage of the multibeam echo sounder and the overlap required between neighbouring lines is required. The echo sounder coverage depends on the opening angle (α) of the multibeam and the water depth (h) (Figure 30).

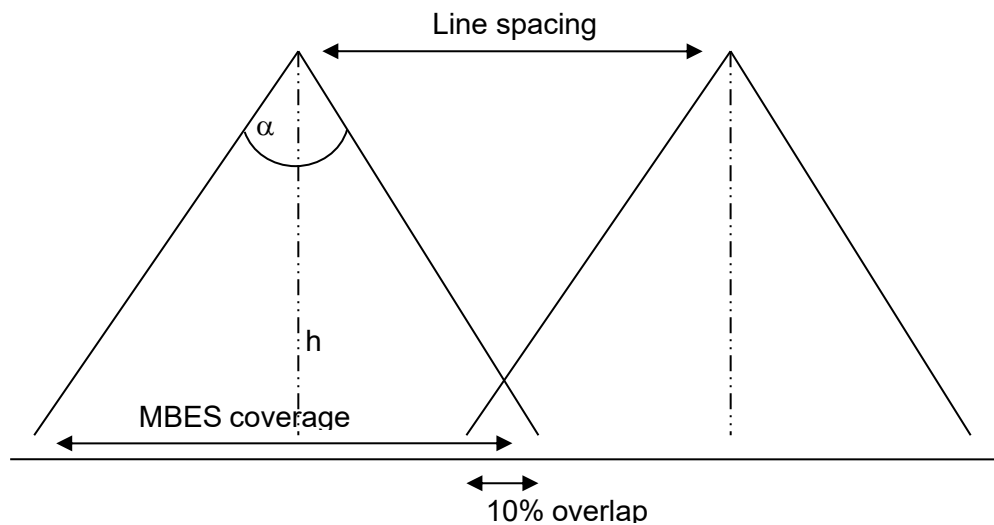


Figure 30: Important parameters for determining the line spacing

For a full coverage survey, including 10 % overlap, the line spacing can be calculated as follows:

α	$= 55^\circ$	
h	$= 30 \text{ m}$	
MBES coverage	$= \tan(55) \cdot 30 \cdot 2$	$= 85.7 \text{ m}$
Overlap (10%)	$= 0.1 \cdot (\tan(55) \cdot 30)$	$= 4.3 \text{ m}$
Line spacing:	$= \text{MBES coverage} - \text{Overlap} = 85.7 \text{ m} - 4.3 \text{ m} = 81.4 \text{ m}$	

The vessel speed depends on the desired resolution and on the weather condition while acquiring the data. Typically a speed of 6 knots is appropriate.



7 Appendix

7.1 Latest Service and Calibration Report (10.-11.02.2026)

German only!

7.1.1 Übersicht

Die Reise HE675 der FS „Heincke“ wurde unter anderem als Erprobungsfahrt für durch Fa. FIELAX betreute Systeme genutzt. Die durchgeführten Arbeiten und Ergebnisse werden in diesem Bericht zusammengefasst.

Teilnehmer: FIELAX – Nehring, Heckel, Tardeck, Stockfisch; AWI – Krockner, Eilers

Zeitraum: 10.- 11.02.2026

Ziel: Nordsee, Region Helgoland

Wetter: sonnig, klar, Luft $2.0 \pm 0.5^{\circ}\text{C}$, Wasser $2.5 \pm 1.0^{\circ}\text{C}$, Wind Ø 10m/s E

7.1.2 Fächerlot Kongsberg EM712

Generelle Arbeiten:

- ✓ Testbetrieb und Datenaufzeichnung mit SIS
- ✓ Datenauswertung und –begutachtung mit Caris HIPS
- ✓ Aufräumen des Operator-PCs
- ✓ Update der SIS Software auf Version 5.15.1 und Firmware-Update
- ✓ Update der Caris HIPS Version und Lizenz
- ✓ Aktualisierung des FIELAX Startup Manuals auf v2.3

Fächerlot-Kalibrierung

Die Kalibrierung wurden mit Caris HIPS Version 12.2 durchgeführt, welches vor der Probefahrt aktualisiert wurde. Die Kalibrierung wurde über dem Wrack der Hela umgesetzt, da diese für die Pitch- und Heading-Kalibrierung gut geeignet ist. Die Rollkalibrierung wurde über dem flachen Meeresgrund durchgeführt. Die Kalibrierwerte vom letzten Jahr wurden bestätigt und sind unverändert.



	Roll	Pitch	Yaw
PHINS	0	0	0
RX/TX	0.2	0.04	0

Abbildung 1: Ergebnisse der Fächerlot-Kalibrierung 2026

Kalibrierprofildurchführung:

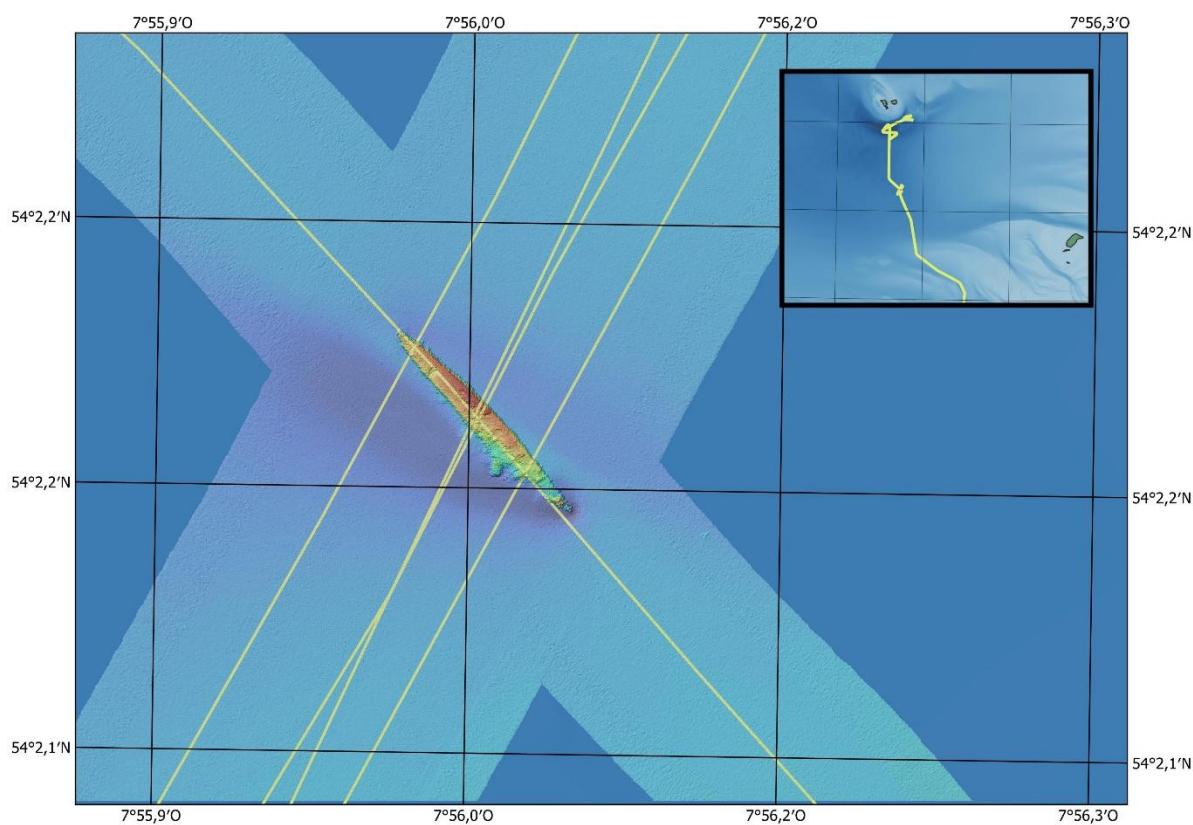


Abbildung 2: Übersichtskarte der Kalibrierungsprofile für das EM712 südlich von Helgoland über dem Wrack HELA