System and Transducer Handling

➤ Use the delivered transport boxes for any transport and storage of the equipment.
➤ Ensure proper cooling of the system unit, do not block the airflow.
➤ Avoid any mechanical stress of the transducer surface and the cable.
➤ The transducer surface must not be applied to direct UV (sun) light.
➤ Do not plug/unplug the transducer if the system is powered.
➤ The transducer must be operated in water only; operating in air may destroy it.
➤ Before storage the transducer should be cleaned using fresh water to avoid corrosion.

How to get good data quality

In advance of any data collection the main question should be *"What do I want to achieve?"* because different applications require different software settings. Most emphasis should be put on the hardware installation and on system settings that cannot be altered during post processing: frequency, signal length (pulses), range and gain.

HARDWARE INSTALLATION / SETUP
Make sure the transducer is mounted properly to avoid too much noise picked up from the engine or vibrations of the transducer's pole.
Use an extra ground wire from the transducer to the topside unit to avoid electrical noise.
Ensure airflow around the system for cooling and do not block the slits and fans in the housing.
Set up and check GPS and motion sensor properly to ensure reliable data.
Do not plug / unplug the transducer if the system is powered!

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FREQUENCY
For most applications 10kHz and above should be used. If penetration is the main goal then a good starting point would be 8kHz or 6kHz (depending on the noise level).
If resolution is the main goal then a good starting point would be a frequency of 12kHz.

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PULSES
If resolution is the main goal then a good starting point would be 1 or 2 pulses.
If there is a high noise level or the survey is in deeper waters the pulse length (number of pulses) should be increased.

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RANGE
In general the range length should be set as small as possible. This will give the best resolution, especially on systems without raw data storage. A good starting point is a range start a few meters above seabed and a range length of not more than 20 meters, unless good penetration is achieved and the goal is to see sediment layers in deeper parts of the sub-seabed.

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GAIN
The rule of thumb is to set the gain for each frequency (HF/LF) in a way that the signal is not over-amplified but uses almost the whole dynamic range.
The signal window should be observed and the gain should be increased from 0dB until the signal peaks hit the top of the window occasionally.
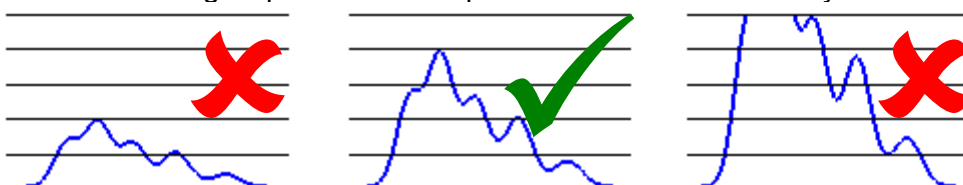
Checklist for System Setup / Survey Start

Transducer Installation

○ Transducer is mounted in stiff frame or supporting structure.
○ Transducer is decoupled acoustically from the ship's hull by elastic material (rubber).
○ Transducer's active area is horizontal.
○ Transducer is located as far away from noise sources as possible.
○ Transducer is covered by water at all times, even at rough sea conditions.
○ An additional ground wire is going from the transducer's housing to the topside unit.
○ The draught of the transducer (distance from water surface to bottom of transducer) is measured and noted.

Topside Unit Installation

○ Topside unit is placed in a dry environment.
○ Cooling slits (bottom, front and rear panel) are free and there is space for airflow.
○ Main power supply is checked. If a generator is used, a ground wire should be connected to the generator going to the SES topside unit.
○ Power cable is plugged in.
○ Transducer cable is plugged in. Do only plug/unplug if the system is turned off!
○ Additional ground wire from the transducer connected to the topside unit.
○ Additional sensors (Motion sensor / GPS) are connected to the specified serial ports. (Since sometimes the Windows OS is confused if the sensors are connected while booting, this step can be postponed)
○ Check if all connectors are fastened properly and all cables are fixed.

System power-up

○ Make sure the transducer is below water level and covered by water all times.
○ Switch on main power → power switch and all power LEDs are lit green.
○ Switch on the control computer and boot the Windows OS.
○ Now it's safe to connect additional sensors, if postponed (see above).
○ Start the SESWIN software.
○ The SBP echo print part of the SESWIN window starts scrolling from right to left. If not, check the synchronisation mode ("System Setup – Settings – General").

SESWIN settings

○ Set transducer's draught in SESWIN "System Setup – Settings – General – System".
○ Check incoming SIS (navigation) data
○ Check incoming motion sensor data
○ Check all other settings in the "System Setup" dialogs.

System check / preparing survey start

○ Make sure the transducer is below water level and covered by water all times.
○ Switch on the transmitter [F4].
○ Set the range appropriate to find the seafloor.
○ Optimize the gain settings for both channels.
○ Optimize the range settings.
○ Optimize frequency, pulse length and gain settings.
○ Check and optimize the signal processing settings.
○ Check the settings for annotation, profile number and marker counter