

Reference manual

Simrad EK80

Scientific wide band echo sounder





Simrad EK80
Scientific wide band echo sounder
Reference manual
Release 1.8.x

This manual provides you with reference information required to operate and fully understand the commands, menus, operational modes and options provided by the Simrad EK80 Scientific wide band echo sounder.

Note _____

The EK80 echo sounder must never be powered up when the ship is in dry dock. The transducer will be damaged if it transmits in open air. To prevent inadvertent use of the EK80, disconnect the mains power whenever the vessel is in dry dock.

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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. The user 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

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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 <http://www.simrad.com>. On this website you will also find a list of our dealers and distributors.

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About this manual

Purpose of 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 will also provide you with a thorough understanding of the EK80 parameters and adjustments.

A good understanding of system functions and controls is essential to fully take advantage of the functionality provided. Sea conditions vary, sometimes drastically, and it is not possible to identify settings that will provide the best data at all times. Careful study of the information in this manual is highly recommended, preferably while exploring the system's functionality.

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.

We assume that you are familiar with the basic acoustic principles of sound in water, and that you have some experience with scientific use of sonars and/or echo sounders.

On-line information

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

- <http://www.simrad.com/ek80>

Our website will also give you 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 to software version 1.8.x.

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Simrad EK80

Topics

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[Split beam, wideband and depth rated transducers, page 25](#)

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Important

As with all other advanced instruments, there are a few important things that you must be aware of.

Before you switch on the EK80

Before you power up the EK80, make sure that the transducer is submerged in water!

Caution

You must never power up the EK80 when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

When the EK80 is not used

When you do not use the EK80, switch 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). Use the on/off switch on the power supply, or disconnect the power cable.

When you are docking your vessel

If the transducer is activated when out of water it may be damaged beyond repair. It is therefore very important that the EK80 system remains switched off when the vessel is in dry dock, and that no one tries to use it.

To ensure that this can not happen, disconnect the power supply cable to the either the Processor Unit or the transceiver(s) - or both! You may also remove the circuit breakers on the AC mains supply to the EK80 transceiver(s). Do this before the vessel is placed in the dry dock!

As an extra safety measure, the EK80 is by default powered up with the transmit power disabled.

If something breaks down

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

- <http://www.simrad.com>

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

When you wish to switch off the EK80

You must NEVER switch off the EK80 by means of the on/off switch on the Processor Unit. You must ALWAYS exit the EK80 program by clicking the **Exit** button on the top bar.

WARNING

If you power down the EK80 by means of the power switch on the Processor Unit you may damage the software program and the interface parameters used to communicate with external devices.

Rules for transducer handling

A transducer must always be handled as a delicate item. Wrongful 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, sand blasting, metal tools or strong solvents to clean the transducer face.

Related topics

[Support information, page 30](#)

[Network security, page 29](#)

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 wide band 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 research purposes. In a typical configuration, the EK80 will comprise:

- A Display
- B One Processor Unit
- C An Ethernet switch
- D One or more transceiver units
- E One or more single- or split beam transducers

The EK80 can work with the Simrad General Purpose Transceiver (GPT), the Wide Band Transceiver (WBT) and the EK15 Transceiver.

Related topics

[Key features, page 18](#)

[System diagram, page 20](#)

Key features

The Simrad EK80 is a high precision scientific echo sounder. It offers unique features for modern research vessels and environmental monitoring installations that require high quality scientific data.

- Split beam

- FM (linear) and CW pulse forms
- Real-time display of frequency responses, both volume backscatter (Sv) and target strength (TS)
- High dynamic range
- Raw data recording with network interface
- Low self noise
- High ping rate (> 40 Hz)
- Multi frequency (10 to 500 kHz) and wideband application for species identification
- Simultaneous transmission of all frequencies
- More than ten transceivers can run simultaneously or sequentially
- Several frequencies covering same sampling volume
- Wide band frequency sweep ("chirp") in combination with advanced signal processing gives an exceptionally good signal to noise ratio and range resolution
- Remote control
- Store and reload personal settings
- Built-in FM and CW calibration

Related topics

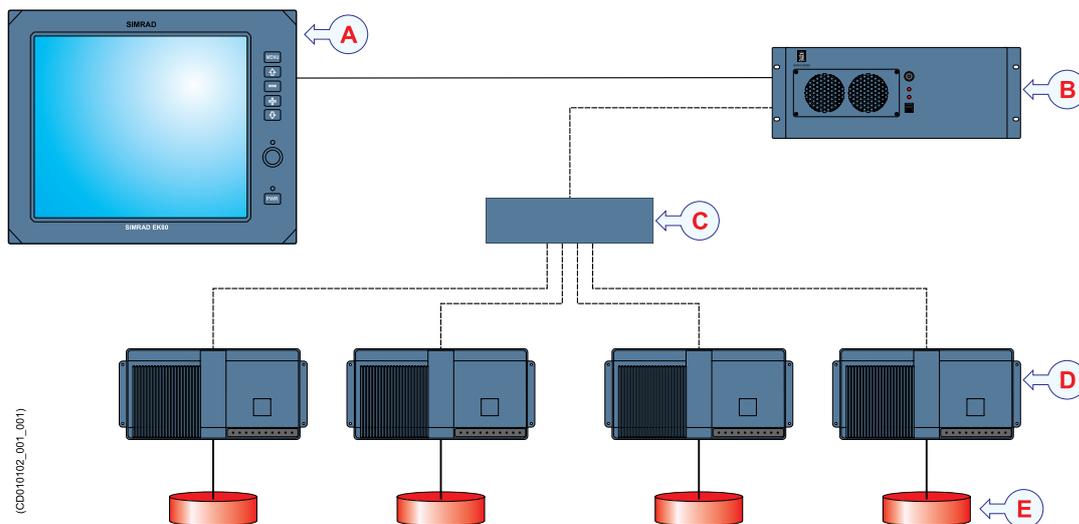
[System description, page 17](#)

System diagram

The system diagram identifies the main components of a basic EK80 system, as well as the connections between the units. Interface capabilities and power cables are not shown.

The basic Simrad EK80 Scientific wide band echo sounder consists of one transducer, one Wide Band Transceiver (WBT) and one Processor Unit (computer).

Additional transceivers and transducers can be added to meet your operational and functional requirements.



- A** *Display*
- B** *Processor Unit*
- C** *Ethernet switch*
- D** *Wide Band Transceiver (WBT)*
- E** *Transducer*

Post-processing software applications may be provided from third party suppliers. See our website for more information.

- <http://www.simrad.com>

Note

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.

Related topics

[System description, page 17](#)

Main system units

Topics

[Display description, page 21](#)

[Processor Unit description, page 22](#)

[Ethernet switch, page 22](#)

[Wide Band Transceiver \(WBT\) description, page 23](#)

[Transducers, page 24](#)

Display description

A display is a required part of the EK80 Scientific wide band echo sounder. For best readability, the display must be located so that it is best protected from glare, and with the correct height and angle.

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

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.

Tip

The Processor Unit offers two video outputs. Two displays may therefore be used to see the EK80 presentations. You may place the two displays next to each other. You may also choose to place the second display at an other location on the vessel.

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

Processor Unit description

The Processor Unit is the computer that controls the EK80 system. It is a vital part of the EK80 Scientific wide band echo sounder. It contains the operational software, and offers the user interface that allows you to control the EK80. It also controls the interface to peripheral devices.

The computer must comply to the requirement specifications provided by Microsoft for their operating systems. It must also provide the necessary interface facilities (serial lines and Ethernet connections) that your EK80 will need to communicate with peripheral systems. The computer must be designed for rugged use, and the construction must be able to withstand the vibrations and movements of a vessel. The operating system must be Microsoft Windows® 7.



A high quality Ethernet adapter is required. If you wish to connect the Processor Unit to the ship's network, you will need two Ethernet adapters.

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

The Processor Unit is normally mounted on the bridge or in a scientific laboratory.

Note

*The Ethernet adapter communicating with the Wide Band Transceiver (WBT) must offer a **Receive Buffers** function. This parameter must be set to its maximum value if more than one Wide Band Transceiver (WBT) is used.*

The Processor Unit is not a standard part of the EK80 delivery. A suitable computer may be provided with the EK80 system. The Processor Unit is designed for rugged use, and customized by Kongsberg Maritime. Except from the fans, it contains no moving parts. It is based on a commercial design, but the software and hardware has been specified and assembled by Kongsberg Maritime to suit the EK80 requirements. It is set up with all necessary software. Consult your local dealer or agent for more information.

Ethernet switch

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

If you use more than one Wide Band Transceiver (WBT) in your EK80 system, you must use an Ethernet switch to connect each Wide Band Transceiver (WBT) to the Processor Unit.

The Ethernet switch is by default not included in the EK80 delivery, but this is a commercial item that can be purchased locally.

Note

Make sure that your selected switch has a large bandwidth capacity. Minimum 1 Gb (1000BASE-T) is required. You must also make sure that all Ethernet cables are type Cat 5e or better. A slower switch - or low quality cables – will decrease the operational performance of the EK80.

1000BASE-T (also known as IEEE 802.3ab) is a standard for gigabit Ethernet over copper wiring. Each 1000BASE-T network segment can be a maximum length of 100 meters (330 feet), and must use Category 5 cable or better (including Cat 5e and Cat 6).

Wikipedia, April 2014

Wide Band Transceiver (WBT) description

The EK80 Wide Band Transceiver (WBT) is provided to transmit the acoustic energy into the water. To do this, the transceiver computes and generates the electric signals sent to the transducer to form a transmission - a 'ping'. After each transmission, it will receive the echoes from the targets in the water column and/or the seabed. These are filtered and amplified, and then converted to digital format.

The EK80 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 and displayed.



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 transceiver operates within a large frequency band, and supports single frequencies, frequency sweep (chirp) and user defined wave forms.

The design is optimized for applications where power consumption and physical size is not critical, typically on board a vessel or a platform with power and communication available through high speed Ethernet cable.

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.

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.

The EK80 WBT requires an external power supply offering 12 to 15 Vdc, minimum 5 A. A suitable power supply is provided with the delivery.

Transducers

The EK80 Scientific wide band echo sounder can be used with all our single beam and split beam transducers.

Kongsberg Maritime can provide a large range of efficient and accurate Simrad transducers for fishery and fishery research applications.

A wide range of operational frequencies is available.

Simrad 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 will fit more than one category.

For more information about the transducers provided by Kongsberg Maritime, consult the Simrad website.

- <http://www.simrad.com>



Related topics

[Split beam transducers, page 25](#)

[Wideband transducers, page 26](#)

[Depth rated transducers, page 26](#)

[Physical dimensions versus beam opening, page 27](#)

Split beam, wideband and depth rated transducers

Simrad 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 will fit more than one category.

Topics

[Split beam transducers, page 25](#)

[Wideband transducers, page 26](#)

[Depth rated transducers, page 26](#)

[Physical dimensions versus beam opening, page 27](#)

Split beam transducers

A split beam transducer is design to transmit the acoustic pulse using one beam, while receiving the echoes in three or four individual channels.

Variations in phase of the returned echoes enable us to locate the target within the acoustic beam. Once you know the location of a target you can make up for variations in the beam patterns, and in the end you can record calibrated target tracks within the acoustic beam.

Simrad commercialized this technology in the 1980's. Our split beam echo sounders are now used to record data for marine resource management worldwide.

For more information about the split beam transducers provided by Simrad, consult our website.

- <http://www.simrad.com>

The following split beam transducers are recommended for the Simrad EK80 Scientific wide band echo sounder.

Model	Order number	Nominal frequency (kHz)	Opening angle	Material
ES18	KSV-088694	18	11°	Ceramic
ES38-10	KSV-202714	38	10°	Ceramic
ES38-7	321842	38	7°	Ceramic
ES70-7C	KSV-203678	70	7°	Composite
ES120-7C	KSV-204580	120	7°	Composite
ES200-7C	KSV-203003	200	7°	Composite
ES333-7C	322598	333	7°	Composite

Related topics

[Transducers, page 24](#)

Wideband transducers

A wideband transducer can transmit and receive on a large frequency range, for example 45 to 90 kHz, 85 to 170 kHz or 150 to 300 kHz. This means you only need three transducers to cover the entire frequency range from 45 to 300 kHz.

In order to design a transducer that is capable of providing this frequency range, composite technology is our preferred production technique. All our wideband transducers are produced using composite material.

When a wideband transducer is combined with a wideband transceiver it is possible to make sweep transmissions. In these, the transmit frequency continuously increases throughout the transmitted pulse. This functionality is often referred to as a "chirp".

It is also possible to transmit on several discrete frequencies, one at a time.

If you are an advanced user, you can define an arbitrary signal, such as a dolphin's click. This opens up a whole new world in interpretation of the echo, taking a great step forward towards the goal of providing a species identification echo sounder, or "ecosounder".

For more information about the wideband transducers provided, consult the Simrad website.

- <http://www.simrad.com>

The following wideband transducers are recommended for the Simrad EK80 Scientific wide band echo sounder. Note that these are all split beam transducers.

Model	Order number	Frequency (kHz)	Opening angle	Material
ES70-7C	KSV-203678	50 - 90	7°	Composite
ES120-7C	KSV-204580	85 - 170	7°	Composite
ES200-7C	KSV-203003	160 - 300	7°	Composite
ES333-7C	322598	250 - 500	7°	Composite

Related topics

[Transducers, page 24](#)

Depth rated transducers

Sometimes collecting data from a vessel simply does not do the job for you. Perhaps you need to place the transducer in deeper waters closer to the target for better resolution. You must then use a transducer that can handle the increased water pressure.

If it is necessary to place the transducer in deeper waters, you can use a towed body. You can also place the transducer on the seabed for long term collection of data. We have for many years designed and built transducers for deep water applications like this. Our

series of 7° depth rated transducers have standard depth rating to 1500 meters. We can also build transducers for greater depths.

For more information about the depth rated transducers provided, consult the Simrad website.

- <http://www.simrad.com>

The following depth rated transducers are recommended for the Simrad EK80 Scientific wide band echo sounder. Note that all these are also split beam transducers. Standard depth rating is 1500 meters. If you need to work on larger depths, feel free to contact us for advice.

Model	Order number	Nominal frequency (kHz)	Opening angle	Material
ES38DD	KSV-113392	38	7°	Ceramic
ES70-7CD	335039	70	7°	Composite
ES70-18CD	321637	70	18°	Composite
ES120-7CD	324410	120	7°	Composite
ES200-7CD	KSV-207134	200	7°	Composite
ES333-7CD	312902	333	7°	Composite

Related topics

[Transducers, page 24](#)

Physical dimensions versus beam opening

The physical dimensions of a transducer can be explained as a function of the beam opening at a given operating frequency.

Traditionally, a 7° opening angle has been the standard for marine surveys. However, for applications where the physical size and weight of the transducer is important, you can reduce the size by allowing a larger opening angle of the acoustic beam.

The effective circular area of the transducer face is calculated from the equation:

$$A \cong \left(\frac{\lambda}{2\beta}\right)^2 \times \pi$$

Where:

- A =effective transducer circular area
- λ =wave length
- β =beam width in radians (-3 dB points)

The transducer near field is the region right in front of the transducer face, where the sound waves are complicated and does not fall off spherically with range. Targets within the near field will not be detected correctly. The near field is calculated by the equation:

$$\text{Near field} \cong \frac{A}{\lambda}$$

Parameters from typical scientific transducers are given in the table. The maximum and minimum source level (SL) is calculated from the available power settings on the Simrad EK80 scientific echo sounder.

Frequency	Wavelength	Beam width	Max/Min SL	Effective circular area	Near field
18 kHz	83 mm	11°	225/215 dB	1479 cm ²	178 cm
38 kHz	39 mm	7°	229/219 dB	820 cm ²	208 cm
70 kHz	21 mm	7°	227/217 dB	242 cm ²	113 cm
120 kHz	13 mm	7°	222/212 dB	82 cm ²	66 cm
200 kHz	8 mm	7°	220/212 dB	30 cm ²	39 cm
333 kHz	5 mm	7°	212/209 dB	11 cm ²	24 cm

Related topics

[Transducers, page 24](#)

Network security

If a EK80 system is connected to the ship's local area network, data security is of vital importance.

Equipment manufactured by Kongsberg Maritime are frequently connected to the ship's local area network (LAN). Connecting any computer to a network will always expose the data on that computer to all other computers connected to the same network. 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 connection will do any of the above.
- 2 The damage done if a remote connection succeeds doing this.

Because Kongsberg Maritime has no information regarding the complete system installation on any vessel, we can not estimate the threat level and the need for network security. For this reason, we can not accept responsibility for network security. Systems provided by Kongsberg Maritime are regarded as stand-alone offline systems, even though they may be connected to a network for sensor interfaces and/or data distribution.

Note

No network safety applications are installed on any Kongsberg Maritime computers. The computers are thus not protected against viruses, malware or unintentional access from 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 or access to the EK80.

Related topics

[Important, page 16](#)

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.

Norway (Main office)

- **Company name:** Kongsberg Maritime AS / Simrad
- **Address:** Strandpromenaden 50, 3190 Horten, Norway
- **Telephone:** +47 33 03 40 00
- **Telefax:** +47 33 04 29 87
- **Website:** <http://www.simrad.no>
- **E-mail address:** simrad.support@simrad.com

Spain

- **Company name:** Simrad Spain
- **Address:** Poligono Partida Torres 38, 03570 Villajoyosa, Spain
- **Telephone:** +34 966 810 149
- **Telefax:** +34 966 852 304
- **Website:** <http://www.simrad.es>
- **E-mail address:** simrad.spain@simrad.com

France

- **Company name:** Simrad France
- **Address:** 5 rue de Men Meur, 29730 Guilvinec, France
- **Telephone:** +33 298 582 388
- **Telefax:** +33 298 582 388
- **Website:** <http://www.simrad.fr>
- **E-mail address:** simrad.france@simrad.com

USA

- **Company name:** Kongsberg Underwater Technology Inc / Simrad Fisheries
- **Address:** 19210 33rd Ave W, Lynnwood, WA 98036, USA
- **Telephone:** +1 425 712 1136
- **Telefax:** +1 425 712 1193
- **Website:** <http://www.simrad.com>
- **E-mail address:** fish.usa.support@simrad.com

Malaysia

- **Company name:** Kongsberg Maritime Malaysia Sdn. Bhd
- **Address:** Unit 27-5 Signature Offices, The Boulevard, Mid Valley City, Lingkaran Syed Putra, 59200 Kuala Lumpur, Malaysia
- **Telephone:** +65 6411 7488
- **Telefax:** +60 3 2201 3359
- **Website:** <http://www.simrad.com>
- **E-mail address:** simrad.asia@simrad.com

Korea

- **Company name:** Kongsberg Maritime Korea Ltd
- **Address:** #1101-Harbor Tower, 113-1, Nampodong 6-Ga, Jung-Gu, Busan 600-046 Korea
- **Telephone:** +82-51-242-9933
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- **Website:** <http://www.simrad.com>
- **E-mail address:** simrad.korea@simrad.com

Related topics

[Important, page 16](#)

Getting started

Topics

[Read this first, page 33](#)

[Powering the EK80 on and off, page 37](#)

[Starting normal operation, page 40](#)

[Using the key functionality, page 52](#)

[User interface, page 62](#)

[Depth layers in the echogram views, page 70](#)

[Setting up the EK80 Scientific wide band echo sounder for the first time, page 73](#)

[Online help description, page 85](#)

[Assembling a portable system, page 86](#)

Read this first

"Getting started" is all about powering up the EK80 Scientific wide band echo sounder for the first time: either because the EK80 has just been unpacked or installed, or because you are a first time user on an existing system.

The following user scenarios have been defined:

- 1 New installation
- 2 New user
- 3 New portable system

Caution

You must never power up the EK80 when the ship is in dry dock. The transducer will be damaged if it 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 measures should be considered.

Topics

[New installation, page 33](#)

[New user, page 34](#)

[New portable system, page 35](#)

New installation

If this is a new system that is about to be put to use, you must first install the software, and then the license key(s). Following this you must set up the transceiver(s) with their respective transducer(s).

Note

We assume that all the hardware units - computer, transceiver(s) and transducers(s) - have been previously installed. This is described in the EK80 Installation manual.

The following software tasks are relevant. Some of them may have been done during the installation.

- 1 Power up the Processor Unit.
- 2 Install the EK80 software.
- 3 Set up the Ethernet adapter on the Processor Unit for communication with the Wide Band Transceiver (WBT).
- 4 Start the EK80 program, and insert the license key(s).

- 5 If relevant, adjust the screen resolution.
- 6 Select which transducer(s) you wish to use.
- 7 Configure each Wide Band Transceiver (WBT).
- 8 Start "pinging".
- 9 Investigate the features and functionality offered by the EK80.

See the basic operational procedures in this chapter.

For more detailed information, consult the operational procedures chapter and/or the function and dialog box descriptions.

Tip

All information related to EK80 operation is available in the context sensitive on-line help.

Related topics

[Installing the EK80 operational software, page 75](#)

[Obtaining and installing the software license, page 77](#)

[Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver \(WBT\)., page 79](#)

[Installing one or more transducers, page 80](#)

[Installing transceiver channels, page 82](#)

[Adjusting the screen resolution, page 84](#)

New user

If you are a new user about to operate an existing EK80 Scientific wide band echo sounder, you must simply power it up. Then, observe the basic information and operational procedures in this chapter to get acquainted with the system.

Note

We assume that all the hardware units - computer, transceiver(s) and transducers(s) - have been previously installed. This is described in the EK80 Installation manual.

The following software tasks are relevant.

- 1 Power up the Processor Unit.
- 2 Start the EK80 program.
- 3 Verify that the transducer(s) and the transceiver(s) are all set up and configured.
- 4 Start "pinging".

- 5 Investigate the features and functionality offered by the EK80.

See the basic operational procedures in this chapter.

For more detailed information, consult the operational procedures chapter and/or the function and dialog box descriptions.

Tip

All information related to EK80 operation is available in the context sensitive on-line help.

Related topics

[Starting normal operation, page 40](#)

[Using the key functionality, page 52](#)

[User interface, page 62](#)

[Depth layers in the echogram views, page 70](#)

New portable system

If this is a new portable system that is about to be put to use, you must first unpack the main units and connect them together. After this you must install the EK80 software, and then the license key(s). Finally, you must set up the transceiver(s) with their respective transducer(s).

The following tasks are relevant.

- 1 Unpack the various units that comprise the EK80 system: Processor Unit (computer), transceiver(s) and transducer(s).
- 2 Connect the units together as indicated in the system diagram.
- 3 Connect power from AC mains or battery.
- 4 Power up the Processor Unit.
- 5 Install the EK80 software.
- 6 Set up the Ethernet adapter on the Processor Unit for communication with the Wide Band Transceiver (WBT).
- 7 Start the EK80 program, and insert the license key(s).
- 8 If relevant, adjust the screen resolution.
- 9 Select which transducer(s) you wish to use.
- 10 Configure each Wide Band Transceiver (WBT).
- 11 Start "pinging".

- 12 Investigate the features and functionality offered by the EK80.

See the basic operational procedures in this chapter.

For more detailed information, consult the operational procedures chapter and/or the function and dialog box descriptions.

Tip

All information related to EK80 operation is available in the context sensitive on-line help.

Related topics

[System diagram for a portable EK80 system, page 86](#)

[Assembling a portable system, page 86](#)

[Installing the EK80 operational software, page 75](#)

[Obtaining and installing the software license, page 77](#)

[Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver \(WBT\)., page 79](#)

[Installing one or more transducers, page 80](#)

[Installing transceiver channels, page 82](#)

[Adjusting the screen resolution, page 84](#)

Powering the EK80 on and off

Topics

[Powering up the EK80, page 37](#)

[Powering down the EK80, page 39](#)

Powering up the EK80

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

Prerequisites

This procedure assumes that you have connected one or more transceivers to the EK80 Processor Unit.

Context

The EK80 software is not automatically started when the Processor Unit is powered up. Once the operating system has started, you must click the icon on the desktop.

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

Caution

You must never power up the EK80 when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Procedure

- 1 Verify that the EK80 transceiver(s) are switched on.
The Wide Band Transceiver (WBT) power supply is fitted with an on/off switch.
- 2 Power up the display(s).
If required, refer to the instructions provided by the display manufacturer.
- 3 Power up the Processor Unit.
If required, refer to the instructions provided by the computer manufacturer.
Wait for the operating system to start up.
- 4 Double-click the EK80 icon on the Processor Unit desktop to start the program.
Wait while the EK80 program starts.

- 5 Choose 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.

- 7 For normal operation, select *Normal* mode using the **Operation** button on the **Operation** menu.



- 8 Set **Ping** to *On* to activate "pinging".

When the EK80 program has started, the icon for the **Operation** menu will flash to remind you that "pinging" is disabled. This is for safety reasons. You must manually start "pinging" by means of the **Ping** button on the **Operation** menu.



- 9 Click **Ping Mode**, and set it to *Interval*.

- 10 Click [+] or [-] on **Ping Interval** to select a suitable fixed time between each "ping".



- 11 Observe that the EK80 starts.

Result

The EK80 starts up using the same operational parameters as the last time you used it. If these parameters are acceptable, continue operation. If you wish to alter basic operational parameters, see the relevant procedures.

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 meters 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

- [Powering down the EK80, page 94](#)
- [User Settings dialog box, page 324](#)
- [Operation function, page 333](#)
- [Ping function, page 338](#)
- [Ping Mode function, page 340](#)

Powering down the EK80

You must NEVER switch off the EK80 by means of the on/off switch on the Processor Unit. You must ALWAYS exit the EK80 program by clicking the **Exit** button on the top bar.

Context

When you do not use the EK80, switch 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). Use the on/off switch on the power supply, or disconnect the power cable.

Procedure

- 1 Click the **Exit** button on the top bar.

Observe that the EK80 program closes down.

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



- 3 Switch off the display(s).

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

- 4 Switch off the transceiver(s).

The transceiver is not provided with an on/off switch.

Unless a dedicated solution has been provided during the installation to facilitate power on/off, you can leave the transceiver(s) on. However, if you know that the EK80 is not to be used for a longer period of time, disconnect the power to the transceiver(s).

Related topics

- [User Settings dialog box, page 324](#)
- [Operation function, page 333](#)
- [Ping function, page 338](#)
- [Ping Mode function, page 340](#)
- [Powering up the EK80, page 92](#)

Starting normal operation

Topics

- [Introduction to the basic procedures, page 40](#)
- [Selecting *Normal* operational mode, page 41](#)
- [Checking the transceiver and transducer settings, page 42](#)
- [Selecting which echogram type to use, page 43](#)
- [Adjusting the echo sensitivity, page 45](#)
- [Choosing Range and Start Range, page 46](#)
- [Choosing echogram colours, page 48](#)
- [Checking the bottom detection settings, page 49](#)
- [Opening the context sensitive on-line help, page 50](#)

Introduction to the basic procedures

Once you have powered up the complete EK80 system, and started the EK80 program, you are ready to start the actual operation.

Observe these brief procedures to familiarize yourself with the basic operation.

When started up, the EK80 will automatically apply its previous setup parameters. These procedures are partly provided to get you acquainted with the basic functionality provided by the EK80, and partly to set up the system for normal use. If you already know the EK80, or the current operational parameters are acceptable, you may not need to do any of these procedures.

Note

The procedures assume that the EK80 has at least one frequency channel (transceiver and transducer) readily connected. If this is not the case, observe the relevant installation procedures.

Selecting *Normal* operational mode

In order to start transmitting ("pinging") you must set the EK80 to *Normal* operational mode.

Context

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

WARNING

You must never start "pinging" when your vessel is in dry dock. Transmitting in air will damage the transducer beyond repair.

Once started, the EK80 transmissions are controlled by the **Ping Mode** and **Ping Interval** functions, as well as the settings in the **Normal Operation** dialog box.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Operation**, and set it to *Normal*.



The system is now ready for transmission.

- 3 Click **Ping**, and set it to *On*.



- 4 Click **Ping Mode**, and set it to *Interval*.

- 5 Click [+] or [-] on **Ping Interval** to select a suitable fixed time between each "ping".



Result

The EK80 is now transmitting acoustic pulses 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 meters 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

[Operation function, page 333](#)

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

Checking the transceiver and transducer settings

The EK80 will only operate properly when connected to the correct transceiver(s) and transducer(s).

Prerequisites

This procedure assumes that the EK80 has been powered up.

Procedure

1 Verify that the currently connected transducer(s) are shown as tabs on the status bar at the bottom of the EK80 presentation.

2 Observe the **Main** menu.

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

3 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

4 Click the **Installation** button.



a Observe that the **Installation** dialog box opens.

b On the left side, click **Transceiver**.

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

5 Check that all applicable transceivers and transducers are connected and operational.

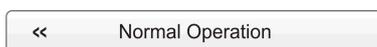
For each transceiver, this is indicated by the green label with text “Installed”.

6 Click **OK** to save the chosen parameters and close the dialog box.

7 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

8 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

9 For each frequency channel (transceiver/transducer combination):

a Set **Mode** to *Active*.

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

- c Set **Power** to the correct power level for the transducer.
- d Check that the **Depth** value is set correctly.

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.

- 10 Click **OK** to save the chosen parameters and close the dialog box.

Selecting which echogram type to use

Three different echogram types may be presented by the EK80. For each channel you must choose to use one of them.

Context

The following echogram types are available.

- **Surface echogram**

The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

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

- **Bottom echogram**

The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

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

- **Pelagic echogram**

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

In the pelagic echogram the calculations will disregard any bottom detection. All calculations are thus 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 echogram**

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

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

Procedure

- 1 Click once in the echogram view that you wish to change.

This will make the view "active". A thick border is placed on the selected view to visualize this.

- 2 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 3 Click **Echogram**.



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

- 4 In the **Echogram** dialog box, click the **Echogram** tab.
- 5 Select the echogram type you wish to apply to the chosen view.
- 6 If you wish to use a sidescan echogram, specify the sidescan options by defining which side of the vessel each transducer is located.
- 7 Apply the change(s) you have made.
 - a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
 - b Click **Apply to all** if you wish to use apply the change to all the echogram views.
- 8 Click **OK** to save the chosen parameters and close the dialog box.

Further requirements

Set up the **Range** and **Start Range** values you wish to use for the chosen echogram(s).

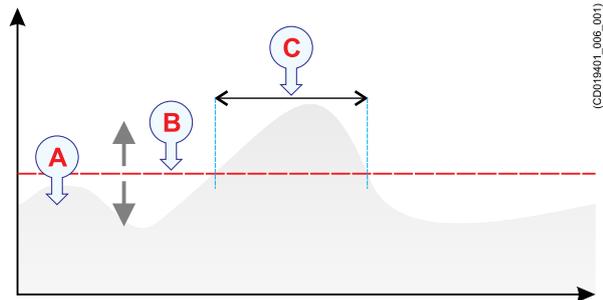
Adjusting the echo sensitivity

On the EK80 you do not change the actual gain in the receiver, but the minimum level of the colour scale. When the 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.

By default, the Minimum Level setting applies only to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box. If you wish to adjust the Minimum Level on all similar echograms in your view, click to select **Apply to all**.



The echo strength (A) will vary with time. The Minimum Level (B) may be adjusted up or down. Reducing the level will increase the sensitivity. Only echoes over the Minimum Level will be shown in the echogram (C).

Procedure

- 1 Observe the **Minimum Level** button on the **Main** menu.



- 2 **Method 1**
 - a Click [+] or [-] to choose the level.
- 3 **Method 2**
 - a Click the middle of the **Minimum Level** button, hold the mouse button depressed.
 - b Drag the cursor sideways to increase or decrease the level.
- 4 **Method 3**
 - a Click the middle of the **Minimum Level** button to open the submenu.
 - b Type the requested level.

Note

You can only use this method if you have computer keyboard connected to your Processor Unit.

Related topics

[Gain function, page 329](#)

Choosing Range and Start Range

In all echograms, the start depth of the echogram is defined by the **Start Range** depth value. The range starting from this chosen start depth is defined by the **Range** value.

Context

The range setting defines how "deep" you wish the EK80 to detect echoes, that is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies this "bottom" depth, while the **Start Range** setting specifies the "top" depth.

- **Surface echogram**

The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

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

- **Bottom echogram**

The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

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

- **Pelagic echogram**

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

In the pelagic echogram the calculations will disregard any bottom detection. All calculations are thus 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 echogram**

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

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

Procedure

- 1 Observe the **Main** menu.

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

- 2 On the **Main** menu, click **Start Range** to activate the function.



- 3 Choose the **Start Range** value.

Remember that in a bottom echogram, this value must be negative.

Use any of the following methods to change the depth range.

- a Click [+] or [-] to adjust the range manually.
 - b Click the middle of the button, hold the mouse button depressed, and drag sideways.
 - c Click the middle of the button to open it, then type the requested range on the keyboard.
- 4 On the **Main** menu, click **Range** to activate the function.



- 5 Choose the **Range** value.

Use any of the following methods to change the depth range.

- a Click [+] or [-] to adjust the range manually.
- b Click the middle of the button, hold the mouse button depressed, and drag sideways.
- c Click the middle of the button to open it, then type the requested range on the keyboard.

Choosing echogram colours

Several different colour scales are predefined and available for the presentation of echograms. You can easily choose which colours to use.

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.

12 colours

Sonar colours

Echogram colours

Grayscale

BI500 colours



The **Echogram colours** scale is based on the standard 12-colour scale, but additional colours have been added between these to make smoother colour transitions.

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 clicking the **Colour Scale** icon on the top bar.

The currently selected colour scale is shown at the bottom of the EK80 presentation.

Tip

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



Procedure

- 1 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- 2 Click **Colour Setup**.



Observe that the **Colour Setup** dialog box opens.

- 3 Select the number of colours you wish to use.

Note

If you wish to apply the predefined colour scales you must select 64 colours.

- 4 Select the colour scale you wish to use.
- 5 Click **Apply** if you wish to preview the choice you have made.
- 6 Click **OK** to save the chosen parameters and close the dialog box.

Checking the bottom detection settings

Bottom detection is important for accurate use of the EK80. Occasionally, difficult environmental, water or bottom conditions may inhibit bottom lock. The **Bottom Detection** dialog box is provided to rectify this.

Prerequisites

This procedure assumes that the EK80 is operational.

Context

The **Bottom Detection** parameters provide separate limits for minimum and maximum depth. These limits may be used to obtain "bottom lock" on the depth when the EK80 is pinging. The EK80 needs this lock to locate the correct depth, and to stay on it during the operation, even though the depth changes continuously.

Procedure

- 1 Observe the **Main** menu.
Its default location is on the right side of the EK80 presentation.
- 2 Click the **Active** icon.
This icon is located under the **Main** menu. It is used to open the **Active** menu.
- 3 On the menu, click **Bottom Detection**.



Observe that the **Bottom Detection** dialog box opens.

- 4 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 surface and down to the depth you have chosen.
 - Set the **Maximum Depth** to approximately 50% more than the expected depth. If the EK80 should lose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined.

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 then not be able to 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 the function. This can be useful when you only wish to study targets in the water column. Use the dedicated option in the **Bottom Detection** dialog box.*

- 5 Click **OK** to save the chosen parameters and close the dialog box.

Opening the context sensitive on-line help

The EK80 is provided with an extensive context sensitive on-line help system. All information of the EK80 *Reference manual* is also provided in the on-line help.

Context

The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Note

Due to limitations defined by Microsoft®, CHM files will not open from websites and servers.

To open the help system, click the **Help** button in any dialog box. This will provide instantaneous information about the relevant dialog box with links to related procedures and topics.

Navigation in the on-line help file is made by means of the menu system on the left side, as well as the interactive links in the document.

Note

The on-line help may not be available in the language you have chosen for the user interface. By default, the English on-line help will then be used.

Procedure

- 1 Click the **Help** button on the top bar.

This will open the on-line help file on its start page. Observe the menu on the left side, or use the search functionality.



- 2 Click the **Help** button in any dialog box.

The description of the related dialog box will appear in the help window.

Using the key functionality

Topics

[Defining the file and folder settings for raw data recording, page 52](#)

[Defining the file and folder settings for processed data recording, page 53](#)

[Recording raw data, page 54](#)

[Recording processed data, page 56](#)

[Calibration summary, page 57](#)

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's hard disk - or on an external data storage device - according to the preferences you have defined.

Context

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

Set up the file and folder parameters before you start the recording.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 On the **Operation** menu, click **Output**.



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

- 3 On the left side, click **File Setup** to open the page.
- 4 On the **File Setup** page, define the relevant file and folder properties.
- 5 Click **OK** to save the chosen settings and close the dialog box.

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

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

Set up the file and folder parameters before you start the recording.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 2 On the **Operation** menu, click **Output**.



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

- 3 On the left side, click **File Setup** to open the page.
- 4 On the **File Setup** page, define the relevant file and folder properties.

- 5 On the left side of the **Output** dialog box, click **Processed Data Output** to open the page.
- 6 Select a file output format from the drop-down list, and click **Add** on the right side. Observe that the **Processed Data Output Configuration** dialog box opens to record the relevant settings for the chosen output format.
- 7 Choose the settings for the chosen output format.

Note

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

- 8 Click **OK** to close the **Processed Data Output Configuration** dialog box.
- 9 At the bottom of the **Output** dialog box, click **OK** to save the chosen parameters and close it.

Recording raw data

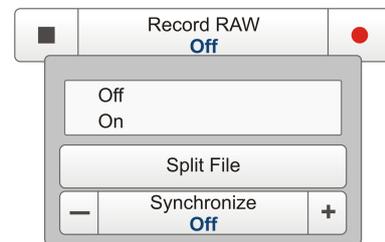
The raw data recording function provided by the EK80 allows you to save echo data on *.raw format to a file on the Processor Unit hard disk, or onto an external disk.

Prerequisites

Before you start raw data recording, make sure that you have defined where to store the data files.

Tip

*On the **Operation** menu, click **Output**→**File Setup** to define the recording parameters.*



Context

On the EK80, you can save and recall echo information in the following ways.

- Screen captures
- Raw data
- History file

You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.

Note

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 To start raw data recording, click the **Record RAW** button, and select *On*.



The **Record** button on the top bar will change colour to reflect that recording is active.

Tip

Alternatively, simply click the red circle on the right side of the button to start recording.

*To synchronize simultaneous recording of raw and processed data, open the **Record RAW** button, and set **Synchronize** to *On*. With synchronization activated, you will automatically start and stop recording using only the **Record RAW** button on the **Operation** menu, and the **Record** button on the top bar.*

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

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

- 4 To stop raw data recording, click the **Record RAW** button, and select *Off*.

Tip

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

Related topics

[Record RAW function, page 342](#)

Recording processed data

The processed data recording function provided by the EK80 allows you to save processed data to a file on the Processor Unit hard disk, or onto an external disk. Note that this is only an export format. Processed data file can not be played back on the EK80.

Prerequisites

Before you start recording of processed data, make sure that you have defined where you wish to store the data files.

Tip

*On the **Operation** menu, click **Output**→**File Setup** to define the recording parameters.*

Context

The processed data is only an export format, and can not be played back on the EK80. If you wish to save and recall echo information the following methods can be used.

- Bitmap images (containing the full EK80 screen) are saved whenever you click the **Screen Capture** button on the top bar. These images are recalled by means of the **Screen Captures** tab at the bottom of the EK80 presentation.
- Raw data is recorded using the **Record RAW** function on the **Operation** menu. The raw data files may be played back by placing the EK80 in *Replay* mode.
- 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". To play back the history file, click the **History** button on the top bar.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Tip

*You may wish to synchronize the recording of raw and processed data. On the submenu under the **Record RAW** button, set **Synchronize** to **On**. The **Record** button on the top bar will indicate when raw and processed data are recorded simultaneously.*



Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Verify that the **Record Processed** function is available.

If it is unavailable, it is most likely because you have forgotten to specify an output format. Open the **Output** dialog box, and select a format on the **Processed Data Output** page. Remember that not all formats can be saved on a file format.

- 3 To start recording of processed data, click the **Record Processed** button, and select *On*.



Tip

Alternatively, simply click the red circle on the right side of the button to start recording.

*To synchronize simultaneous recording of raw and processed data, open the **Record RAW** button, and set **Synchronize** to *On*. With synchronization activated, you will automatically start and stop recording using only the **Record RAW** button on the **Operation** menu.*

- 4 To stop data recording of processed data, click the **Record Processed** button, and select *Off*.

Tip

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

Calibration summary

In order to maintain the accuracy provided by the Simrad EK80 and that is required for scientific applications, the echo sounder must be calibrated.

Prerequisites

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

- Reference targets (metal spheres) to fit the operational frequencies
- Winch arrangement with relevant lines to lower the sphere into the sound beam

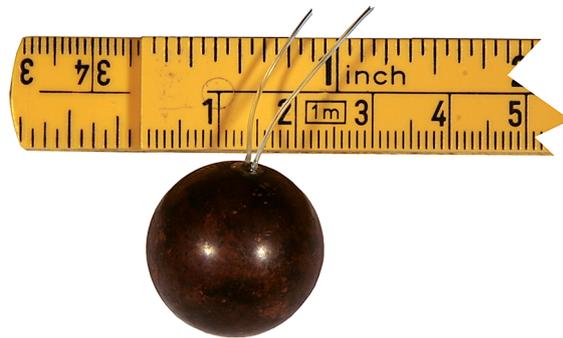
The vessel must be anchored in a suitable position with sufficient depth, and with calm and sheltered water.

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!

Context

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 then compared with the known target strength. During the calibration, the calibration sphere is physically moved inside the sound beam.



A calibration sphere for 120 kHz

If it is necessary to adjust the EK80, this is done automatically by the calibration software. No analogue gain adjustments are required.

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.

Note

If you remove or add a transducer from a calibrated EK80 system, the transceiver must be calibrated one more time. However, you may use the measured target strength (TS) from a previous calibration, as well as the reference target strength for the calibration sphere you used.

*If you have a EK80 system with several transceivers, you must calibrate one by one. Make sure that you set all other transceivers to **Passive** in the **Normal Operation** dialog box.*

A summary of the calibration process is provided.

Procedure

- 1 Prepare the vessel for EK80 calibration.
 - a Locate a suitable area for the calibration.
 - b Prepare a winch arrangement to lower the calibration target (sphere) into the water.
 - c When the vessel has reached the chosen location, lower the sphere into the water and into the sound beam.
 - d Start the EK80.
 - e Set **Operation** to *Normal*.
- 2 In the **Normal Operation** dialog box, set up the following parameters for the channel you wish to calibrate:
 - a Select **Pulse Type**.
 - b Select **Pulse Duration**.
 - c Select **Power**.
 - d If you use FM transmissions:
 - Set **Ramping** to *Slow* if you will be looking at mixture of small and large targets, or small targets near bottom.
 - Set **Ramping** to *Fast* if you are looking at equally sized targets in the water column.
 - e If you use CW transmissions:
 - Set **Ramping** to *Fast*.

- 3 Start the raw data recording.
- 4 Click **Calibration** on the **Setup** menu to open the **Calibration Wizard**.



- 5 On the first page of the wizard, select *New calibration from raw data (Real time or Replay)*, and click **Next**.
- 6 On the second page, select the channel and calibration target (sphere).
- 7 Use the **Sphere Administration** dialog box to remove bands where the calibration sphere shows very unstable target strength with sharp dips (nulls).
- 8 Click **Next**.
- 9 On the third page, adjust the size of the **Calibration Wizard** dialog box so you can also see the echogram with the calibration sphere echoes.
- 10 In the echogram, observe the layer with red lines is shown.
- 11 Use the cursor to drag the red lines above and below the calibration sphere.
 Make sure to make enough space to confine the calibration sphere throughout the calibration procedure.

- 12 Click **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. Otherwise the default values will be OK for most purposes.*

- 13 Click **Start** to load the echo data.
- 14 While importing the echo data, move the sphere throughout the beam cross section.
A coverage in % is indicated for both centre and overall. Try to obtain as high coverage as possible for both.
- 15 When the coverage is acceptable, click **Stop**.
- 16 Stop the raw data recording.
- 17 Click **Next**.
- 18 On the fourth page, open the **TS Data** page to inspect the data.
Click e.g. **Range** on the top bar. Clicking range again, and listing goes from max to min range. In this way, it is easier to find unwanted targets. Remove (suspend) unwanted targets by clicking on them.
 - a Click **Range** on the table heading.
Detections are then listed according to range from minimum to maximum range.
 - b Click **Range** one more time.
Detections are then listed according to range from maximum to minimum range.
 - c Use the Range sorting to identify unwanted target.
 - d Remove (suspend) unwanted targets by clicking on them.
- 19 Click **Reprocess** to run the calibration processing.
- 20 Finalize the calibration process:
 - a When the processing has finished, click **Finish**.
 - b Save the calibration results.
 - c Update the calibration used by the echo sounder; select **Merge** or **Replace**.
 - **Merge** is typically used when you wish to use different pulse lengths on the same channel (transceiver/transducer combination) to make the parameter file more complete and accurate. The calibration data for the channel will then include all the data from all the pulse lengths.
 - **Replace** is typically used when you wish to keep only the latest parameters for the relevant channel (transceiver/transducer combination).
- 21 Close the **Calibration Wizard** dialog box.

Further requirements

Repeat the entire procedure (from step 2) for each channel you wish to calibrate.

User interface

Topics

[EK80 presentation overview, page 62](#)

[Echogram views, page 64](#)

[Top bar description, page 65](#)

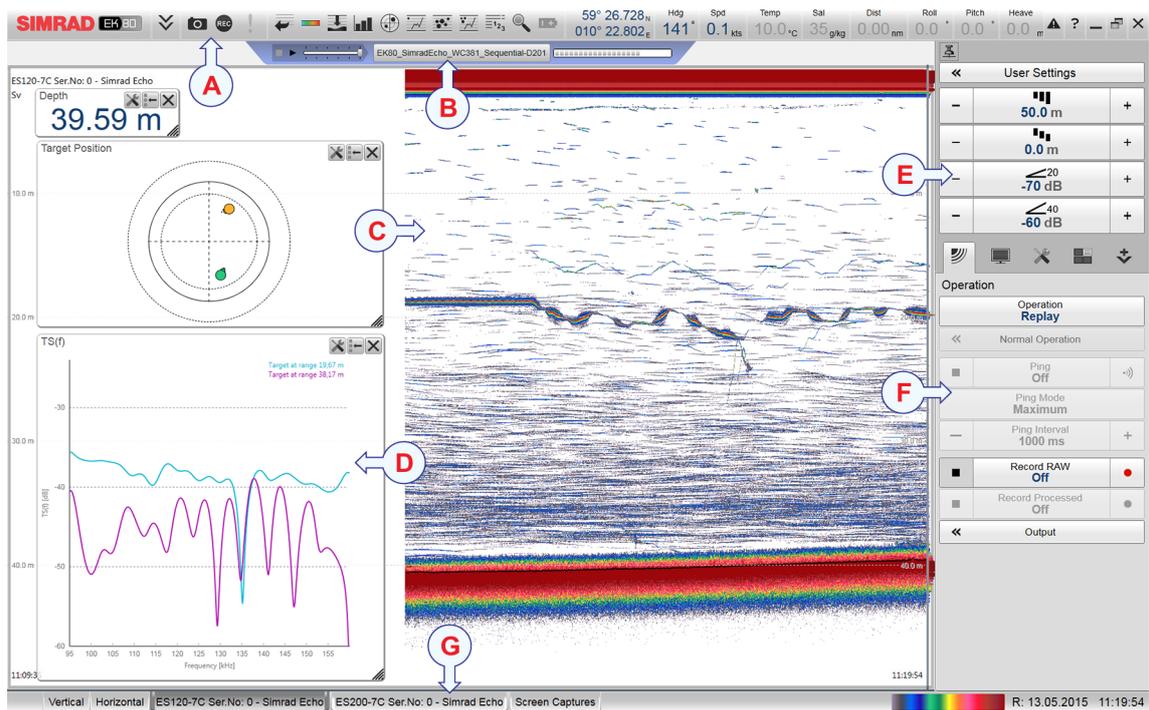
[Information panes, page 67](#)

[Menu system, page 68](#)

EK80 presentation overview

By default, the EK80 presentation covers the entire screen.

This EK80 screen capture shows you a typical operational situation.



The presentation provides you with a lot of information. You can see one echogram views, 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 top bar identifies Simrad as the manufacturer, and the name of the product (EK80). It also provides several information read-outs and buttons. These are used to hide or retrieve the menu system and the information panes, show you navigational information, and to enable basic system functionality.

B Replay bar

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

C Echogram view

The echograms take up the largest part of the EK80 presentation.

By default, you will have one echogram for each frequency channel (transceiver/transducer combination). You can choose which type of echogram you wish to see; *surface related*, *bottom related*, *pelagic* or *trawl*. If you have more than one frequency channel, the echograms for each frequency can be presented horizontally with one over the other, or vertically next to each other. This is controlled by the transducer tabs on the status bar.

This echogram example shows you a surface related echogram.

D Information panes

Several information panes are available to offer detailed information from the echo data. The information panes are opened from the top bar.

E Main menu

The menu system is by default located on the right hand side of the presentation. To open any of the sub-menus, click the icons under the **Main menu** menu. To hide or retrieve the **Main menu** menu, click the **Main menu** button on the top bar.

**F Secondary menus**

The secondary menus are opened and closed by clicking the buttons at the bottom of the **Main** menu.

**G Status bar**

The status bar is located at the bottom of the EK80 presentation.

Echogram views

The EK80 supports several different echogram types, and each of these are shown as separate channel views (transceiver/transducer combinations) in the EK80 presentation. The status bar at the bottom of the EK80 presentation allows you to choose which channels you wish to see. If you wish to see all the channels, the views can be arranged in different visual configurations.

Supported echogram types

The EK80 supports the following echogram types.

- **Surface echogram**

The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

- **Bottom echogram**

The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

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

- **Pelagic echogram**

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

- **Trawl echogram**

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

Status bar

The number of tabs available on the status bar depends on how many channels your EK80 has. There are two tab groups that you can use to select channels and views. This example shows the EK80 with two channels.



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.

Once the views are automatically arranged in the chosen presentation, you can click and drag the borders on the individual views to change the size of the rectangles. Please note that by increasing the size of one view, the others will be smaller.

Note

The Vertical and Horizontal tabs will only be shown if you have two or more transducers.

The Square tab will only be shown if you have three or more transducers.

B Selecting individual echogram channels

Each channel (transceiver/transducer combination) is shown with a dedicated tab. The channel is identified with the name of the transducer in use. In many cases, this name will also include the operational frequency.

Click on a specific transducer tab to see only that channel in the EK80 presentation.

Choosing echogram type

Once a number of echogram views are opened, you can choose which echogram type to see.

To choose echogram type, click in the view to make it "active". Then, 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.

Top bar description

The EK80 top bar is located on the top of the display presentation, and stretches from the far left to the far right side.

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.

And more important, the top bar holds the dedicated buttons to open the various information panes.

It also provides a few buttons related to operating system features.



A Logo and product name

This element identifies the manufacturer and the product.

B Menu button

Click this button to hide or show the menu system.

C Screen capture, Record and Event

These buttons are provided for easy access to recording and annotation functions.

D Information panes

Click any of these buttons to open and close selected information panes.

E Navigational information

These are not buttons, but information read-outs providing current data related to the vessel location, heading and movements. To select which information to see here, use the **Display Options** dialog box on the **Display** menu.

F Messages.

Click this button to open the **Messages** dialog box. This button will flash to indicate that a message is posted. The button colour indicates the severity of the message.

G Operating system functions

- **Help:** Click this button to open the context sensitive on-line help.
- **Minimize :** Click this button to minimize the EK80 presentation.
- **Maximize/Normalize:** Click this button to change the size of the EK80 presentation.
- **Close:** Click this button to close down the EK80.

Note

The information shown on the top bar must not be used for vessel navigation.

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 relevant buttons on the top bar.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.



To *close* the information pane, click the button one more time. You can also click the **Close** button 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. Note that this information pane does not use the same presentation method as the other panes.
- **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.
- **Target Strength Histogram**

The *Target Strength Histogram* information pane shows you a histogram of the echoes detected from single fishes. The histogram presents the strength of the echoes (shown in dB).
- **Target Position**

The *Target Position* information pane shows the position of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The view is "from above". The colours indicate the echo strength.
- **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.
- **Biomass**

The *Biomass* information pane displays an index of the biomass in the current echogram view. The biomass index is the same as the NASC (Nautical area scattering strength) with unit m^2/nmi^2 .

- **Sv(f)**

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency.

- **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 zoom in on a chosen area in the current echogram.

- **Transceiver Power Supply**

The *Transceiver Power Supply* information pane shows you the current supply voltage to the Wide Band Transceiver (WBT).

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Menu system

The menu system is by default located on the right hand side of the EK80 presentation.

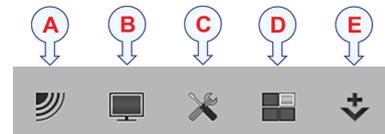
To change operational settings in the EK80, use the tree structure. It offers a main menu, a set of submenus, and several menu buttons. Some of the menu buttons open dialog boxes or sub-menus to present additional parameters.



The **Main** menu offers the settings most frequently used during normal operation.

Below the main menu, a set of dedicated icons are used to open the secondary menus. These are (from left):

- A** The **Operation** menu controls the main operational parameters.
- B** The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation
- C** The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- D** The **Active** menu has its content linked to the current active view. Use it to access special features available for the selected view.
- E** The **Extras** menu is not a menu at all, but a small pane offering key transmission parameters related to the currently active view.



Tip

*You can hide the menu from view if you do not need it. Click the **Menu** button on the top bar to hide the menu, and click one more time to retrieve it. When the menu is hidden, it will automatically reappear on the left or right side of the EK80 presentation if you move your mouse cursor to one of those positions.*



Depth layers in the echogram views

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 echo data collected within a specific depth range in the water column.

By default, a background layer will collect 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 will be 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

This is 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.

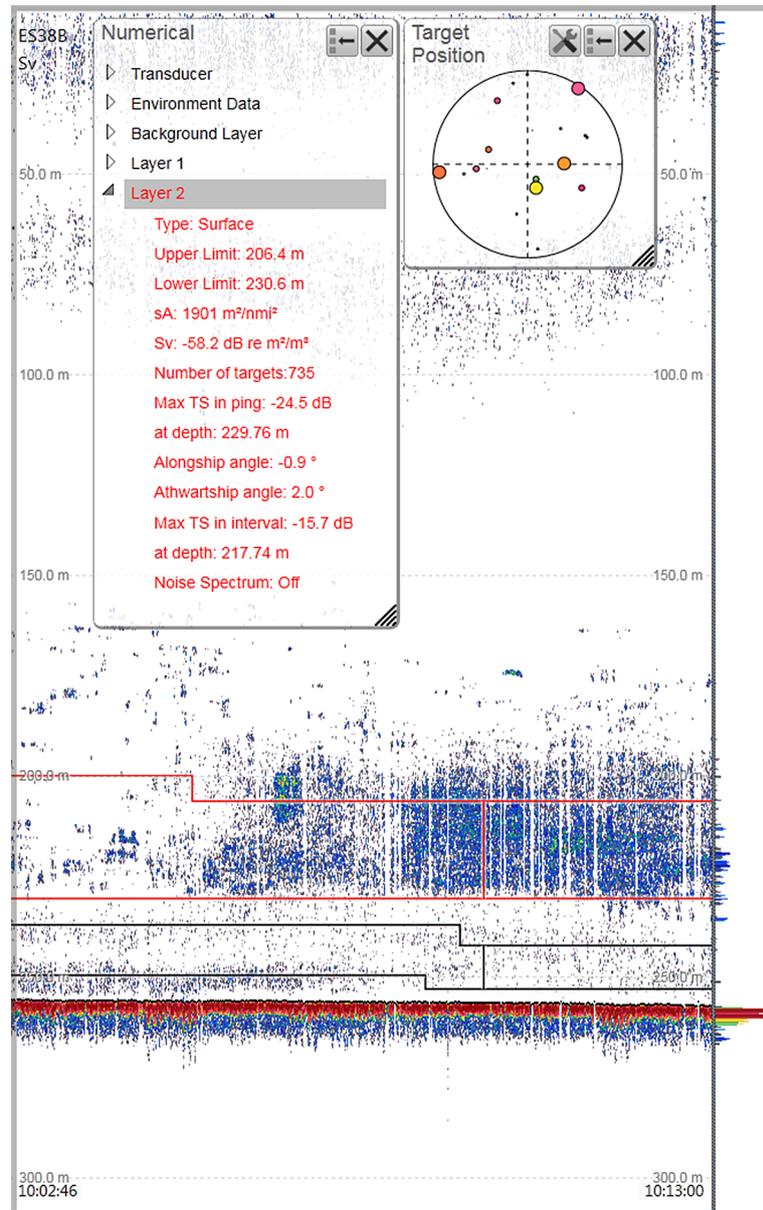
By default, any layer you create will be applied to all echogram views simultaneously.

To work with layers, the following options are available:

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

Note

All information shown in your information panes will reflect the echo data from 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 to identify the start of each calculation interval.

- 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** on the **Active** menu.

Note

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.

Related topics

[New user, page 34](#)

[Numerical information pane, page 272](#)

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

Setting up the EK80 Scientific wide band echo sounder for the first time

Topics

[Setting up summary, page 73](#)

[Installing the EK80 operational software, page 75](#)

[Powering up the EK80 to *Passive* mode, page 76](#)

[Obtaining and installing the software license, page 77](#)

[Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver \(WBT\)., page 79](#)

[Installing one or more transducers, page 80](#)

[Installing transceiver channels, page 82](#)

[Adjusting the screen resolution, page 84](#)

Setting up summary

Before a new EK80 Scientific wide band echo sounder can be put to use, it must be set up for operation. You must install the software, and configure transducer(s) and transceiver(s).

Prerequisites

- The EK80 Scientific wide band echo sounder system units have all been installed according to the instructions in the EK80 *Installation manual*.
- All power and interface cables and connections 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 power up the EK80 when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Procedure

- 1 Do the following preparations:
 - a Power up the Processor Unit.

- b Verify 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: **157.237.15.16** (*Example, any IP address can be used*)
Subnet mask: **255.255.255.0**
- 2 Install the EK80 operational software.
 - 3 Power up the transceiver(s).
 - 4 Verify 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 a high quality Ethernet cable is used. You must use CAT-5E STP (Shielded Twisted Pair) quality or better. Using cables with lower bandwidth capacity will reduce the EK80 performance.

- 5 Start the EK80.
- 6 Click **Setup**→**Installation**→**Software License** to insert the license string(s).
- 7 Click **Setup**→**Installation**→**Transducer** to add the correct transducer(s) from the list.
For each transducer, type the serial number (found on the transducer body).
- 8 Click **Setup**→**Installation**→**Transceiver** to connect the Processor Unit to the transceiver(s).
The available transceiver(s) should be listed. Check transceiver serial number according to correct frequency. For each transceiver, choose the correct transducer.
If no transceivers are listed, click **Browse** button, and select correct network adapter IP address under **Local IP address**.
- 9 Set up the interfaces to peripheral navigation sensors.
These procedures are described in the EK80 *Installation manual*.
- 10 Click **Setup**→**Environment** to select correct water temperature and salinity.
If possible, average values for the water column must be used.
- 11 Start normal operation.
 - a Set **Operation** to *Normal*.
 - b Click **Operation**→**Normal Operation** to set the transmit parameters.
 - c Set **Ping Mode** to *Interval*, and choose a suitable ping rate.

- d Set up the raw data recording parameters.
- e Start and stop raw data recording by means of the **Record RAW** button.

Note

To obtain quantitative data, the EK80 must be calibrated.

Installing the EK80 operational software

If your EK80 Scientific wide band 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 EK80 operational 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.

Note

You need administrative rights on the Processor Unit to install the EK80 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

If you are using one or more Wide Band Transceiver (WBT), you will need valid software licences to operate the EK80. You must install one license for each transceiver after the software installation.

Procedure

- 1 Power up the Processor Unit (computer), and allow the operating system to start.
- 2 Verify that you have administrative rights on the Processor Unit.
You will need this to install the EK80 software.
- 3 Insert the EK80 software media.
- 4 Use a file manager application on the computer to access the software files.
- 5 Double-click on the `Setup.exe` file to start the installation.

- 6 Allow the installation wizard to run. Follow the instructions provided.
We recommend that you install the EK80 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 installation has been completed, double-click the EK80 icon on the desktop to start the program.
- 8 Depending on your operating system parameters, certain dialog boxes may open.
 - a Observe that Windows 7 Firewall may open a dialog box requesting information about the network. Select **Public**, and click **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 of course permit this.

Further requirements

Observe the dedicated procedures for obtaining and installing the software licences.

Related topics

[New installation, page 33](#)

[New portable system, page 35](#)

Powering up the EK80 to *Passive* mode

In order to use the EK80, you must first power it up. 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, and all system cables and connectors have been checked and tested.

It is also assumed that the EK80 software has been installed.

Context

The EK80 software is not automatically started when the Processor Unit is powered up. Once the operating system has started, you must click the icon on the desktop.

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

Caution

You must never power up the EK80 when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Procedure

- 1 Verify that the EK80 transceiver(s) are switched on.
The Wide Band Transceiver (WBT) power supply is fitted with an on/off switch.
- 2 Power up the display(s).
If required, refer to the instructions provided by the display manufacturer.
- 3 Power up the Processor Unit.
If required, refer to the instructions provided by the computer manufacturer.
Wait for the operating system to start up.
- 4 Double-click the EK80 icon on the Processor Unit desktop to start the program.
Wait while the EK80 program starts.
- 5 Choose 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.

Obtaining and installing the software license

If your EK80 shall operate with a Wide Band Transceiver (WBT), you will need a valid 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 Wide Band Transceiver (WBT).

Prerequisites

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

Context**Note**

This procedure is only valid if your EK80 shall operate with a Wide Band Transceiver (WBT).

In order to obtain a software license for your EK80, you must contact a Simrad dealers or distributor. You can also use the request form on <http://www.simrad.com/support>, or contact our support department directly.

The software license is 32 character hexadecimal string built from the transceiver's serial number. It defines several key parameters that controls the functionality and behaviour

of the transceiver(s) you use. The software license is not linked to the physical Processor Unit. You can therefore easily move the EK80 software from one computer to another, just remember to take a copy of the license string.

Note

If you have purchased a complete EK80 system from Kongsberg Maritime with transducer(s) and a Processor Unit, the software license has already been installed.

Once you receive your software license string(s), do not lose them.

Procedure

- 1 Obtain the software license.
 - a Check your transceiver(s), and write down the serial number(s).
 - b For each transceiver, write down how many transducers you have connected.
 - c For each transducer, write down:
 - The center frequency
 - The Q-value
 - The maximum nominal power rating for the transducer

- 2 Send the necessary information to one of Simrad's dealers or distributors.

You can also use the request form on <http://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 EK80 software.

- 3 Observe the **Main** menu.

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

- 4 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 5 On the **Setup** menu, click **Installation**.



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

- 6 On the left side of the **Installation** dialog box, click **Software License**.

Observe that the **Software License** page opens.

- 7 Click **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, click the **Keyboard** button to open an on-screen keyboard.

Tip

*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.*

- 8 Click **OK** to save the license string and close the **Type License String** dialog box.
- 9 Verify that the license string is placed in the **Currently active licenses** list.
If necessary, click the arrow button [**>**] to move it from the list of inactive license string.
- 10 Click **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

[New installation, page 33](#)

[New portable system, page 35](#)

Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver (WBT).

The communication between the Processor Unit and the transceiver(s) is made using a high speed Ethernet cable. If more than one transceiver is used, an Ethernet switch is added. In order to communicate, you recommend that 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® 7 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 an other computer, or replace the network adapter in your Processor Unit, you will only need to do this once.

Procedure

- 1 On the Processor Unit, stop the EK80 program.
- 2 Open the **Network and Sharing Center** dialog box.
 - a In the bottom left corner, click **Start**.
 - b On the right hand side of the menu, click **Control Panel**.

- c Select **Network and Sharing Center**.
(If the Control Panel is shown with categories, select **View network status and tasks**.)
 - d On the left hand menu, select **Change adapter settings**.
 - e Click once on your network adapter to select it, then left-click and select **Properties** on the short-cut menu.
 - f On the list of connections, click **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.
- 3 Select **Use the following IP address**, and type the IP address and network mask.
IP Address: **157.237.15.16** (*Example, any IP address can be used*)
Subnet mask: **255.255.255.0**
- You can leave **Subnet mask** blank and click **OK**. When you see an error message saying that the message subnet mask is missing, click **OK** again. A subnet mask will then automatically be generated.
- 4 Click **OK** to save the settings, then close all the dialog boxes.

Related topics

[New installation, page 33](#)

[New portable system, page 35](#)

Installing one or more transducers

The transducers you wish to use with your EK80 Scientific wide band echo sounder 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.

Prerequisites

It is assumed that the EK80 software has been installed, and that all relevant license strings have been applied.

Context

Transducers are installed using the **Transducer** page in the **Installation** dialog box.

The list of transducers is generated from a system file on your Processor Unit. It contains all transducers compatible with the Wide Band Transceiver (WBT) as well as key technical information about each transducer.

Procedure

- 1 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 2 On the **Setup** menu, click **Installation**.



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

- 3 On the left side of the **Installation** dialog box, click **Transducer** to open the page.
- 4 On the **Transducer** page, open the list, select which transducer you wish to install, and then click **Add**.

Observe that the **Add Transducer** dialog box opens.

- 5 Insert the transducer's serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 Scientific wide band echo sounder is calibrated.

Tip

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*

- 6 Type the name that you wish to use.

This is only for easy recognition.

The name you select will only be used to identify the transducer in other dialog boxes. It will not be reflected in raw or processed data that you export.

- 7 Click **OK** to close the **Add Transducer** dialog box.
- 8 Repeat these steps for every transducer you wish to install.

Result

Once a transducer has been defined, it will be listed in the collapsed menu on the left side of the **Installation** dialog box. To see the relevant transducer information, click on the menu entry. The parameters collected by the **Add Transducer** dialog box are then shown.

This page contains a Remove button that allows you to remove the transducer from the EK80 configuration.

Related topics

[New installation, page 33](#)

[New portable system, page 35](#)

Installing transceiver channels

In order to use the EK80 the Processor Unit must be connected to one or more transceivers, and each of these must in turn be connected to one or more transducers. This transceiver/transducer-combination is referred to as a "channel". Each channel must be installed before it can be put to use.

Prerequisites

This procedure assumes that:

- The EK80 installation is complete with all cables connected.
- The transceiver has been powered up.
- The software license for each transceiver has been installed and activated.
- The Ethernet adapter in the Processor Unit has been set up with a unique IP address.
- All relevant transducers have been installed on the **Transducer** page in the **Installation** dialog box.

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 phrase frequency channel is used to identify the combination of a transceiver, transducers and the frequencies offered.

The frequency channel list on the top of the **Transceiver Installation** page provides you with an overview of the frequency channels currently available.

If you have many transceivers connected you can change the size of the dialog box, or you can use the two arrows on the right hand side of the list to scroll up and down.

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

Procedure

- 1 Observe the **Main** menu.

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

- 2 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 Install the frequency channels(s).
- a Observe that the transceiver(s) you have connected to the Processor Unit are shown at the top of the page.

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

If no transceivers are listed, click **Browse** in the **Transceiver Browsing** field, and open the **Local IP Address** field to select the correct address for the Ethernet adapter you are using. This will make the EK80 search the network for available transceivers. If you still have no transceivers listed, check that each transceiver has been powered up, and that the Ethernet communication between the units is operational. Also, if you are using an Ethernet switch, verify that it works.

- b For each channel, use the drop-down list to choose transducer.

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

Note _____

This is a critical task. You must ensure that the correct transducer is selected.

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

- 5 Click **OK** to save the chosen settings and close the dialog box.

Result

When all transceiver channels have been installed, you can go to the **Operation** menu and set **Operation** to *Normal*.

Caution _____

You must never set the EK80 into normal operation when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Related topics

[New installation, page 33](#)

[New portable system, page 35](#)

Adjusting the screen resolution

If you purchase the Simrad EK80 Scientific wide band echo sounder with a "Enix" Processor Unit, you will see that the default screen resolution on the computer has been set to 1280 x 1024 pixels. We recommend that you use a higher resolution than this.

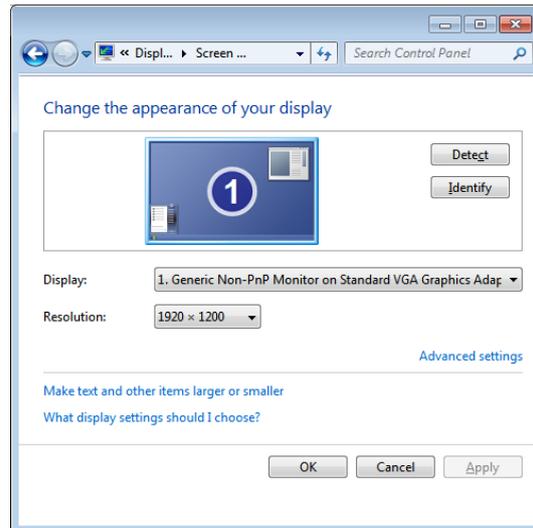
Prerequisites

This procedure is made for the Microsoft® Windows® 7 operating system. It is assumed that you are familiar with this operating system.

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 length of your top bar will also be extended, and free space for icons and navigational information.

As long as you do not change the Processor Unit to an other computer, replace the graphic adapter in your Processor Unit or the physical display, you will only need to do this once.



Procedure

- 1 On the Processor Unit, stop the EK80 program.
- 2 In the bottom left corner of your computer desktop, click the **Start** button.
- 3 On the right side of the **Start** menu, click **Control Panel**.
- 4 Observe that the **Control Panel** opens.
- 5 In the **Control Panel** dialog box, under **Appearance and Personalization**, click **Adjust screen resolution**.
- 6 Change the display settings:
 - a Verify that the correct display is shown.
 - b Change the resolution to maximum permitted resolution for your display.
 - c Click **OK**.
 - d Observe that the screen resolution changes.
 - e Click **Keep changes** in the acknowledge dialog box that appears.
- 7 Click the [X] in the top right corner to close the **Control Panel**.

Related topics[New installation, page 33](#)[New portable system, page 35](#)

Online help description

The EK80 is fitted with a comprehensive context sensitive on-line help system.

The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Note

Due to limitations defined by Microsoft®, CHM files will not open from websites and servers.

To open the help system, click the **Help** button in any dialog box. This will provide instantaneous information about the relevant dialog box with links to related procedures and topics.

Navigation in the on-line help file is made by means of the menu system on the left side, as well as the interactive links in the document.

Tip

*To open the on-line help on its start page, click the **Help** button on the top bar.*



The on-line help may not be available in the language you have chosen for the user interface. By default, the English on-line help will then be used.

Assembling a portable system

Topics

[System diagram for a portable EK80 system, page 86](#)

[Assembling a portable system, page 87](#)

[Battery power cable, page 88](#)

[GPT Transducer plug connections, page 89](#)

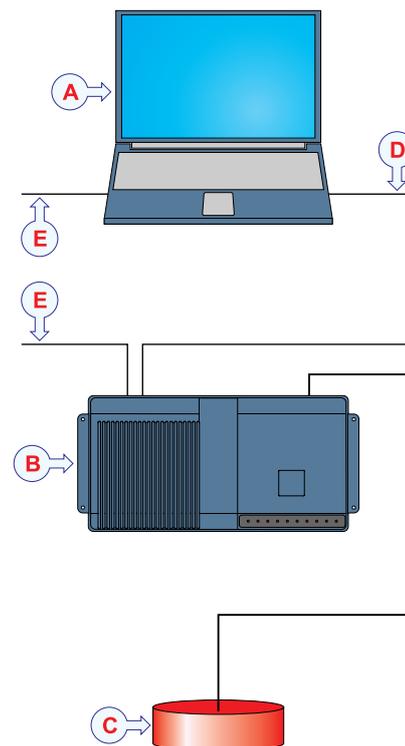
[GPT Transducer plug, page 89](#)

System diagram for a portable EK80 system

The system diagram identifies the main components of a portable EK80 system, as well as the connections between the units.

The portable EK80 Scientific wide band echo sounder system consists of one transducer, one Wide Band Transceiver (WBT) and one computer. In this manual, the computer is referred to as the Processor Unit.

- A** Processor Unit
- B** Wide Band Transceiver (WBT)
- C** Transducer
- D** Ethernet cable between the Processor Unit and the Wide Band Transceiver (WBT)
- E** Cable to a suitable battery



Related topics

[New portable system, page 35](#)

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 survey requirements.

Prerequisites

Assembling a portable EK80 system does not require any special skills or tools. We will however suggest that initial unpacking and assembly take place in a workshop.

In many cases, the Processor Unit (computer) is not a part of the EK80 delivery. A suitable computer must be available.

We also suggest that you use a protective device that prevents the battery from complete discharging.

Procedure

- 1 Unpack each item from its transport box.

Tip

Consider keeping the boxes for future use.

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

If you believe that parts are missing, contact immediately the persons(s) concerned to have the necessary actions taken. This may be the Kongsberg Maritime support organization.

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

If you find damage, such as dents, scratches or loose parts, contact immediately the persons(s) concerned to have the necessary actions taken.

- 4 Place the Processor Unit and the Wide Band Transceiver (WBT) on a suitable workbench for initial connecting up.

- 5 Place the transducer in a large bucket or tank of water.

Caution

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

- 6 Connect the Processor Unit to the Wide Band Transceiver (WBT) using an Ethernet cable.

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. Using cables with lower bandwidth capacity will reduce the EK80 performance.

- 7 Connect the transducer cable to the socket on the rear side of the Wide Band Transceiver (WBT).
- 8 Connect the Processor Unit and the Wide Band Transceiver (WBT) to a suitable power source.

A suitable power source may for example be a +12 Vdc car battery. We suggest that also use a protective device that prevents the battery from complete discharging.

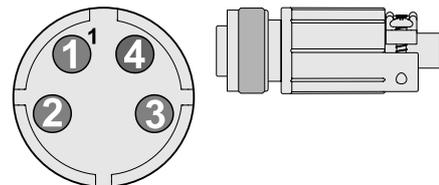
Further requirements

You can now power up the Processor Unit, install the software and the license(s), and set up the EK80 system for normal operation.

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 Wide Band Transceiver (WBT).



The socket is made to fit a Conxall 4-pin **Mini-Con-X®** shielded plug. One spare plug is included with the EK80 delivery, you can use this if you wish to power the Wide Band Transceiver (WBT) from a battery.

The plug can also be ordered from the manufacturer (<http://www.conxall.com>), or purchased from Kongsberg Maritime using order number **390616**.

Pin configuration

Pin	1	2	3	4
Use	+12 Vdc	0 Vdc	0 Vdc	+12 Vdc

Minimum cable requirements

- **Conductors:** 2 x 1.5 mm²
- **Screen:** None

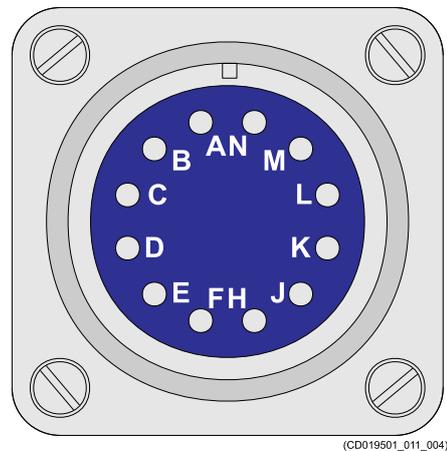
- **Voltage:** 60 V
- **Maximum outer diameter:** N/A

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



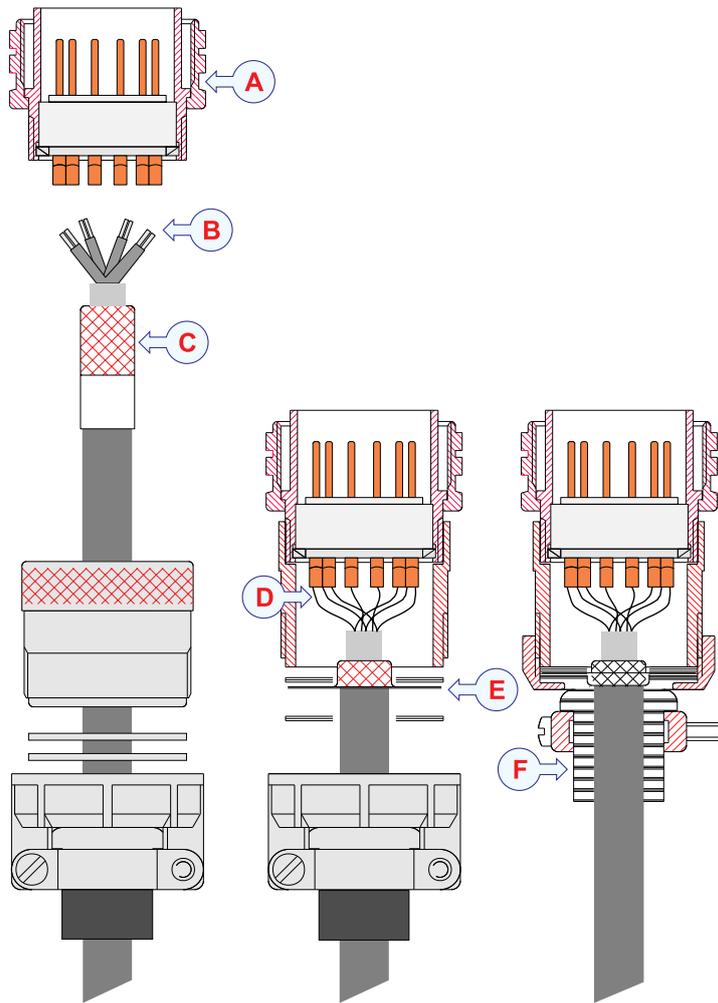
If you need more information about the transducer connections, refer to the documentation provided with the transducer, or to the EK80 *Installation manual*.

GPT Transducer plug

The transducer plug on the General Purpose Transceiver (GPT) and some versions of the Wide Band Transceiver (WBT) allows you to connect one or more single and split beam transducers to the transceiver.

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.



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Operational procedures

Topics

[Power on/off procedures, page 92](#)

[Choosing operational mode and key transmit parameters, page 95](#)

[Controlling the gain and range settings, page 105](#)

[Saving and recalling raw data, page 111](#)

[Saving and exporting processed data, page 117](#)

[Saving and recalling image data, page 122](#)

[Setting up the echogram presentation, page 125](#)

[Working with depth layers, page 141](#)

[Defining settings related to user preferences and individual customizing, page 148](#)

[Saving, retrieving and handling user settings, page 154](#)

[Adjusting the transceiver parameters, page 158](#)

[Interfacing peripheral equipment, page 164](#)

[System setup and software installation procedures, page 183](#)

[Maintaining the EK80, page 197](#)

Power on/off procedures

Topics

[Powering up the EK80, page 92](#)

[Powering down the EK80, page 94](#)

Powering up the EK80

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

Prerequisites

This procedure assumes that you have connected one or more transceivers to the EK80 Processor Unit.

Context

The EK80 software is not automatically started when the Processor Unit is powered up. Once the operating system has started, you must click the icon on the desktop.

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

Caution

You must never power up the EK80 when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Procedure

- 1 Verify that the EK80 transceiver(s) are switched on.
The Wide Band Transceiver (WBT) power supply is fitted with an on/off switch.
- 2 Power up the display(s).
If required, refer to the instructions provided by the display manufacturer.
- 3 Power up the Processor Unit.
If required, refer to the instructions provided by the computer manufacturer.
Wait for the operating system to start up.
- 4 Double-click the EK80 icon on the Processor Unit desktop to start the program.
Wait while the EK80 program starts.

- 5 Choose 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.
- 7 For normal operation, select *Normal* mode using the **Operation** button on the **Operation** menu.



- 8 Set **Ping** to *On* to activate "pinging".

When the EK80 program has started, the icon for the **Operation** menu will flash to remind you that "pinging" is disabled. This is for safety reasons. You must manually start "pinging" by means of the **Ping** button on the **Operation** menu.



- 9 Click **Ping Mode**, and set it to *Interval*.
- 10 Click [+] or [-] on **Ping Interval** to select a suitable fixed time between each "ping".



- 11 Observe that the EK80 starts.

Result

The EK80 starts up using the same operational parameters as the last time you used it. If these parameters are acceptable, continue operation. If you wish to alter basic operational parameters, see the relevant procedures.

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 meters 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

- [Powering down the EK80, page 94](#)
- [User Settings dialog box, page 324](#)
- [Operation function, page 333](#)
- [Ping function, page 338](#)
- [Ping Mode function, page 340](#)

Powering down the EK80

You must NEVER switch off the EK80 by means of the on/off switch on the Processor Unit. You must ALWAYS exit the EK80 program by clicking the **Exit** button on the top bar.

Context

When you do not use the EK80, switch 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). Use the on/off switch on the power supply, or disconnect the power cable.

Procedure

- 1 Click the **Exit** button on the top bar.

Observe that the EK80 program closes down.

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



- 3 Switch off the display(s).

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

- 4 Switch off the transceiver(s).

The transceiver is not provided with an on/off switch.

Unless a dedicated solution has been provided during the installation to facilitate power on/off, you can leave the transceiver(s) on. However, if you know that the EK80 is not to be used for a longer period of time, disconnect the power to the transceiver(s).

Related topics

- [User Settings dialog box, page 324](#)
- [Operation function, page 333](#)
- [Ping function, page 338](#)
- [Ping Mode function, page 340](#)
- [Powering up the EK80, page 92](#)

Choosing operational mode and key transmit parameters

The EK80 offers several operational modes, and you are also permitted to change key parameters related to the transmissions ('pings').

Topics

[Selecting *Normal* operational mode, page 95](#)

[Selecting *Inactive* operational mode, page 96](#)

[Selecting *Replay* operational mode, page 97](#)

[Defining the transmission modes, page 99](#)

[Transmitting single pings, page 101](#)

[Transmitting with fixed time intervals, page 101](#)

[Verifying or changing the environmental parameters, page 102](#)

[Opening the context sensitive on-line help, page 103](#)

Selecting *Normal* operational mode

In order to start transmitting ("pinging") you must set the EK80 to *Normal* operational mode.

Context

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

WARNING

You must never start "pinging" when your vessel is in dry dock. Transmitting in air will damage the transducer beyond repair.

Once started, the EK80 transmissions are controlled by the **Ping Mode** and **Ping Interval** functions, as well as the settings in the **Normal Operation** dialog box.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- Click **Operation**, and set it to *Normal*.



The system is now ready for transmission.

- Click **Ping**, and set it to *On*.



- Click **Ping Mode**, and set it to *Interval*.
- Click [+] or [-] on **Ping Interval** to select a suitable fixed time between each "ping".



Result

The EK80 is now transmitting acoustic pulses 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 meters 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

[Operation function, page 333](#)

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

Selecting *Inactive* operational mode

The *Inactive* mode disables the EK80. Neither transmission nor reception takes place. The current presentation is removed from the screen.

Context

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

Note

*Note that Inactive operational 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.*

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Operation**, and set it to *Inactive*.

**Result**

The EK80 will stop both transmission and reception.

Related topics

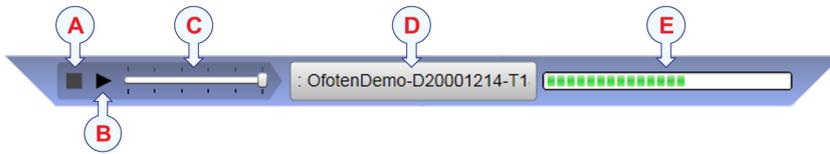
[Operation function, page 333](#)

Selecting *Replay* operational mode

The *Replay* operational mode allows you to play back previously recorded raw data. The EK80 is not operational in *Replay* mode; it is neither transmitting nor receiving.

Context

All playback is controlled by the replay bar.



A Stop

Click this button to stop the playback.

Note that the replay bar will not be removed from the presentation until you select another operational mode.

B Play/Pause

Click this button to start the playback, or to pause it.

C Replay speed

Click this slider and move it sideways to adjust the replay speed.

D Select playback file

This button shows which file you are currently playing. Click the button to open the **Replay File** dialog box.

E Progress

This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the green indicators will start from left every time the start of the file appears.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Operation**, and set it to *Replay*.



The replay bar is automatically opened once you select *Replay* mode. The replay bar is positioned directly below the top bar at the top of the EK80 presentation.

- 3 Start the replay by clicking the **Start** button on the replay bar.
- 4 To stop the replay, choose any other operational mode.

Further requirements

If you need to select which files to replay, click **Replay File** on the sub-menu under the **Operation** button, or click the large button in the middle of the replay bar.

Related topics

[Operation function, page 333](#)

[Replay File dialog box, page 451](#)

Defining the 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 an interval.

Context

Three buttons on the **Operation** menu are used to control the transmission behaviour.

- **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 Mode**

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Interval*, and set the **Ping Interval** according to the survey requirements.

- **Ping Interval**

The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function will then permit you to choose the time (in milliseconds) between each transmission ("ping").

Note

These three functions are only available when the EK80 operates in Normal mode.

Note

*For scientific operations, we recommend that you use Interval mode, and set the **Ping Interval** value according to the survey requirements.*

Procedure

- 1 Observe the **Main** menu.

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

- 2 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 3 Click **Ping**, and set it to *On*.



- The left icon (rectangle) is *Off*. Click this to stop pinging.

- The right icon is *On*. It is also used to initiate single pings when *Single Ping* mode is selected in the **Ping Mode** function.
- If you click the middle of the button, a submenu will open that allows you to select *On* or *Off*.

4 Click **Ping Mode**, and set it to *Maximum*.



This will make the EK80 ping with maximum speed. The time between each ping is automatically determined by a number of parameters, including the current depth, the pulse duration and the chosen range. The processing speed of the computer and the time required to save data are also factors that can affect the ping rate.

5 To define a ping interval:

- Click **Ping Mode**, and set it to *Interval*.
- Click **Ping Interval**, and select the time (in milliseconds) between each ping.

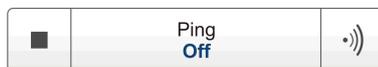


Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

6 To transmit single pings:

- Click **Ping Mode**, and set it to *Single Ping*.
- To transmit a single ping, click once on the right hand icon in the **Ping** button.



Related topics

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

Transmitting single pings

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

Context

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Maximum*. This will allow the EK80 to transmit continuously and as often as possible.

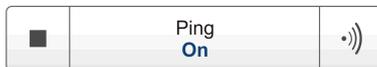


Note

*For scientific operations, we recommend that you use Interval mode, and set the **Ping Interval** value according to the survey requirements.*

Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 2 Click **Ping Mode**, and set it to *Single Step*.
- 3 Click the "ping" symbol on the right side of the **Ping** button to transmit one single "ping".



Related topics

[Ping Mode function, page 340](#)

Transmitting with fixed time intervals

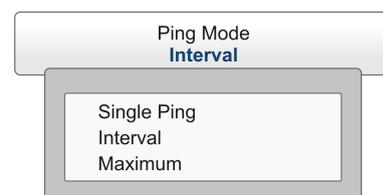
You can set up the EK80 to transmit a "ping" at fixed time interval.

Context

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Maximum*. This will allow the EK80 to transmit continuously and as often as possible.

If you choose *Single Ping*, you can transmit single pings by clicking the ping symbol on the **Ping** button.

If you choose *Interval*, you must define the interval using the **Ping Interval** function.

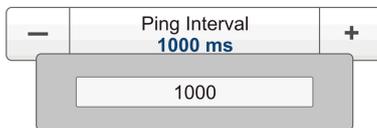


Note

*For scientific operations, we recommend that you use Interval mode, and set the **Ping Interval** value according to the survey requirements.*

Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 2 Click **Ping Mode**, and set it to *Interval*.
- 3 Click **Ping Interval** to open it, and type the interval time in milliseconds.



Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

Related topics

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

Verifying or changing 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 the various parameters are not known to you, use the default sound speed value of 1494 m/s. This is a typical mean value.

Procedure

- 1 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 2 Click **Environment**.



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

- 3 Set up and/or verify the environmental parameters.
 - a Specify if you work in fresh or salt water.
 - b Specify the parameters for temperature, salinity, acidity, depth and latitude.
 - c Specify the sound speed.

Tip

*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.*

- 4 To study the resulting absorption curve, observe the field at the bottom of the dialog box.

Tip

To increase the physical size of the curve, simply increase the size of the dialog box.

- 5 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Environment dialog box, page 377](#)

Opening the context sensitive on-line help

The EK80 is provided with an extensive context sensitive on-line help system. All information of the EK80 *Reference manual* is also provided in the on-line help.

Context

The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Note

Due to limitations defined by Microsoft®, CHM files will not open from websites and servers.

To open the help system, click the **Help** button in any dialog box. This will provide instantaneous information about the relevant dialog box with links to related procedures and topics.

Navigation in the on-line help file is made by means of the menu system on the left side, as well as the interactive links in the document.

Note

The on-line help may not be available in the language you have chosen for the user interface. By default, the English on-line help will then be used.

Procedure

- 1 Click the **Help** button on the top bar.

This will open the on-line help file on its start page. Observe the menu on the left side, or use the search functionality.



- 2 Click the **Help** button in any dialog box.

The description of the related dialog box will appear in the help window.

Controlling the gain and range settings

Range and signal gain are among the most basic parameters for data collection. The gain setting controls how "powerful" the echoes are shown in the echograms, while the range settings are used to define the start depth and the vertical range covered by the EK80.

Topics

[Adjusting the echo sensitivity, page 105](#)

[Adjusting the TVG \(Time Varied Gain\), page 106](#)

[Choosing Range and Start Range in a surface echogram, page 107](#)

[Choosing Range and Start Range in a bottom echogram, page 109](#)

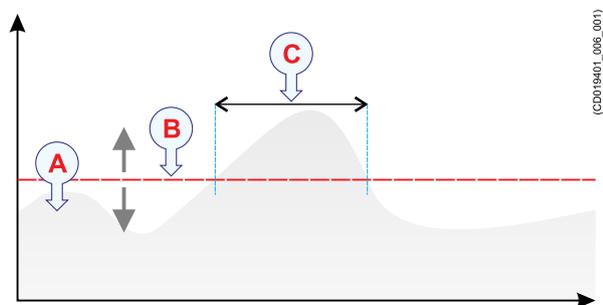
Adjusting the echo sensitivity

On the EK80 you do not change the actual gain in the receiver, but the minimum level of the colour scale. When the 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.

By default, the Minimum Level setting applies only to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box. If you wish to adjust the Minimum Level on all similar echograms in your view, click to select **Apply to all**.



The echo strength (A) will vary with time. The Minimum Level (B) may be adjusted up or down. Reducing the level will increase the sensitivity. Only echoes over the Minimum Level will be shown in the echogram (C).

Procedure

- 1 Observe the **Minimum Level** button on the **Main** menu.



2 **Method 1**

- a Click [+] or [-] to choose the level.

3 **Method 2**

- a Click the middle of the **Minimum Level** button, hold the mouse button depressed.
- b Drag the cursor sideways to increase or decrease the level.

4 **Method 3**

- a Click the middle of the **Minimum Level** button to open the submenu.
- b Type the requested level.

Note

You can only use this method if you have computer keyboard connected to your Processor Unit.

Related topics

[Gain function, page 329](#)

Adjusting the TVG (Time Varied Gain)

The Time Varied Gain (TVG) can be defined by means of the **TVG** function on the **Active** menu, or in the **Echogram** dialog box.

Context

The TVG (Time Variable Gain) functionality compensates for the loss in the acoustic energy due to the geometric spread and the absorption of the sound as it travels through the water.

- 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).
- Depending on the salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the range 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*.

Basically, the TVG function compensation is designed to counteract these natural phenomena, and this is done in the EK80 using digital signal processing. The TVG will thus equalize the echo presentation as a function of range to make targets with the same strength appear with the same intensity independent of their physical distance from the EK80 transducer.

The TVG compensation is expressed as a logarithmic curve. The TVG curve can be selected with several different slopes, each having different gain regulations. The curves

are identified as **X log TVG**, where the coefficient **X** is an integer. Typical values for **X** are 10 to 40.

The options are:

- **Pr (No TVG)**
TVG compensation is not implemented.
- **Sv (20 log R)**
Volume backscattering strength.
- **Sp (40 log R)**
Point backscattering strength.

Tip

*The selection made using the **TVG** button is the same as found on the **Type** page in the **Echogram** dialog box.*

Procedure

- 1 Click once in the echogram view that you wish to change.
This will make the view "active". A thick border is placed on the selected view to visualize this.
- 2 Click the **Active** icon.
This icon is located under the **Main** menu. It is used to open the **Active** menu.
- 3 Observe the **TVG** function on the **Active** menu.
- 4 Click the middle of the **TVG** button to open the submenu.
- 5 Choose your requested setting for TVG (Time Varied Gain).
- 6 Click **Apply to all** if you wish to use apply the change to all the echogram views.

Related topics

[TVG function, page 418](#)

Choosing Range and Start Range in a surface echogram

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, that is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies this "bottom" depth, while the **Start Range** setting specifies the "top" depth.

In a surface echogram, the **Start Range** value is used to determine from which depth the echogram shall start. This is normally chosen to be a few meters 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 the bottom detection.

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.

Procedure

- 1 Observe the **Main** menu.
Its default location is on the right side of the EK80 presentation.

- 2 On the **Main** menu, click **Start Range** to activate the function.



- 3 Choose a positive value for **Start Range** to place the top of the echogram at the preferred distance under the sea surface.

Use any of the following methods to change the depth range.

- a Click [+] or [-] to adjust the range manually.
- b Click the middle of the button, hold the mouse button depressed, and drag sideways.
- c Click the middle of the button to open it, then type the requested range on the keyboard.

- 4 On the **Main** menu, click **Range** to activate the function.



- 5 Choose a positive value for **Range** to place the bottom of the echogram at the preferred distance over or under the bottom.

Use any of the following methods to change the depth range.

- a Click [+] or [-] to adjust the range manually.
- b Click the middle of the button, hold the mouse button depressed, and drag sideways.
- c Click the middle of the button to open it, then type the requested range on the keyboard.

Related topics

[Range function, page 326](#)

[Start Range function, page 327](#)

Choosing Range and Start Range in a bottom echogram

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, that is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies this "bottom" depth, while the **Start Range** setting specifies the "top" depth.

In a bottom echogram, the **Range** value will be "added" to the **Start Range** value to determine the vertical depth of the echogram. The **Start Range** value must be negative because the echogram shall from a preferred distance over the bottom.

Example

Start Range and Range in bottom related echogram

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

Procedure

- 1 Observe the **Main** menu.
Its default location is on the right side of the EK80 presentation.
- 2 On the **Main** menu, click **Start Range** to activate the function.



- 3 Choose a negative value for **Start Range** to place the start depth at the preferred distance over the bottom.

Use any of the following methods to change the value.

- a Click [+] or [-] to adjust the start range value manually.
 - b Click the middle of the button, hold the mouse button depressed, and drag sideways.
 - c Click the middle of the button to open it, then type the requested start range value on the keyboard.
- 4 On the **Main** menu, click **Range** to activate the function.



- 5 Choose a positive value for **Range** to place the bottom of the echogram at the preferred distance under the bottom.

Use any of the following methods to change the depth range.

- a Click [+] or [-] to adjust the range manually.
- b Click the middle of the button, hold the mouse button depressed, and drag sideways.
- c Click the middle of the button to open it, then type the requested range on the keyboard.

The **Range** value will be added to the negative **Start Range** value. The sum determines the actual distance from the bottom and down to the lower limit of the echogram.

Related topics

[Range function, page 326](#)

[Start Range function, page 327](#)

Saving and recalling raw data

Topics

[Defining the file and folder settings for raw data recording, page 111](#)

[Recording raw data, page 112](#)

[Selecting *Replay* operational mode, page 114](#)

[Choosing which echogram RAW data file\(s\) to replay, page 115](#)

[Accessing the raw data files to delete, move or copy them, page 116](#)

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's hard disk - or on an external data storage device - according to the preferences you have defined.

Context

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

Set up the file and folder parameters before you start the recording.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 On the **Operation** menu, click **Output**.



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

- 3 On the left side, click **File Setup** to open the page.
- 4 On the **File Setup** page, define the relevant file and folder properties.
- 5 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Output dialog box, page 346](#)

[File Setup page, page 348](#)

Recording raw data

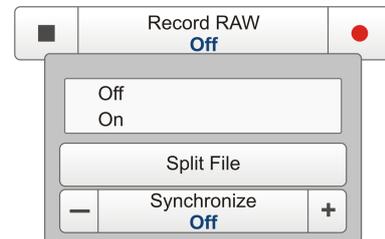
The raw data recording function provided by the EK80 allows you to save echo data on *.raw format to a file on the Processor Unit hard disk, or onto an external disk.

Prerequisites

Before you start raw data recording, make sure that you have defined where to store the data files.

Tip _____

*On the **Operation** menu, click **Output**→**File Setup** to define the recording parameters.*



Context

On the EK80, you can save and recall echo information in the following ways.

- Screen captures
- Raw data
- History file

You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.

Note

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 To start raw data recording, click the **Record RAW** button, and select *On*.



The **Record** button on the top bar will change colour to reflect that recording is active.

Tip

Alternatively, simply click the red circle on the right side of the button to start recording.

*To synchronize simultaneous recording of raw and processed data, open the **Record RAW** button, and set **Synchronize** to *On*. With synchronization activated, you will automatically start and stop recording using only the **Record RAW** button on the **Operation** menu, and the **Record** button on the top bar.*

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

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

- 4 To stop raw data recording, click the **Record RAW** button, and select *Off*.

Tip

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

Related topics

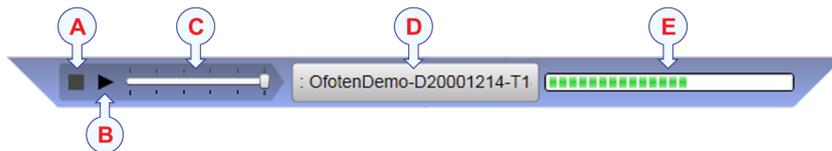
[Record RAW function, page 342](#)

Selecting *Replay* operational mode

The *Replay* operational mode allows you to play back previously recorded raw data. The EK80 is not operational in *Replay* mode; it is neither transmitting nor receiving.

Context

All playback is controlled by the replay bar.



A Stop

Click this button to stop the playback.

Note that the replay bar will not be removed from the presentation until you select another operational mode.

B Play/Pause

Click this button to start the playback, or to pause it.

C Replay speed

Click this slider and move it sideways to adjust the replay speed.

D Select playback file

This button shows which file you are currently playing. Click the button to open the **Replay File** dialog box.

E Progress

This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the green indicators will start from left every time the start of the file appears.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Operation**, and set it to *Replay*.



The replay bar is automatically opened once you select *Replay* mode. The replay bar is positioned directly below the top bar at the top of the EK80 presentation.

- 3 Start the replay by clicking the **Start** button on the replay bar.
- 4 To stop the replay, choose any other operational mode.

Further requirements

If you need to select which files to replay, click **Replay File** on the sub-menu under the **Operation** button, or click the large button in the middle of the replay bar.

Related topics

[Operation function, page 333](#)

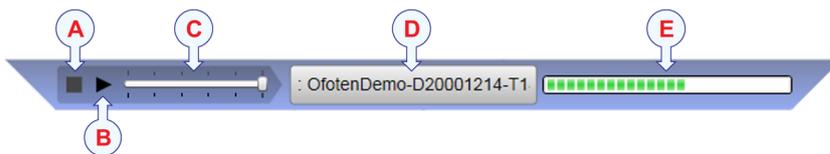
[Replay File dialog box, page 451](#)

Choosing which echogram RAW data file(s) to replay

Every time you record echogram data, the information is stored on the harddisk. These files can be retrieved, and played back on the EK80.

Context

All playback is controlled by the replay bar.



Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Operation** to open it, then click **Replay File**.



Observe that the **Replay File** dialog box opens.

The **Replay File** dialog box contains file(s) to be used for playback. The file names listed have been generated automatically during recording, and each file is identified with the time and date it was made.

- 3 Click **Add** to select new replay file(s).

A standard operating system dialog box is used to locate and select the files you wish to use.

- 4 If you wish to replay the selected files in an "endless" loop, click **Loop**.

- 5 Click **OK** to save the chosen parameters and close the dialog box.

- 6 To start playback, click **Normal** → **Replay**, and use the controllers in the replay bar.

Related topics

[Replay File dialog box, page 451](#)

Accessing the raw data files to delete, move or copy them

The data recording functionality provided by the EK80 allows you to save raw echo data to files. These can be placed on the Processor Unit hard disk, or on another storage device. The files can later be deleted, copied or moved to another storage device.

Prerequisites

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

Procedure

- 1 Observe the **Screen Captures** tab on the status bar at the bottom of the EK80 presentation.



- 2 In the browser, click **Open Image Folder** to open an operating system folder.
- 3 Use the functionality provided by the operating system to navigate to the file folder with the data files.

This is the folder you defined using the **File Setup** parameters in the **Outputs** dialog box.
- 4 Prepare a separate data storage device.

This is typically a large capacity USB memory device or a hard disk. You can also connect the EK80 Processor Unit to a network, and copy the files to a server.
- 5 Use the functionality provided by the operating system to delete the files, or to copy or move them to the separate storage device.
- 6 Close the file manager utility.
- 7 To return to normal operation, click any other tab at the bottom of the EK80 presentation.

Saving and exporting processed data

Topics

[Defining the file and folder settings for processed data recording, page 117](#)

[Recording processed data, page 118](#)

[Accessing the processed data files to delete, move or copy them, page 120](#)

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

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

Set up the file and folder parameters before you start the recording.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 On the **Operation** menu, click **Output**.



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

- 3 On the left side, click **File Setup** to open the page.
- 4 On the **File Setup** page, define the relevant file and folder properties.

- 5 On the left side of the **Output** dialog box, click **Processed Data Output** to open the page.
- 6 Select a file output format from the drop-down list, and click **Add** on the right side. Observe that the **Processed Data Output Configuration** dialog box opens to record the relevant settings for the chosen output format.
- 7 Choose the settings for the chosen output format.

Note _____

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

- 8 Click **OK** to close the **Processed Data Output Configuration** dialog box.
- 9 At the bottom of the **Output** dialog box, click **OK** to save the chosen parameters and close it.

Recording processed data

The processed data recording function provided by the EK80 allows you to save processed data to a file on the Processor Unit hard disk, or onto an external disk. Note that this is only an export format. Processed data file can not be played back on the EK80.

Prerequisites

Before you start recording of processed data, make sure that you have defined where you wish to store the data files.

Tip _____

*On the **Operation** menu, click **Output**→**File Setup** to define the recording parameters.*

Context

The processed data is only an export format, and can not be played back on the EK80. If you wish to save and recall echo information the following methods can be used.

- Screen captures
- Raw data
- History file

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Tip

*You may wish to synchronize the recording of raw and processed data. On the submenu under the **Record RAW** button, set **Synchronize** to **On**. The **Record** button on the top bar will indicate when raw and processed data are recorded simultaneously.*

**Procedure**

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Verify that the **Record Processed** function is available.

If it is unavailable, it is most likely because you have forgotten to specify an output format. Open the **Output** dialog box, and select a format on the **Processed Data Output** page. Remember that not all formats can be saved on a file format.

- 3 To start recording of processed data, click the **Record Processed** button, and select **On**.

**Tip**

Alternatively, simply click the red circle on the right side of the button to start recording.

*To synchronize simultaneous recording of raw and processed data, open the **Record RAW** button, and set **Synchronize** to **On**. With synchronization activated, you will automatically start and stop recording using only the **Record RAW** button on the **Operation** menu.*

- 4 To stop data recording of processed data, click the **Record Processed** button, and select *Off*.

Tip

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

Related topics

[Record Processed function, page 344](#)

Accessing the processed data files to delete, move or copy them

The data recording functionality provided by the EK80 allows you to save processed echo data to files. These can be placed on the Processor Unit hard disk, or on another storage device. The files can later be deleted, copied or moved to another storage device.

Prerequisites

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

Procedure

- 1 Observe the **Screen Captures** tab on the status bar at the bottom of the EK80 presentation.



- 2 In the browser, click **Open Image Folder** to open an operating system folder.
- 3 Use the functionality provided by the operating system to navigate to the file folder with the data files.

This is the folder you defined using the **File Setup** parameters in the **Outputs** dialog box.

- 4 Prepare a separate data storage device.
This is typically a large capacity USB memory device or a hard disk. You can also connect the EK80 Processor Unit to a network, and copy the files to a server.
- 5 Use the functionality provided by the operating system to delete the files, or to copy or move them to the separate storage device.
- 6 Close the file manager utility.

- 7 To return to normal operation, click any other tab at the bottom of the EK80 presentation.

Saving and recalling image data

Topics

[Saving a single echogram image, page 122](#)

[Recalling single echogram images, page 123](#)

[Accessing echogram images to delete, move or copy them, page 124](#)

Saving a single echogram image

You can save a single echogram image by means of the **Screen Capture** button on the top bar.

Context

On the EK80, you can save and recall echo information in the following ways.

- a Bitmap images (containing the full EK80 screen) are saved whenever you click the **Screen Capture** button on the top bar. These images are recalled by means of the **Screen Captures** tab at the bottom of the EK80 presentation.
- b Raw data is recorded using the **Record RAW** function on the **Operation** menu. The raw data files may be played back by placing the EK80 in *Replay* mode.
- c 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". To play back the history file, click the **History** button on the top bar.

Tip

*You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.*

Procedure

- 1 Observe the **Screen Capture** button on the top bar.
- 2 Click the **Screen Capture** button to save the current EK80 presentation.



Result

The screen capture is saved on the hard disk in standard JPG format. The capture includes the entire visible presentation. It includes the current echogram view(s) and the menu.

Further requirements

To recall the screen capture, click the **Screen Captures** tab at the bottom of the EK80 presentation.

Recalling single echogram images

You can save a single echogram image by means of the **Screen Capture** button on the top bar. To recall an image, use the **Screen Captures** tab.

Context

On the EK80, you can save and recall echo information in the following ways.

- a Bitmap images (containing the full EK80 screen) are saved whenever you click the **Screen Capture** button on the top bar. These images are recalled by means of the **Screen Captures** tab at the bottom of the EK80 presentation.
- b Raw data is recorded using the **Record RAW** function on the **Operation** menu. The raw data files may be played back by placing the EK80 in *Replay* mode.
- c 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". To play back the history file, click the **History** button on the top bar.

Tip

*You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.*

Procedure

- 1 Click the **Screen Captures** tab at the bottom of the EK80 presentation.



Observe that the built-in image browser starts. All currently saved screen capture images are shown as miniatures.

- 2 Double-click the image you wish to enlarge.
- 3 Click **Return to Browser** to close the image.
- 4 To return to normal operation, click any other tab at the bottom of the EK80 presentation.

Accessing echogram images to delete, move or copy them

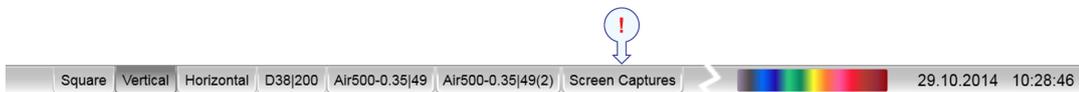
Once the screen capture bitmap images have been saved, you may also wish to delete them, copy them, or move them from the Processor Unit's hard disk to a separate storage device.

Prerequisites

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

Procedure

- 1 Click the **Screen Captures** tab at the bottom of the EK80 presentation.



Observe that the built-in image browser starts. All currently saved screen capture images are shown as miniatures.

- 2 In the browser, click **Open Image Folder** to open an operating system folder.
- 3 Prepare a separate data storage device.
This is typically a large capacity USB memory device or a hard disk. You can also connect the EK80 Processor Unit to a network, and copy the files to a server.
- 4 Use the functionality provided by the operating system to delete the files, or to copy or move them to the separate storage device.
- 5 Close the file manager utility.
- 6 To return to normal operation, click any other tab at the bottom of the EK80 presentation.

Setting up the echogram presentation

The EK80 offers several functions that allow you to set up the echogram presentation – including layout and colours – to match you preferences and/or survey requirements.

Topics

- [Selecting which echogram type to use, page 125](#)
- [Controlling the echogram views from the status bar, page 127](#)
- [Selecting which echograms to see, page 128](#)
- [Changing the size of the echogram views, page 129](#)
- [Defining the transmission modes, page 129](#)
- [Choosing echogram colours, page 131](#)
- [Adjusting the TVG in the Echogram dialog box, page 133](#)
- [Selecting the horizontal scale in the echogram views, page 134](#)
- [Adding scale labels to the echogram views, page 136](#)
- [Adding bottom marker lines to the echograms, page 137](#)
- [Adding vertical ticks to the echograms, page 138](#)
- [Adding annotations to the echograms, page 139](#)

Selecting which echogram type to use

Three different echogram types may be presented by the EK80. For each channel you must choose to use one of them.

Context

The following echogram types are available.

- **Surface echogram**

The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

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

- **Bottom echogram**

The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

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

- **Pelagic echogram**

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

In the pelagic echogram the calculations will disregard any bottom detection. All calculations are thus 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 echogram**

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

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

Procedure

- 1 Click once in the echogram view that you wish to change.

This will make the view "active". A thick border is placed on the selected view to visualize this.

- 2 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 3 Click **Echogram**.



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

- 4 In the **Echogram** dialog box, click the **Echogram** tab.

- 5 Select the echogram type you wish to apply to the chosen view.

- 6 Apply the change(s) you have made.

- a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
- b Click **Apply to all** if you wish to use apply the change to all the echogram views.

7 Click **OK** to save the chosen parameters and close the dialog box.

Further requirements

Set up the **Range** and **Start Range** values you wish to use for the chosen echogram(s).

Related topics

[Echogram page, page 424](#)

Controlling the echogram views from the status bar

The status bar at the bottom of the EK80 allows you to control which echogram views you wish to see, and how these are organized.

Context

The tabs on the status bar allows you to control the echogram presentation as follows:

- **Arrange the echogram channels**

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.

Once the views are automatically arranged in the chosen presentation, you can click and drag the borders on the individual views to change the size of the rectangles. Please note that by increasing the size of one view, the others will be smaller.

- **Select individual echogram channels**

Each channel (transceiver/transducer combination) is shown with a dedicated tab. The channel is identified with the name of the transducer in use. In many cases, this name will also include the operational frequency.

Click on a specific transducer tab to see only that channel in the EK80 presentation.

Note

*The **Vertical** and **Horizontal** tabs will only be shown if you have two or more transducers.*

*The **Square** tab will only be shown if you have three or more transducers.*

Tip

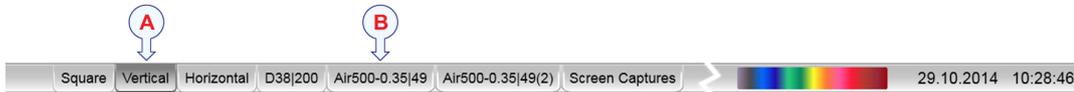
*Keep in mind that you can also use the **Layout** dialog box to arrange the order of the echogram views.*



*This dialog box is opened from the **Display** menu.*

Procedure

- 1 Observe the status bar at the bottom of the EK80 presentation.
- 2 Click the appropriate tab to control the presentation of the echogram views.



- A** Click *Square*, *Vertical* or *Horizontal* to arrange the views accordingly.
- B** Click the name of a transducer to see the relevant echogram. The echograms from the other transducer will then be hidden.

Related topics

[Layout dialog box, page 365](#)

Selecting which echograms to see

Your EK80 may be set up with one or more frequency channels. The **Layout** dialog box allows you to control which channels to see on the echogram presentation.

Context

In a large system with many transceivers and transducers in simultaneous use, it can be useful to hide channels temporarily from view.

When two or more echograms are shown, you can also 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.

Tip

Remember that you can also hide or show echogram channels by clicking the transducer tabs at the bottom of the EK80 presentation.

Procedure

- 1 Click the **Display** icon.
This icon is located under the **Main** menu. It is used to open the **Display** menu.
- 2 Click **Layout**.



- Observe that the **Layout** dialog box opens.
- 3 Observe that all current transducers are listed in the dialog box.
- 4 Click **Visible** to hide or view the echograms from specific transceivers.

- 5 Click the two arrows on the right hand side of the **Layout** dialog box to place the echograms in the preferred vertical order.
- 6 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Layout dialog box, page 365](#)

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 view can be changed individually. The content in a view that changes size will automatically adjust to take full advantage of the space available.

The modifications you make are erased when you click one of the tabs on the status bar.

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 out.
- 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.

Defining the 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 an interval.

Context

Three buttons on the **Operation** menu are used to control the transmission behaviour.

- **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 Mode**

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Interval*, and set the **Ping Interval** according to the survey requirements.

- **Ping Interval**

The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function will then permit you to choose the time (in milliseconds) between each transmission ("ping").

Note

These three functions are only available when the EK80 operates in Normal mode.

Note

*For scientific operations, we recommend that you use Interval mode, and set the **Ping Interval** value according to the survey requirements.*

Procedure

- 1 Observe the **Main** menu.

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

- 2 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 3 Click **Ping**, and set it to *On*.



- The left icon (rectangle) is *Off*. Click this to stop pinging.
- The right icon is *On*. It is also used to initiate single pings when *Single Ping* mode is selected in the **Ping Mode** function.
- If you click the middle of the button, a submenu will open that allows you to select *On* or *Off*.

- 4 Click **Ping Mode**, and set it to *Maximum*.



This will make the EK80 ping with maximum speed. The time between each ping is automatically determined by a number of parameters, including the current depth, the pulse duration and the chosen range. The processing speed of the computer and the time required to save data are also factors that can affect the ping rate.

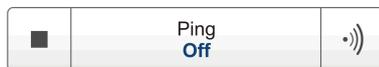
- 5 To define a ping interval:
 - a Click **Ping Mode**, and set it to *Interval*.
 - b Click **Ping Interval**, and select the time (in milliseconds) between each ping.



Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

- 6 To transmit single pings:
 - a Click **Ping Mode**, and set it to *Single Ping*.
 - b To transmit a single ping, click once on the right hand icon in the **Ping** button.



Related topics

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

Choosing echogram colours

Several different colour scales are predefined and available for the presentation of echograms. You can easily choose which colours to use.

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 clicking the **Colour Scale** icon on the top bar.*

The currently selected colour scale is shown at the bottom of the EK80 presentation.

A set of predefined colour scales are available.

12 colours



Sonar colours



Echogram colours



Grayscale



BI500 colours



The **Echogram colours** scale is based on the standard 12-colour scale, but additional colours have been added between these to make smoother colour transitions.

In addition to these options, a special color scale is available for sidescan presentations.

Tip

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



Procedure

- 1 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- 2 Click **Colour Setup**.



Observe that the **Colour Setup** dialog box opens.

- 3 Select the number of colours you wish to use.

Note

If you wish to apply the predefined colour scales you must select 64 colours.

- 4 Select the colour scale you wish to use.

If you are working with sidescan echogram(s), observe that a dedicated colour scale is available.

- 5 Click **Apply** if you wish to preview the choice you have made.

6 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Colour Setup dialog box, page 370](#)

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

The TVG (Time Variable Gain) functionality compensates for the loss in the acoustic energy due to the geometric spread and the absorption of the sound as it travels through the water.

- 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).
- Depending on the salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the range 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*.

Basically, the TVG function compensation is designed to counteract these natural phenomena, and this is done in the EK80 using digital signal processing. The TVG will thus equalize the echo presentation as a function of range to make targets with the same strength appear with the same intensity independent of their physical distance from the EK80 transducer.

The TVG compensation is expressed as a logarithmic curve. The TVG curve can be selected with several different slopes, each having different gain regulations. The curves are identified as **X log TVG**, where the coefficient **X** is an integer. Typical values for **X** are 10 to 40.

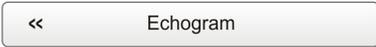
The options are:

- **Pr (No TVG)**
TVG compensation is not implemented.
- **Sv (20 log R)**
Volume backscattering strength.
- **Sp (40 log R)**
Point backscattering strength.

Tip

The selection made in the **Echogram** dialog box can also be made using the **TVG** button on the **Active** menu.

Procedure

- 1 Click once in the echogram view that you wish to change.
This will make the view "active". A thick border is placed on the selected view to visualize this.
- 2 Click the **Active** icon.
This icon is located under the **Main** menu. It is used to open the **Active** menu.
- 3 Click **Echogram**.

Observe that the **Echogram** dialog box opens.
- 4 In the **Echogram** dialog box, click the **Echogram** tab.
- 5 Choose your requested setting for TVG (Time Varied Gain).
- 6 Apply the change(s) you have made.
 - a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
 - b Click **Apply to all** if you wish to use apply the change to all the echogram views.
- 7 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Echogram page, page 424](#)

Selecting the horizontal scale in the echogram views

You can change the horizontal scale of the echogram views on the **Horizontal Axis** page in the **Echogram** dialog box.

Context

The following options are available for the horizontal axis of the echogram views.

- **Distance**

The horizontal scale of the echogram is based on sailed distance. Choose resolution and units with the spin boxes provided.

- **Time**

The horizontal scale of the echogram is based on time. Choose resolution and units with the spin boxes provided.

- **Ping**

The horizontal scale of the echogram is based on the number of pings (transmissions) made. Choose resolution and units with the spin boxes provided. Check the **View Size** box to specify that the number of horizontal pixels shall define the number of displayed horizontal pings (One ping per pixel).

- **Speed**

The horizontal scale of the echogram is based on the relative speed you choose. Choose speed with the ruler provided.

Procedure

- 1 Click once in the echogram view that you wish to change.

This will make the view "active". A thick border is placed on the selected view to visualize this.

- 2 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 3 Click **Echogram**.



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

- 4 In the **Echogram** dialog box, click the **Horizontal Axis** tab.

- 5 Choose the horizontal scale you wish to use.

- 6 Apply the change(s) you have made.

- a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
- b Click **Apply to all** if you wish to use apply the change to all the echogram views.

- 7 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Horizontal Axis page, page 427](#)

Adding scale labels to the echogram views

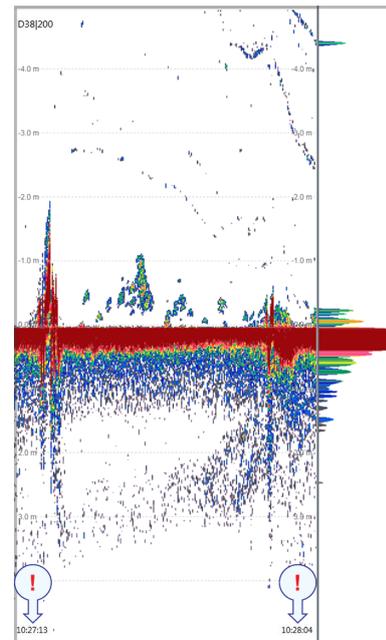
In order to identify the horizontal scale of your echogram views, you can enable scale labels.

Context

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

The following options are available.

- **None:** Both 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).



Procedure

- 1 Click once in the echogram view that you wish to change.

This will make the view "active". A thick border is placed on the selected view to visualize this.

- 2 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 3 Click **Echogram**.



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

- 4 In the **Echogram** dialog box, click the **Horizontal Axis** tab.
- 5 Choose the label you wish to use.
- 6 Apply the change(s) you have made.
 - a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
 - b Click **Apply to all** if you wish to use apply the change to all the echogram views.
- 7 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Horizontal Axis page, page 427](#)

Adding bottom marker lines to the echograms

In order to increase the readability of the echograms, several horizontal markers may be added. These will allow you to improve the visual presentation of the bottom.

Context

The following bottom marker lines are available:

- **Bottom Line**

The 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.

This is an "on/off" switch. Click to enable.

- **Normal**

The bottom line is presented with its "normal" presentation. The bottom line is drawn in the current foreground colour.

- **White Line**

The 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.

Procedure

- 1 Click once in the echogram view that you wish to change.

This will make the view "active". A thick border is placed on the selected view to visualize this.

- 2 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 3 Click **Echogram**.



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

- 4 In the **Echogram** dialog box, click the **Lines** tab.

- 5 Select the bottom marker lines that you wish to use in the echogram.

- 6 Apply the change(s) you have made.
 - a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
 - b Click **Apply to all** if you wish to use apply the change to all the echogram views.
- 7 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Lines page, page 421](#)

Adding vertical ticks to the echograms

Vertical marker lines can be added to the top of the echogram view to identify elapsed time or sailed distance.

Context

The following vertical markers can be added.

- **None**
No vertical markers are shown.
- **Time**
This option places a short vertical line in the upper part of the echogram once every specified number of minutes.
- **Distance**
This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of 1/10 nautical miles.

Procedure

- 1 Click once in the echogram view that you wish to change.
This will make the view "active". A thick border is placed on the selected view to visualize this.
- 2 Click the **Active** icon.
This icon is located under the **Main** menu. It is used to open the **Active** menu.
- 3 Click **Echogram**.



- Observe that the **Echogram** dialog box opens.
- 4 In the **Echogram** dialog box, click the **Lines** tab.
 - 5 Click to enable the vertical ticks.

- 6 Apply the change(s) you have made.
 - a Click **Apply** if you wish to use apply the change only to the currently active echogram view.
 - b Click **Apply to all** if you wish to use apply the change to all the echogram views.
- 7 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Lines page, page 421](#)

Adding annotations to the echograms

If you need to add comments to the echograms, you can use the annotations functionality. You must then first define the type of annotations you wish to use, and then enable the function in the **Echogram** dialog box.

Context

Several different annotation types may be added to the echogram. The annotations defined are stored with the raw data as annotation datagrams. They are displayed on the echogram if this feature is enabled in the **Echogram** dialog box.

Note

Annotations can only be added to the echogram while in Normal operational mode.

Procedure

- 1 On the **Setup** menu, click **Installation**.



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

- 2 On the left side in the **Installation** dialog box, click **Annotations**.
Observe that the **Annotations** page opens on the right hand side.
- 3 Specify the annotations you wish to use, and how you wish to trigger them.
- 4 Click **OK** to save the chosen parameters and close the dialog box.
- 5 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

6 Click **Echogram**.



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

7 In the **Echogram** dialog box, click the **Lines** tab.

8 Enable the chosen annotations to be written to the echograms.

9 Apply the change(s) you have made.

a Click **Apply** if you wish to use apply the change only to the currently active echogram view.

b Click **Apply to all** if you wish to use apply the change to all the echogram views.

10 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Lines page, page 421](#)

Working with depth layers

Topics

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

Creating a new depth layer

You can create as many depth layers as you want on the EK80. The layers may overlap if necessary. Each layer can be modified while it is active. By means of the *Numerical* information pane, you can monitor the data in the layers.

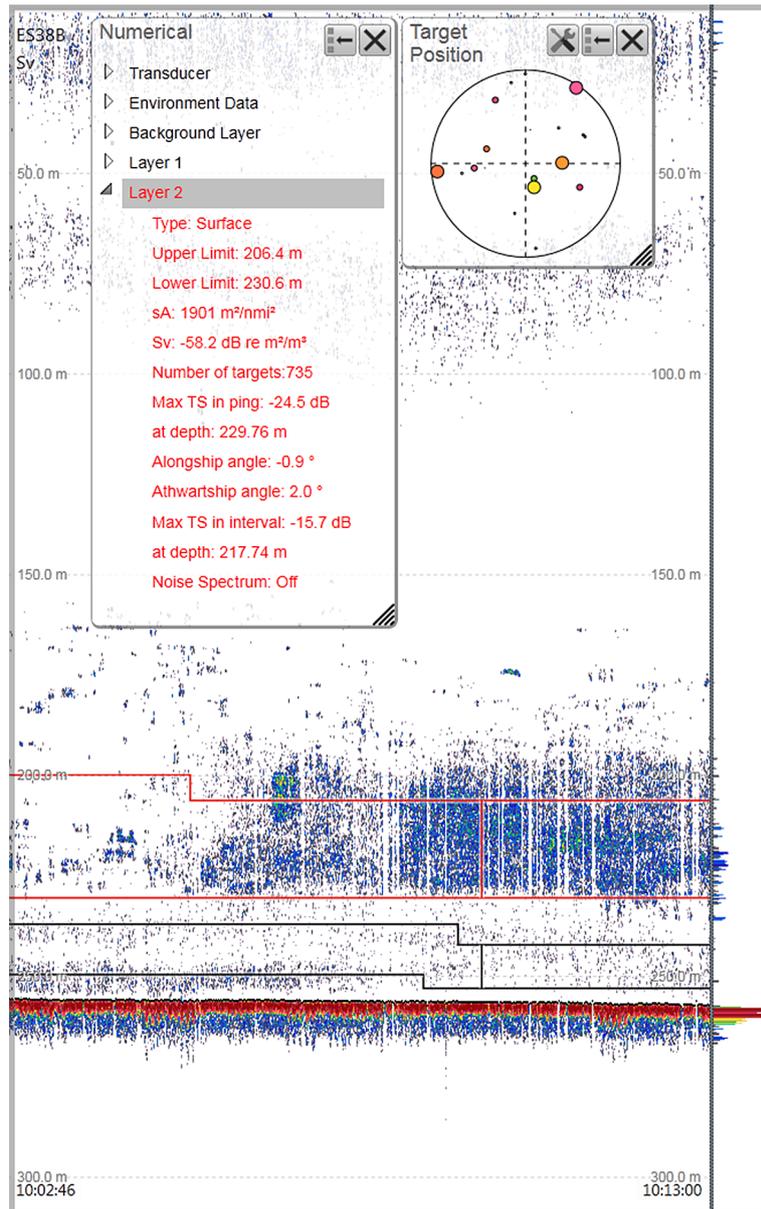
Context

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

By default, a background layer will collect 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 will be 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.

By default, any layer you create will be applied to all echogram views simultaneously.



Tip

All information shown in your information panes will reflect the echo data from 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.

The Numerical information pane is probably the best means of 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 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 2 On the **Setup** menu, click **New Layer** to open the dialog box



- 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 (related to the bottom or surface depending on the chosen layer type) and the depth range (height) of the new layer.
- 5 Set up the **Integration** parameters to match your requirements.
- 6 Click **OK** to save the chosen parameters and close the dialog box.

Result

When the 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

To select “active” layer, click between the two lines. The lines will turn to red to acknowledge.

Related topics

[Numerical information pane, page 272](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Depth layers in the echogram views, page 304](#)

Modifying an existing depth layer

You can create as many depth layers as you want on the EK80. Each layer can be modified while it is active.

Context

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.

Tip

The Numerical information pane is probably the best means of 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 the "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:
 - 1 Click between the two layer indicator lines in the echograms. The line colour will change to red.
 - 2 Select the relevant layer information in the *Numerical* information pane. The colour of the layer data will switch to red.
- 2 If you only wish to change the range settings, click on one of the two red layer indicator lines, and drag it up or down.

If you need to make more sophisticated changes, you must open the **Layer Properties** dialog box.

- 3 Click the **Active** icon.

This icon is located under the **Main** menu. It is used to open the **Active** menu.

- 4 On the **Setup** menu, click **Layer Properties** to open the dialog box



- 5 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.

- 6 Define the start depth (related to the bottom or surface depending on the chosen layer type) and the depth range (height) of the new layer.
- 7 Set up the **Integration** parameters to match your requirements.
- 8 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Numerical information pane, page 272](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Depth layers in the echogram views, page 304](#)

Deleting a depth layer

You can create as many depth layers as you want on the EK80. A single layer can be deleted if you do not need it any longer.

Context

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** on the **Active** menu.

Procedure

- 1 Select the "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:

- 1 Click between the two layer indicator lines in the echograms. The line colour will change to red.
 - 2 Select the relevant layer information in the *Numerical* information pane. The colour of the layer data will switch to red.
- 2 Click the **Active** icon.
This icon is located under the **Main** menu. It is used to open the **Active** menu.
 - 3 Click **Delete Layer**.



Related topics

[Numerical information pane, page 272](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Depth layers in the echogram views, page 304](#)

Monitoring the numerical information in the depth layers

You can create as many depth layers as you want on the EK80. The information in the layers are shown in the relevant information panes.

Context

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

Note

This is 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.

By default, a background layer will collect 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 will be 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

The Numerical information pane is probably the best means of 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 On the top bar, click the **Numerical** icon to open the information pane.
- 2 Observe that the information from the current "active" layer is shown with red text.
- 3 Select the "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:

- 1 Click between the two layer indicator lines in the echograms. The line colour will change to red.
- 2 Select the relevant layer information in the *Numerical* information pane. The colour of the layer data will switch to red.

Related topics

[Numerical information pane, page 272](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Depth layers in the echogram views, page 304](#)

Defining settings related to user preferences and individual customizing

Most EK80 systems have more than one user. Several options are available to set up the EK80 to suit individual preferences.

Topics

[Reducing the light emitted from the display presentation, page 148](#)

[Increasing the visibility of the information panes, page 149](#)

[Selecting the navigational information to appear on the top bar, page 150](#)

[Selecting which tooltips to appear in the user interface, page 150](#)

[Enabling Coordinated Universal Time \(UTC\) time at the bottom of the presentation, page 151](#)

[Changing the colour palette used in the EK80 presentations, page 152](#)

[Selecting measurement units, page 153](#)

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. To compensate for this, the intensity of light emitted by the display can be reduced.

Context

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.

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 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- Click either side of the **Screen Brightness** button to make the adjustment.



Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

Related topics

[Screen Brightness function, page 364](#)

Increasing the visibility of the information panes

When you use an information pane, you will see that it is transparent. This transparency allows you to see the echogram data behind the pane, but it may also reduce the visibility of the information in it.

Context

When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.

Procedure

- Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- Click either side of the **Transparency** button to make the adjustment.



The chosen transparency percentage is used on all open information panes.

Related topics

[Transparency function, page 365](#)

Selecting the navigational information to appear on the top bar

The top bar may contain navigational information. You can decide which information elements to be included.

Context

The **General** page in the **Display Options** dialog box controls the location of the menu, and allows you to choose which navigational information to be shown on the top bar. You can also enable the EK80 to show you Coordinated Universal Time (UTC) at the bottom of the presentation.

Procedure

- 1 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- 2 Click **Display Options**.



Observe that the **Display Options** dialog box opens.

- 3 In the **Top bar** list, click to enable the navigational information you wish to see on the top bar.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[General page, page 368](#)

Selecting which tooltips to appear in the user interface

The EK80 provides small rectangular tooltips to offer basic information of the various options in the user interface. The tooltips can be switched on or off.

Context

The **General** page in the **Display Options** dialog box controls the location of the menu, and allows you to choose which navigational information to be shown on the top bar. You can also enable the EK80 to show you Coordinated Universal Time (UTC) at the bottom of the presentation.

Procedure

- 1 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- 2 Click **Display Options**.



Observe that the **Display Options** dialog box opens.

- 3 Click the **Tooltip** tab.
- 4 In the list of tooltips, click to enable the tooltips you wish to see.
- 5 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Tooltip page, page 370](#)

Enabling Coordinated Universal Time (UTC) time at the bottom of the presentation

The EK80 can provide Coordinated Universal Time (UTC) time.

Context

The **General** page in the **Display Options** dialog box controls the location of the menu, and allows you to choose which navigational information to be shown on the top bar. You can also enable the EK80 to show you Coordinated Universal Time (UTC) at the bottom of the presentation.

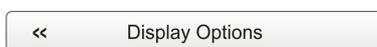
Coordinated Universal Time (French: Temps Universel Coordonné, UTC) is the primary time standard by which the world regulates clocks and time. It is one of several closely related successors to Greenwich Mean Time (GMT). For most purposes, UTC is used interchangeably with GMT, but GMT is no longer precisely 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, June 2014

Procedure

- 1 Click the **Display** icon.
This icon is located under the **Main** menu. It is used to open the **Display** menu.
- 2 Click **Display Options**.



Observe that the **Display Options** dialog box opens.

- 3 In the field at the bottom of the dialog box, click to enable Coordinated Universal Time (UTC).
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[General page, page 368](#)

Changing the colour palette used in the EK80 presentations

The overall EK80 presentation may be shown using a number of colour palettes. Such palettes are also commonly referred to as "colour themes" or even "skins". You can easily choose which palette to use.

Context

The **Palette** function provides you with options for the colour theme ("skin") used by the EK80. Select a palette to suit the ambient light conditions and your personal preferences.

The choice you make here does not have any effect on the EK80 performance.

The options are:

- **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.

Procedure

- 1 Click the **Display** icon.

This icon is located under the **Main** menu. It is used to open the **Display** menu.

- 2 Click **Colour Setup**.



Observe that the **Colour Setup** dialog box opens.

- 3 Select the colour palette you wish to use.
- 4 Click **Apply** if you wish to preview the choice you have made.
- 5 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Colour Setup dialog box, page 370](#)

Selecting measurement units

The EK80 is prepared to work with several standards for units of measurements.

Context

Use the **Units** options to set up the various units of measurements you wish to work with. The EK80 will use these in all presentations. Normally, you will only need to define these once.

Procedure

- 1 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 2 On the **Setup** menu, click **Installation**.



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

- 3 On the left side of the **Installation** dialog box, click **Units**.

Observe that the relevant options are shown on the **Units** page. You can adjust the measurement units for:

- Length
- Depth
- Distance
- Speed
- Temperature

- 4 Make the necessary adjustments.

- 5 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Units page, page 398](#)

Saving, retrieving and handling user settings

The EK80 allows you to save user settings. These are the operational parameters you use when you operate the EK80. You can save as many settings as you like, the number is only limited by the size of your hard disk.

All parameters you have chosen to set up the EK80 to suit your preferences are saved.

You can use any name - including your own - to identify the saved settings. Whenever required, you can retrieve any saved setting, and continue your work.

To reset the entire EK80, you can also retrieve the factory default settings.

Topics

[Saving the current user settings, page 154](#)

[Using previously saved user settings, page 155](#)

[Renaming user settings, page 155](#)

[Deleting user settings, page 156](#)

[Choosing EK80 factory default settings, page 157](#)

Saving the current user settings

The **User Settings** dialog box allows you to save the current user settings (your current selection of operational parameters).

Context

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.

Procedure

- 1 On the **Main** menu, click **User Settings**.



Observe that the **User Settings** dialog box opens.

- 2 Click **Save Current Setting**.
- 3 Type a name for your new setting.
- 4 Click **OK** to save the chosen name.
- 5 Observe that the name you have chosen appears on the **Saved Settings** list.
- 6 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[User Settings dialog box, page 324](#)

Using 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 allows you to shorten down the time it takes to get started with the EK80.

Context

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.

Procedure

- 1 On the **Main** menu, click **User Settings**.



Observe that the **User Settings** dialog box opens.

- 2 Observe the list of previously saved user settings in the **Saved Settings** list.
- 3 Click once on the setting you wish to use.
- 4 Click **Activate Selected Setting**.
- 5 Click **OK** to close the dialog box.

Related topics

[User Settings dialog box, page 324](#)

Renaming user settings

When you save the user settings, the name you have chosen to identify your settings is shown on the **Saved Settings** list. This name can be changed.

Context

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.

Procedure

- 1 On the **Main** menu, click **User Settings**.



Observe that the **User Settings** dialog box opens.

- 2 Observe the list of previously saved user settings in the **Saved Settings** list.
- 3 Click once on the setting you wish to rename.
- 4 Click **Rename**.
- 5 Type a new name for the selected setting.
- 6 Click **OK** to save the chosen name.
- 7 Observe that the name you have chosen appears on the **Saved Settings** list.
- 8 Click **OK** to close the dialog box.

Related topics

[User Settings dialog box, page 324](#)

Deleting user settings

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 therefore be deleted.

Context

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.

Procedure

- 1 On the **Main** menu, click **User Settings**.



Observe that the **User Settings** dialog box opens.

- 2 Observe the list of previously saved user settings in the **Saved Settings** list.
- 3 Click once on the setting you wish to delete.
- 4 Click **Delete**.
- 5 Click **Yes** to acknowledge.
- 6 Observe that the name you chose has been deleted from the **Saved Settings** list.
- 7 Click **OK** to close the dialog box.

Related topics

[User Settings dialog box, page 324](#)

Choosing EK80 factory default settings

Some times it may be useful to reset the EK80 to work with a set of known user settings. The factory settings provided are designed to offer "typical" values for all operational parameters.

Context

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.

Procedure

- 1 On the **Main** menu, click **User Settings**.



Observe that the **User Settings** dialog box opens.

- 2 Observe the **Factory Settings** list.
- 3 Click once on the setting you wish to use.
- 4 Click **Activate Selected Setting**.
- 5 Click **OK** to close the dialog box.

Related topics

[User Settings dialog box, page 324](#)

Adjusting the transceiver parameters

Topics

Selecting *Passive* transceiver mode, page 158

Adjusting the output power, page 159

Adjusting the pulse duration (length), page 159

Defining the frequency sweep (chirp) within each transmission, page 160

Defining the installation depth of the transducer, page 161

Defining the pulse type for the EK80 transmissions, page 162

Measuring the noise in passive mode, page 163

Selecting *Passive* transceiver mode

Passive mode is useful for test purposes, and when you wish to measure the ambient background noise in the sea.

Context

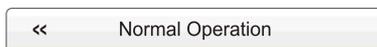
In *Passive* mode, the EK80 will receive and compute the signals detected by the transducer(s). This mode is thus useful for test purposes, and when you wish to measure the ambient background noise in the sea. It can also be useful to run the EK80 in *Passive* mode to discriminate between target echoes (present only in *Active* mode) and noise (present in both *Active* and *Passive* modes).

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 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 Click **OK** to save the chosen parameters and close the dialog box.

Related topics[Normal Operation dialog box, page 335](#)[Measuring the noise in passive mode, page 163](#)[New Layer dialog box, page 428](#)[Layer Properties dialog box, page 432](#)

Adjusting the output power

You are permitted to adjust the output power offered by the EK80. You will not be permitted to 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

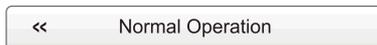
The **Power** parameter in the **Normal Operation** dialog box displays and controls the transmitter's output power measured in Watts. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest. For all practical purposes, this means that you can *reduce* the power output, but you can not increase it to beyond the power rating of the transducer.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant channel, set **Power** to the requested value.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics[Normal Operation dialog box, page 335](#)

Adjusting the pulse duration (length)

The EK80's **pulse duration** is a measurement for *how long* the acoustic pulse ("ping") lasts.

Context

The pulse duration can be adjusted according to the current depth and what kind of bottom you are looking at. The deeper you wish to see, the longer pulse duration should be used. Remember that in the EK80 echo sounder, the pulse duration and the bandwidth is mutually dependant.

- Long pulse => lots of acoustic energy => narrow bandwidth => less sensitive for noise from own vessel and environment
- Short pulse => less acoustic energy => wide bandwidth => more sensitive for noise from own vessel and environment

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant transceiver channel, set **Pulse Duration** to the requested value.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Normal Operation dialog box, page 335](#)

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. To use this feature, you must use a wideband transducer that supports the complete frequency range.

Context

Note

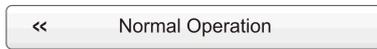
It is very important that the transducer you are using complies to the frequencies you choose. This is defined in the transducer setup file. If you choose a frequency range that is not supported, and error message will appear.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant channel, define the sweep parameters:
 - a Select the start frequency.
 - b Select the end frequency.
 - c Set **Ramping** to the desired value.

Tip _____

If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wideband transmissions.

- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Normal Operation dialog box, page 335](#)

Defining the installation depth of the transducer

The installation depth of the transducer is the vertical distance from the transducer face to the sea surface. This distance must be set correctly for correct depth measurements.

Context

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.

Tip _____

If the displacement of your vessel changes considerably, you may consider changing this parameter often.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant channel, set **Depth** to the requested value.
Enter the depth as a positive number. For example, if the distance from the water line and down to the transducer face is 3.5 meters, enter (+)3.5 m.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Normal Operation dialog box, page 335](#)

Defining the pulse type for the EK80 transmissions

The **Pulse Type** function allows you to select which type of pulse transmission you wish to use; *CW* or *FM*.

Context

"CW" means "continuous wave", while "FM" means "frequency modulated".

Note

In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated (FM) pulses.

Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant channel, set **Pulse Type** to *CW* or *FM*.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Normal Operation dialog box, page 335](#)

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

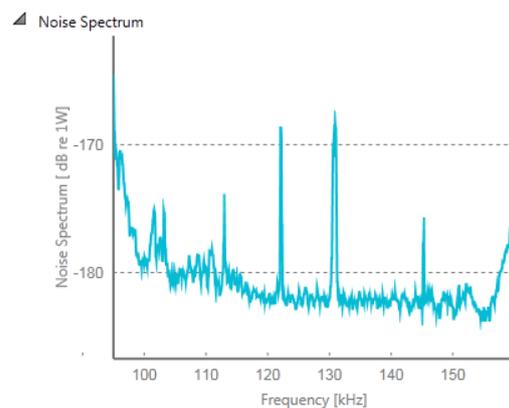
Layers are used to calculate various values from echo data collected within a specific depth range in the water column.

Such echo data may include background noise. When the **Noise Spectrum** option has been activated for a depth layer, a dedicated plot is shown at the bottom of the numerical data list in the *Numerical* information pane.

This option is by default "off".

The **Noise Spectrum** option will display 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.



Procedure

- 1 In the **Normal Operation** dialog box, set the EK80 to operate in *Passive* mode.
- 2 On the **Setup** menu, click **New Layer** to open the dialog box



- 3 Set the **Layer Type** to *Pelagic*.
- 4 Select a suitable start depth and range.
- 5 Activate the **Noise Spectrum** option.
- 6 On the top bar, click the **Numerical** icon to open the information pane.
- 7 Observe that the information from the current "active" layer is shown with red text.
- 8 At the bottom of the numerical data list, observe the noise spectrum plot.



Related topics

- [New Layer dialog box, page 428](#)
- [Layer Properties dialog box, page 432](#)
- [Selecting *Passive* transceiver mode, page 158](#)

Interfacing peripheral equipment

Topics

- [Setting up the input from a navigation system, page 164](#)
- [Setting up the input from a Motion Reference Unit \(MRU\), page 168](#)
- [Setting up the input from a sound speed sensor, page 170](#)
- [Setting up a serial line for annotation input, page 172](#)
- [Setting up depth output to an external system, page 174](#)
- [Exporting sensor data to a peripheral system, page 177](#)
- [Setting up the EK80 in a synchronized system, page 180](#)

Setting up the input from a navigation system

In order to read navigational data (position, speed, distance and heading) from an external sensor, you must choose which interface port to use, and then which datagram(s) to read.

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

Most Global Positioning System (GPS) receivers provide NMEA 0183 telegrams containing speed, sailed distance as well as geographical latitude and longitude information. Some GPS systems will also provide the current heading, but this information is normally taken from the gyro.

Procedure

- 1 Connect the navigation system to an available communication port on your Processor Unit.
- 2 Click the **Setup** icon.
This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 On the left side of the **Installation** dialog box, click **I/O Setup**.

Observe that the **I/O Setup** page is shown.

- 5 Select the interface port you wish to use.

a Observe that a list of the Processor Unit's serial and network interface ports is shown.

b Click once on the port you wish to use (serial or LAN).

c Click the **Input** button below the list to open the **Select Inputs** dialog box.

- 6 On the **Available Inputs** list, click the system/data type(s) you wish to import, then click [**►**].

To import navigation data, choose **GPS**, **DistanceLog**, **SpeedLog** and/or **Gyro**.

- 7 Verify that the chosen data type(s) are shown in the **Inputs** list.

- 8 Click **OK** to save the chosen parameters and close the **Select Inputs** dialog box.

- 9 On the **I/O Setup** page, click once on the chosen communication port to select it.

- 10 If you are using a serial port, define the relevant communication parameters.

a Click **Setup** to open the **Serial Port Setup** dialog box.

b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.

- 11 If you are using an Ethernet communication port (LAN), define the relevant communication parameters.

a Click **Setup** to open the **LAN Port Setup** dialog box.

b In the **LAN Port Setup** dialog box, define the relevant parameters for the communication.

The parameters must be set up to match your network environment.

- **Local IP Address:** This is the Internet Protocol (IP) address of the local Ethernet interface adapter (circuit board) in your Processor Unit. If you have only one Ethernet adapter, you must use the default value provided. If you have more than one Ethernet adapter on your computer, or if you use an adapter with multiple IP addresses, you must specify the IP address of the adapter you wish to use.
 - **Local Port:** This port must match the port number on the remote computer. To find the port number on the remote computer, consult the documentation for the software utility to be used. If the data communication is set up to only transmit information, this parameter is not required.
 - **Remote IP Address:** This is the Internet Protocol (IP) address for the remote computer. Since you are about to receive data, this address is unessential.
 - **Remote Port:** Since you are about to receive data, this port is unessential. Keep its default value.
- c Click **OK** to save the chosen parameters and close the **LAN Port Setup** dialog box.
- 12 Restart the EK80.
- a Close the **Installation** dialog box.
 - b Click the [X] in the top right corner to close down the program.
 - c Start the program.
 - d Open the **Installation** dialog box.
- 13 On the left side of the **Installation** dialog box, select **Navigation**→**Position**.
- a Select which NMEA sentence you wish to receive.
If you choose *Auto*, the EK80 will automatically choose among the incoming telegrams according to a predefined priority list.
 - b If applicable, define the **Talker ID**.
If your EK80 is not equipped with a keyboard, click the "keyboard" button to open an on-screen keyboard.
- 14 On the left side of the **Installation** dialog box, select **Navigation**→**Speed**.
- a Select which NMEA sentence you wish to receive.
If you choose *Auto*, the EK80 will automatically choose among the incoming telegrams according to a predefined priority list.
 - b If applicable, define the **Talker ID**.
If your EK80 is not equipped with a keyboard, click the "keyboard" button to open an on-screen keyboard.
- If you wish to define a manual speed, select **Manual Speed** and use **Speed [kts]** to choose the value.
- 15 On the left side of the **Installation** dialog box, select **Navigation**→**Distance**.

a Choose from which source you wish to receive the distance information.

b If applicable, define the **Talker ID**.

If your EK80 is not equipped with a keyboard, click the "keyboard" button to open an on-screen keyboard.

If you wish to define a manual distance, use **Distance [nmi]** to choose the value. This option is however not available if **Source** has been set to *Datagram*.

16 On the left side of the **Installation** dialog box, select **Navigation**→**Heading**.

a Select which NMEA sentence you wish to receive.

If you choose *Auto*, the EK80 will automatically choose among the incoming telegrams according to a predefined priority list.

b If applicable, define the **Talker ID**.

If your EK80 is not equipped with a keyboard, click the "keyboard" button to open an on-screen keyboard.

If you wish to define a manual heading, click **Manual Heading**, and then choose a value.

17 On the left side of the **Installation** dialog box, click **I/O Setup**.

Observe that the **I/O Setup** page is shown.

18 Verify that each communication port is functional.

a Click **Monitor** to open the **Port Monitor** dialog box.

b Check the data flow on the input communication line (**Rx Data** text field).

In order to monitor this data flow, the peripheral system must be active and transmitting information to the EK80.

c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.

If the data flow is not present, we suggest the following actions:

- Check that the peripheral system has been switched on.
- Check that the peripheral system is in fact transmitting information.
- Check the cables.
- Check that you have made the physical connection to the communication port that you are monitoring.

19 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Installation dialog box, page 382](#)

[I/O Setup page, page 349](#)

[Position page, page 400](#)

[Speed page, page 402](#)

[Distance page, page 403](#)

[Heading page, page 405](#)

Setting up the input from a Motion Reference Unit (MRU)

The information from a motion sensor (normally heave, roll and pitch) can be imported into the EK80 to increase the accuracy of the echo sounder 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.

Context

The **MotionASCII** choice supports the following datagram format:

- **Simrad Sounder/TSS1**

Simrad Sounder/TSS1 is a proprietary datagram format created by Kongsberg Maritime for heave, roll and pitch compensation. When you select this protocol, the number of sensor variables is fixed, and there is no token associated with it.

The **MotionBinary** choice supports the following datagram formats:

- **Kongsberg EM Attitude 1000**

Kongsberg EM Attitude 1000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch heave and heading. The datagram contains a 10-bytes long message. In many new designs, this datagram format has been replaced with Kongsberg EM Attitude 3000

- **Kongsberg EM Attitude 3000**

Kongsberg EM Attitude 3000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch heave and heading. The datagram contains a 10-bytes long message.

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 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 On the left side of the **Installation** dialog box, click **I/O Setup**.
Observe that the **I/O Setup** page is shown.
- 5 Select the serial interface port you wish to use.
 - a Observe that a list of the Processor Unit's serial interface ports is shown.
 - b Click once on the serial port you wish to use.
 - c Click the **Input** button below the list to open the **Select Inputs** dialog box.
- 6 On the **Available Inputs** list, click the system/data type(s) you wish to import, then click [▶].

To import motion information, choose **MotionASCII** or **MotionBinary**.

- 7 Verify that the chosen data type(s) are shown in the **Inputs** list.
- 8 Click **OK** to save the chosen parameters and close the **Select Inputs** dialog box.
- 9 On the **I/O Setup** page, click once on the chosen communication port to select it.
- 10 Define the relevant communication parameters.
 - a Click **Setup** to open the **Serial Port Setup** dialog box.
 - b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

- c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.
- 11 Verify that the communication port is functional.
 - a Click **Monitor** to open the **Port Monitor** dialog box.
 - b Check the data flow on the input communication line (**Rx Data** text field).
In order to monitor this data flow, the peripheral system must be active and transmitting information to the EK80.
 - c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.

If the data flow is not present, we suggest the following actions:

- Check that the peripheral system has been switched on.
- Check that the peripheral system is in fact transmitting information.
- Check the cables.
- Check that you have made the physical connection to the communication port that you are monitoring.

12 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Installation dialog box, page 382](#)

[I/O Setup page, page 349](#)

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.

Context

The data communication from the sound speed sensor is based on a proprietary data format.

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 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

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



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

- 4 On the left side of the **Installation** dialog box, click **I/O Setup**.
Observe that the **I/O Setup** page is shown.
- 5 Select the serial interface port you wish to use.
 - a Observe that a list of the Processor Unit's serial interface ports is shown.
 - b Click once on the serial port you wish to use.
 - c Click the **Input** button below the list to open the **Select Inputs** dialog box.
- 6 On the **Available Inputs** list, click the system/data type(s) you wish to import, then click [▶].

To import information from a sound speed sensor, choose **AML**.

- 7 Verify that the chosen data type(s) are shown in the **Inputs** list.
- 8 Click **OK** to save the chosen parameters and close the **Select Inputs** dialog box.
- 9 On the **I/O Setup** page, click once on the chosen communication port to select it.
- 10 Define the relevant communication parameters.
 - a Click **Setup** to open the **Serial Port Setup** dialog box.
 - b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

- c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.
- 11 Verify that the communication port is functional.
 - a Click **Monitor** to open the **Port Monitor** dialog box.
 - b Check the data flow on the input communication line (**Rx Data** text field).
In order to monitor this data flow, the peripheral system must be active and transmitting information to the EK80.
 - c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.

If the data flow is not present, we suggest the following actions:

- Check that the peripheral system has been switched on.
- Check that the peripheral system is in fact transmitting information.
- Check the cables.
- Check that you have made the physical connection to the communication port that you are monitoring.

12 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Installation dialog box, page 382](#)

[I/O Setup page, page 349](#)

Setting up a serial line for annotation input

Several different annotation types may be added to the echogram. You can add these manually, or import information as datagrams using a 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.

Context

The data communication from an external annotation source is based on a proprietary data format.

The EK80 supports the following datagram format for annotations.

- **Simrad ATS**

Simrad ATS is a proprietary datagram format created by Kongsberg Maritime. It allows you to import annotations from external devices.

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 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 On the left side of the **Installation** dialog box, click **I/O Setup**.

Observe that the **I/O Setup** page is shown.

- 5 Select the interface port you wish to use.

a Observe that a list of the Processor Unit's serial and network interface ports is shown.

b Click once on the port you wish to use (serial or LAN).

c Click the **Input** button below the list to open the **Select Inputs** dialog box.

- 6 On the **Available Inputs** list, click the system/data type(s) you wish to import, then click [**►**].

To import annotations from a peripheral system, choose **Annotations**.

- 7 Verify that the chosen data type(s) are shown in the **Inputs** list.

- 8 Click **OK** to save the chosen parameters and close the **Select Inputs** dialog box.

- 9 On the **I/O Setup** page, click once on the chosen communication port to select it.

- 10 If you are using a serial port, define the relevant communication parameters.

a Click **Setup** to open the **Serial Port Setup** dialog box.

b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.

- 11 If you are using an Ethernet communication port (LAN), define the relevant communication parameters.

a Click **Setup** to open the **LAN Port Setup** dialog box.

b In the **LAN Port Setup** dialog box, define the relevant parameters for the communication.

The parameters must be set up to match your network environment.

- **Local IP Address:** This is the Internet Protocol (IP) address of the local Ethernet interface adapter (circuit board) in your Processor Unit. If you have only one Ethernet adapter, you must use the default value provided. If you have more than one Ethernet adapter on your computer, or if you use an adapter with multiple IP addresses, you must specify the IP address of the adapter you wish to use.
 - **Local Port:** This port must match the port number on the remote computer. To find the port number on the remote computer, consult the documentation for the software utility to be used. If the data communication is set up to only transmit information, this parameter is not required.
 - **Remote IP Address:** This is the Internet Protocol (IP) address for the remote computer. Since you are about to receive data, this address is unessential.
 - **Remote Port:** Since you are about to receive data, this port is unessential. Keep its default value.
- c Click **OK** to save the chosen parameters and close the **LAN Port Setup** dialog box.
- 12 Verify that the communication port is functional.
- a Click **Monitor** to open the **Port Monitor** dialog box.
- b Check the data flow on the input communication line (**Rx Data** text field).
- In order to monitor this data flow, the peripheral system must be active and transmitting information to the EK80.
- c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.
- If the data flow is not present, we suggest the following actions:
- Check that the peripheral system has been switched on.
 - Check that the peripheral system is in fact transmitting information.
 - Check the cables.
 - Check that you have made the physical connection to the communication port that you are monitoring.
- 13 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Installation dialog box, page 382](#)
[I/O Setup page, page 349](#)

Setting up depth output to an external system

The depth output from the EK80 can be exported to a peripheral system.

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 current depth from a defined transceiver channel can be sent out on a serial line to an external system.

The data is exported on standard NMEA datagram formats and/or on proprietary formats.

Procedure

- 1 Connect the peripheral system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

- 2 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 3 On the **Operation** menu, click **Output**.



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

- 4 On the left side of the **Outputs** dialog box, select **Depth Output**.

Observe that the **Depth Output** page opens.

- 5 Set up the depth output port.

- a On the **Depth Output** page, select which output type (datagram) to export.

- b Click **Add**.

Observe that **Depth Output Configuration** dialog box opens to collect the communication parameters.

- c Select the communication port you wish to use.

- d Click **Inspect Port** to verify that the port parameters are correct.

If you need to adjust the port settings, you must select **I/O Setup** to correct this after you have defined the output parameters.

- e Select which channel (transceiver and frequency) you wish to export the depth information from.

Tip _____

In most cases, the lowest frequency is used.

- f If applicable, define the **Talker ID**.
 - g Click **OK** to save the chosen parameters and close the **Depth Output Configuration** dialog box.
- 6 On the left side of the **Outputs** dialog box, select **I/O Setup**.
Observe that the **I/O Setup** page is shown.
- 7 On the **I/O Setup** page, click once on the chosen communication port to select it.
- 8 If you are using a serial port, define the relevant communication parameters.
- a Click **Setup** to open the **Serial Port Setup** dialog box.
 - b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

- c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.
- 9 If you are using an Ethernet communication port (LAN), define the relevant communication parameters.
- a Click **Setup** to open the **LAN Port Setup** dialog box.
 - b In the **LAN Port Setup** dialog box, define the relevant parameters for the communication.

The parameters must be set up to match your network environment.

- **Local IP Address:** This is the Internet Protocol (IP) address of the local Ethernet interface adapter (circuit board) in your Processor Unit. If you have only one Ethernet adapter, you must use the default value provided. If you have more than one Ethernet adapter on your computer, or if you use an adapter with multiple IP addresses, you must specify the IP address of the adapter you wish to use.
- **Local Port:** This port must match the port number on the remote computer. To find the port number on the remote computer, consult the documentation for the software utility to be used. If the data communication is set up to only transmit information, this parameter is not required.
- **Remote IP Address:** This is the Internet Protocol (IP) address for the remote computer. Since you are about to receive data, this address is unessential.
- **Remote Port:** Since you are about to receive data, this port is unessential. Keep its default value.

- c Click **OK** to save the chosen parameters and close the **LAN Port Setup** dialog box.
- 10 Verify that the communication port is functional.
 - a Click **Monitor** to open the **Port Monitor** dialog box.
 - b Check the data flow on the output communication line (**Tx Data** text field).

In order to monitor this data flow, your EK80 must be active and transmitting information to the peripheral system.
 - c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.

If the data flow is not present, we suggest the following actions:

 - Check that the appropriate output data in your EK80 has been set up to the correct port, and enabled.
- 11 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Output dialog box, page 346](#)

[Depth Output page, page 356](#)

[I/O Setup page, page 349](#)

Exporting sensor data to a peripheral system

The information provided to the EK80 system from various sensors can also be useful for other systems on board. The EK80 allows you to export this sensor information on a chosen 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.

Context

The information provided to the EK80 system from various sensors can also be useful for other systems on board your vessel. The EK80 allows you to export this sensor information on a chosen communication port.

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 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 3 On the **Operation** menu, click **Output**.



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

- 4 On the left side on the **Outputs** dialog box, click **Relay Output**.

- 5 Set up the data export parameters.

- a Select which data format to export.

- b Click **Add**.

Observe that a dedicated dialog box opens to collect the communication parameters.

- c Select which communication port to use.

- d Click **Inspect Port** to verify that the port parameters are correct.

If you need to adjust the port settings, click **I/O Setup** on the left menu in the **Outputs** dialog box, and make the necessary changes to the communication port. You can do this after you have defined the output parameters.

- e Click **OK** to save the chosen settings and close the dialog box.

- 6 On the left side of the **Outputs** dialog box, select **I/O Setup**.

Observe that the **I/O Setup** page is shown.

- 7 On the **I/O Setup** page, click once on the chosen communication port to select it.

- 8 If you are using a serial port, define the relevant communication parameters.

- a Click **Setup** to open the **Serial Port Setup** dialog box.

- b In the **Serial Port Setup** dialog box, define the relevant parameters for the communication.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

- c Click **OK** to save the chosen parameters and close the **Serial Port Setup** dialog box.

- 9 If you are using an Ethernet communication port (LAN), define the relevant communication parameters.

- a Click **Setup** to open the **LAN Port Setup** dialog box.

- b In the **LAN Port Setup** dialog box, define the relevant parameters for the communication.

The parameters must be set up to match your network environment.

- **Local IP Address:** This is the Internet Protocol (IP) address of the local Ethernet interface adapter (circuit board) in your Processor Unit. If you have only one Ethernet adapter, you must use the default value provided. If you have more than one Ethernet adapter on your computer, or if you use an adapter with multiple IP addresses, you must specify the IP address of the adapter you wish to use.
- **Local Port:** This port must match the port number on the remote computer. To find the port number on the remote computer, consult the documentation for the software utility to be used. If the data communication is set up to only transmit information, this parameter is not required.
- **Remote IP Address:** This is the Internet Protocol (IP) address for the remote computer. Since you are about to receive data, this address is unessential.
- **Remote Port:** Since you are about to receive data, this port is unessential. Keep its default value.

- c Click **OK** to save the chosen parameters and close the **LAN Port Setup** dialog box.

- 10 Verify that the communication port is functional.

- a Click **Monitor** to open the **Port Monitor** dialog box.

- b Check the data flow on the output communication line (**Tx Data** text field).

In order to monitor this data flow, your EK80 must be active and transmitting information to the peripheral system.

- c If the data flow is operational, click **OK** to close the **Port Monitor** dialog box.

If the data flow is not present, we suggest the following actions:

- Check that the appropriate output data in your EK80 has been set up to the correct port, and enabled.

- 11 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Output dialog box, page 346](#)

[Relay Output page, page 360](#)

[I/O Setup page, page 349](#)

Setting up the EK80 in a synchronized system

If you wish 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

For "slave" operation, a remote system (for example *K-Sync*) must be available to provide trigger pulses. For "master" operation, a remote system must be 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 this, the systems may either be connected to a common synchronization system, or one of the acoustic systems may be defined as a "master", and control the transmission on the other system(s).

The EK80 includes interface for remote transmit synchronisation. It can be set up to operate in either *Master* or *Slave* mode in relation to an external synchronization or an other hydroacoustic system.

Procedure

- 1 Connect the synchronisation cable from the remote system to an available communication port on your Processor Unit.

This is described in the EK80 *Installation manual*.

- 2 Power up the Processor Unit, and start the EK80 program.
- 3 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 4 On the **Setup** menu, click **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number of pages selected by 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 **Synchronization Port**.

This must be a serial port. Since the synchronization function only use the Request To Send (RTS) and Clear To Send (CTS) signals, you can use a serial port that is already used for other purposes. For the same reason, you do need to define any baud rate.

- 7 Select **Synchronization Delay**.

This delay parameter is used differently depending on the chosen synchronization mode.

- **Standalone**

The **Synchronization Delay** is not applicable when synchronization is switched off.

- **Master**

The EK80 will wait 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 *Pre-trigger*.

Note that this delay will only work when the synchronization is set up using a serial port.

- **Slave**

The EK80 will wait for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as *Post-trigger*.

- 8 Select **Synchronization Mode**.

- **Standalone**

This synchronization mode is used if the EK80 is working by itself, and with no synchronization required. This is the default setting. The EK80 will operate using its internal ping interval parameters, independent of any signals arriving at the synchronization port.

- **Master**

This mode is used if the EK80 shall act as a "Master" unit in a synchronized system. The peripheral hydroacoustic system(s) will then only be permitted to transmit when enabled by the EK80. When this mode is chosen, the EK80 will run using its internal ping interval parameters, and transmit external trigger signals to the peripheral system(s) on the synchronization port.

- **Slave**

This mode is used if the EK80 shall transmit only when permitted by a peripheral device. When this mode is chosen, the EK80 will wait for an external trigger to appear on the chosen synchronization port before each ping. The peripheral device may be any other hydroacoustic system (for example an echo sounder or sonar), or even a dedicated synchronisation system.

Note

The synchronization mode is not fixed. It can be changed at any time during EK80 operation.

- 9 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Installation dialog box, page 382](#)

[Synchronization page, page 396](#)

System setup and software installation procedures

Topics

[Obtaining and installing the software license, page 183](#)

[Moving the software license from one computer to another, page 185](#)

[Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver \(WBT\)., page 187](#)

[Installing one or more transducers, page 188](#)

[Installing transceiver channels, page 189](#)

[Disconnecting transceiver channels, page 191](#)

[Installing the EK80 operational software, page 192](#)

[Upgrading the EK80 operational software, page 193](#)

[Upgrading the software on the Wide Band Transceiver \(WBT\), page 194](#)

Obtaining and installing the software license

If your EK80 shall operate with a Wide Band Transceiver (WBT), you will need a valid 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 Wide Band Transceiver (WBT).

Prerequisites

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

Context

Note

This procedure is only valid if your EK80 shall operate with a Wide Band Transceiver (WBT).

In order to obtain a software license for your EK80, you must contact a Simrad dealers or distributor. You can also use the request form on <http://www.simrad.com/support>, or contact our support department directly.

The software license is 32 character hexadecimal string built from the transceiver's serial number. It defines several key parameters that controls the functionality and behaviour of the transceiver(s) you use. The software license is not linked to the physical Processor

Unit. You can therefore easily move the EK80 software from one computer to another, just remember to take a copy of the license string.

Note

If you have purchased a complete EK80 system from Kongsberg Maritime with transducer(s) and a Processor Unit, the software license has already been installed.

Once you receive your software license string(s), do not loose them.

Procedure

- 1 Obtain the software license.
 - a Check your transceiver(s), and write down the serial number(s).
 - b For each transceiver, write down how many transducers you have connected.
 - c For each transducer, write down:
 - The center frequency
 - The Q-value
 - The maximum nominal power rating for the transducer

- 2 Send the necessary information to one of Simrad's dealers or distributors.

You can also use the request form on <http://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 EK80 software.

- 3 Observe the **Main** menu.

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

- 4 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 5 On the **Setup** menu, click **Installation**.



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

- 6 On the left side of the **Installation** dialog box, click **Software License**.

Observe that the **Software License** page opens.

- 7 Click **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, click the **Keyboard** button to open an on-screen keyboard.

Tip

*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.*

- 8 Click **OK** to save the license string and close the **Type License String** dialog box.
- 9 Verify that the license string is placed in the **Currently active licenses** list.
If necessary, click the arrow button [>] to move it from the list of inactive license string.
- 10 Click **Apply** and then **Close** to save all the parameters and close the **Installation** dialog box.

Related topics

[Installation dialog box, page 382](#)

[Software License page, page 413](#)

Moving the software license from one computer to another

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 Microsoft's Notepad) running on both computers. You will also need a USB flash disk.

Context

The software license is 32 character hexadecimal string built from the transceiver's serial number. It defines several key parameters that controls the functionality and behaviour of the transceiver(s) you use. The software license is not linked to the physical Processor Unit. You can therefore easily move the EK80 software from one computer to another, just remember to take a copy of the license string.

Procedure

1 Start the EK80 on the "old" Processor Unit.

2 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

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



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

4 On the left side of the **Installation** dialog box, click **Software License**.

Observe that the **Software License** page opens.

5 Copy all the current license strings to a text file on the memory device.

a Move all the software licenses to the **Currently active licenses** list.

b Insert a USB flash disk 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 Click **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 disk.

f Remove the USB flash disk, 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

[Installation dialog box, page 382](#)

[Software License page, page 413](#)

Defining the IP address on the Processor Unit network adapter for communication with the Wide Band Transceiver (WBT).

The communication between the Processor Unit and the transceiver(s) is made using a high speed Ethernet cable. If more than one transceiver is used, an Ethernet switch is added. In order to communicate, you recommend that 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® 7 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 an other computer, or replace the network adapter in your Processor Unit, you will only need to do this once.

Procedure

- 1 On the Processor Unit, stop the EK80 program.
- 2 Open the **Network and Sharing Center** dialog box.
 - a In the bottom left corner, click **Start**.
 - b On the right hand side of the menu, click **Control Panel**.
 - c Select **Network and Sharing Center**.
(If the Control Panel is shown with categories, select **View network status and tasks**.)
 - d On the left hand menu, select **Change adapter settings**.
 - e Click once on your network adapter to select it, then left-click and select **Properties** on the short-cut menu.
 - f On the list of connections, click **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.
- 3 Select **Use the following IP address**, and type the IP address and network mask.
IP Address: **157.237.15.16** (*Example, any IP address can be used*)
Subnet mask: **255.255.255.0**
You can leave **Subnet mask** blank and click **OK**. When you see an error message saying that the message subnet mask is missing, click **OK** again. A subnet mask will then automatically be generated.
- 4 Click **OK** to save the settings, then close all the dialog boxes.

Further requirements

If you later need to change the IP address, always restart the transceiver before you start the EK80.

Installing one or more transducers

The transducers you wish to use with your EK80 Scientific wide band echo sounder 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.

Prerequisites

It is assumed that the EK80 software has been installed, and that all relevant license strings have been applied.

Context

Transducers are installed using the **Transducer** page in the **Installation** dialog box.

The list of transducers is generated from a system file on your Processor Unit. It contains all transducers compatible with the Wide Band Transceiver (WBT) as well as key technical information about each transducer.

Procedure

- 1 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 2 On the **Setup** menu, click **Installation**.



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

- 3 On the left side of the **Installation** dialog box, click **Transducer** to open the page.
- 4 On the **Transducer** page, open the list, select which transducer you wish to install, and then click **Add**.

Observe that the **Add Transducer** dialog box opens.

- 5 Insert the transducer's serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 Scientific wide band echo sounder is calibrated.

Tip

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*

- 6 Type the name that you wish to use.
This is only for easy recognition.
The name you select will only be used to identify the transducer in other dialog boxes. It will not be reflected in raw or processed data that you export.
- 7 Click **OK** to close the **Add Transducer** dialog box.
- 8 Repeat these steps for every transducer you wish to install.

Result

Once a transducer has been defined, it will be listed in the collapsed menu on the left side of the **Installation** dialog box. To see the relevant transducer information, click on the menu entry. The parameters collected by the **Add Transducer** dialog box are then shown.

This page contains a Remove button that allows you to remove the transducer from the EK80 configuration.

Related topics

[Installation dialog box, page 382](#)

[Transducer page, page 384](#)

Installing transceiver channels

In order to use the EK80 the Processor Unit must be connected to one or more transceivers, and each of these must in turn be connected to one or more transducers. This transceiver/transducer-combination is referred to as a "channel". Each channel must be installed before it can be put to use.

Prerequisites

This procedure assumes that:

- The EK80 installation is complete with all cables connected.
- The transceiver has been powered up.
- The software license for each transceiver has been installed and activated.
- The Ethernet adapter in the Processor Unit has been 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 phrase frequency channel is used to identify the combination of a transceiver, transducers and the frequencies offered.

The frequency channel list on the top of the **Transceiver Installation** page provides you with an overview of the frequency channels currently available.

If you have many transceivers connected you can change the size of the dialog box, or you can use the two arrows on the right hand side of the list to scroll up and down.

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

Procedure

- 1 Observe the **Main** menu.

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

- 2 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 Install the frequency channels(s).

- a Observe that the transceiver(s) you have connected to the Processor Unit are shown at the top of the page.

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

If no transceivers are listed, click **Browse** in the **Transceiver Browsing** field, and open the **Local IP Address** field to select the correct address for the Ethernet adapter you are using. This will make the EK80 search the network for available transceivers. If you still have no transceivers listed, check that each transceiver has been powered up, and that the Ethernet communication between the units is operational. Also, if you are using an Ethernet switch, verify that it works.

- b For each channel, use the drop-down list to choose transducer.

The list of transducers available for installation is controlled by your software license.

Note

This is a critical task. You must ensure that the correct transducer is selected.

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

- 5 Click **OK** to save the chosen parameters and close the dialog box.

Result

When all transceiver channels have been installed, you can go to the **Operation** menu and set **Operation** to *Normal*.

Caution

You must never set the EK80 into normal operation when the ship is in dry dock. The transducer will be damaged if it transmits in open air.

Related topics

[Installation dialog box, page 382](#)

[Transceiver Installation page, page 387](#)

Disconnecting transceiver channels

A transceiver channel can be disconnected for them EK80 Processor Unit. This is typically useful if the transceiver shall be used by another Processor Unit on another echo sounder system. It is also useful if you have very many channels, and wish 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 phrase frequency channel is used to identify the combination of a transceiver, transducers and the frequencies offered.

The frequency channel list on the top of the **Transceiver Installation** page provides you with an overview of the frequency channels currently available.

If you have many transceivers connected you can change the size of the dialog box, or you can use the two arrows on the right hand side of the list to scroll up and down.

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

Procedure

- 1 Observe the **Main** menu.

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

- 2 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 3 On the **Setup** menu, click **Installation**.



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

- 4 Disconnect the requested frequency channels(s).
 - a Observe that the transceiver(s) you have connected to the Processor Unit are shown at the top of the page.

Each transceiver is identified with type and a 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, use the drop-down list to set transducer to *None*.
 - d Observe that the status for the relevant frequency channels changes to *Available*.
- 5 Click **OK** to save the chosen parameters and close the dialog box.

Result

You are not able to use the disconnected channels on your EK80. If you wish to use them again, they must be re-installed.

Related topics

[Installation dialog box, page 382](#)

[Transceiver Installation page, page 387](#)

Installing the EK80 operational software

If your EK80 Scientific wide band 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 EK80 operational 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.

Note

You need administrative rights on the Processor Unit to install the EK80 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

If you are using one or more Wide Band Transceiver (WBT), you will need valid software licences to operate the EK80. You must install one license for each transceiver after the software installation.

Procedure

- 1 Power up the Processor Unit (computer), and allow the operating system to start.
- 2 Verify that you have administrative rights on the Processor Unit.

You will need this to install the EK80 software.

- 3 Insert the EK80 software media.
- 4 Use a file manager application on the computer to access the software files.
- 5 Double-click on the `Setup.exe` file to start the installation.
- 6 Allow the installation wizard to run. Follow the instructions provided.

We recommend that you install the EK80 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 installation has been completed, double-click the EK80 icon on the desktop to start the program.
- 8 Depending on your operating system parameters, certain dialog boxes may open.
 - a Observe that Windows 7 Firewall may open a dialog box requesting information about the network. Select **Public**, and click **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 of course permit this.

Further requirements

Observe the dedicated procedures for obtaining and installing the software licences.

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 operational 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.

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

Context

You need one or more valid software licences to operate the EK80. These licences are not affected by the software upgrade.

Procedure

- 1 Power up the Processor Unit (computer), and allow the operating system to start.
- 2 Insert the EK80 software media.
- 3 Use a file manager application on the computer to access the software files.
- 4 Double-click on the `Setup.exe` file to start the installation.
- 5 Allow the installation wizard to run. Follow the instructions provided.

We recommend that you install the EK80 in the default folder suggested by the wizard.

Caution

In the last dialog box you are permitted to remove old settings. If you select this option, the installation wizard will delete all settings related to the physical installation. These include all interface parameters, and all transceiver settings. Make sure that you do not remove the software licenses.

- 6 Once the installation has been completed, double-click the EK80 icon on the desktop to start the program.
- 7 Observe the relevant start-up procedure.

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.

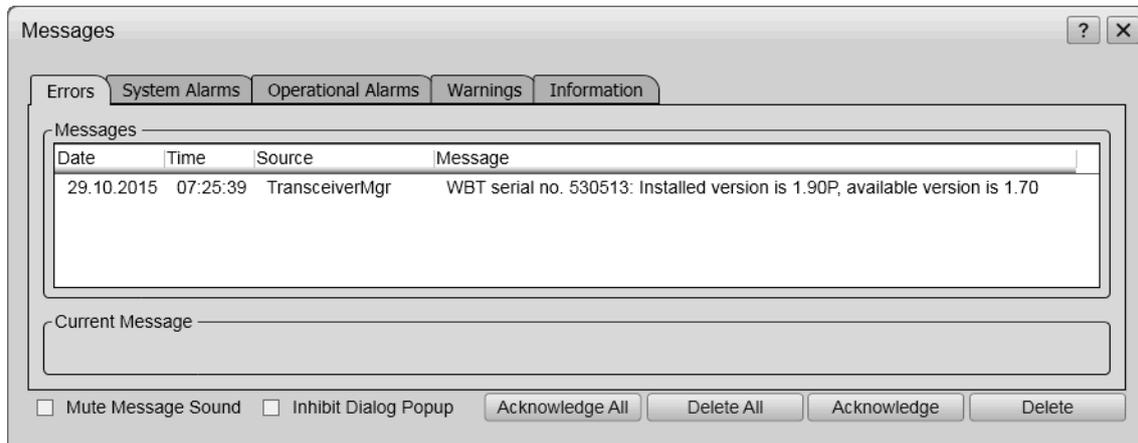
Prerequisites

In order to upgrade the EK80 operational 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.

This procedure assumes that you are familiar with the Microsoft® operating system's 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.

Procedure

- 1 Power up the Processor Unit, and start the EK80 program.
- 2 Click **Operation**, and set it to *Inactive*.



- 3 Click the **Setup** icon.

This icon is located under the **Main** menu. It is used to open the **Setup** menu.

- 4 Click **Installation**.



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

- 5 On the left side of the **Installation** dialog box, click **Transceiver**.

Observe that the **Transceiver Installation** page opens on the right hand side.

- 6 Download the new software version.

- a In the list of transceivers, click to select the transceiver you wish to upgrade.
- b Click **Download Transceiver Software**.
- c In the dialog box that opens, choose the software file you wish to use, and click **Open**.



- d Observe the information provided in the next dialog box. If you wish to download the software, click **Yes**.

Note _____

The communication between the Processor Unit and the Wide Band Transceiver (WBT) must not be interrupted while the software is downloaded!

- e Wait while the software downloads.
 - f Observe the resulting message.
If the download process has failed, restart it.
 - g If you have more than one transceiver, repeat the download process for the next one.
- 7 When the software has been downloaded, close all dialog boxes, and resume with normal operation.

Further requirements

If the download process fails repeatedly, contact Kongsberg Maritime support.

Maintaining the EK80

Topics

Updating the online help file(s) with a new version, page 197

Adding an online help file in a new language, page 198

Accessing and retrieving message log files, page 200

Monitoring the supply voltage, page 200

Rules for transducer handling, page 201

Rules for transducer maintenance, page 202

Approved anti-fouling paints, page 203

Updating the online help file(s) with a new version

The EK80 is provided with an extensive context sensitive on-line help system. Occasionally, the help file is updated. You can then update your EK80 installation with the new information.

Prerequisites

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

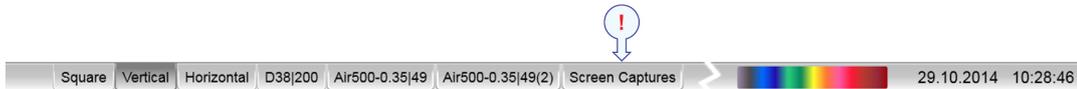
Context

The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Procedure

- 1 Obtain the new on-line help file.
 - a Download the on-line help file from <http://www.simrad.com/ek80>
 - b Change the name of the file to `EK80.chm`
The same file name is used for all languages.
 - c Copy the file to a USB flash disk.

- 2 Click the **Screen Captures** tab at the bottom of the EK80 presentation.



Observe that the built-in image browser starts. All currently saved screen capture images are shown as miniatures.

- 3 In the browser, click **Open Image Folder** to open an operating system folder.
- 4 Navigate to the folder with the on-line help files.

Observe that the folder contains one sub-folder for each language.

Typical examples are:

es = Spanish

en = English

Language folders may be missing. In such cases, the EK80 help will be provided in English.

- 5 To update an existing on-line help file.
 - a Open the language folder you wish to update.
 - b Rename the existing (old) CHM file in the language folder to `old_EK80.chm`.
 - c Using the functionality provided by the operating system to copy the downloaded file `EK80.chm` from the USB flash disk to the correct language folder.
- 6 Close the file manager utility.
- 7 Restart the EK80.

Adding an online help file in a new language

The EK80 is provided with an extensive context sensitive on-line help system. Occasionally, the help is available in a new language. You can then update your EK80 installation with the new information.

Prerequisites

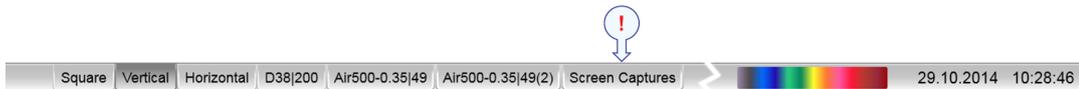
This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

Context

The context sensitive on-line help is located in a single proprietary Microsoft® CHM file. This CHM file will run on any computer with a Microsoft operating system. You can also copy the CHM file to any tablet device if you have a reader application that supports the CHM format.

Procedure

- 1 Obtain the new on-line help file.
 - a Download the on-line help file from <http://www.simrad.com/ek80>
 - b Change the name of the file to `EK80.chm`
The same file name is used for all languages.
 - c Copy the file to a USB flash disk.
- 2 Click the **Screen Captures** tab at the bottom of the EK80 presentation.



Observe that the built-in image browser starts. All currently saved screen capture images are shown as miniatures.

- 3 In the browser, click **Open Image Folder** to open an operating system folder.
- 4 Navigate to the folder with the on-line help files.

Observe that the folder contains one sub-folder for each language.

Typical examples are:

es = Spanish

en = English

Language folders may be missing. In such cases, the EK80 help will be provided in English.

- 5 To establish a new on-line help file:
 - a Create a language folder for the new language.
Make sure that you use the correct folder name.
 - b Using the functionality provided by the operating system to copy the downloaded file `EK80.chm` from the USB flash disk to the correct language folder.
- 6 Close the file manager utility.
- 7 Restart the EK80.

Accessing and retrieving message log files

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 behavior, and wish to consult support, these log files are very useful.

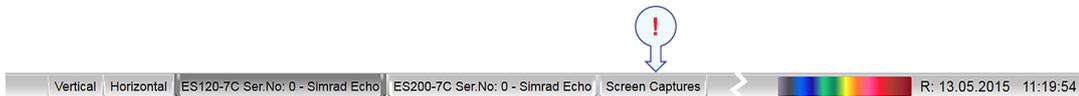
Prerequisites

This procedure assumes that you are familiar with the Microsoft® operating system's utilities for file handling.

You will need a USB flash disk or another storage device to keep the log files.

Procedure

- 1 Click the **Screen Captures** tab at the bottom of the EK80 presentation.



Observe that the built-in image browser starts. All currently saved screen capture images are shown as miniatures.

- 2 In the browser, click **Open Image Folder** to open an operating system folder.
- 3 Navigate to the folder with the log files.

The folder is:

```
c:\programdata\Simrad\EK80\Log
```

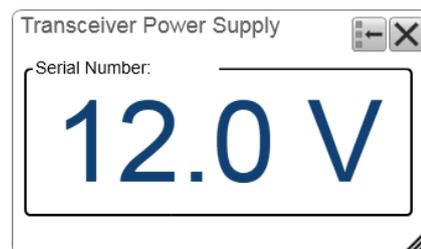
- 4 Copy all the log files to your storage device.
- 5 Close the file manager utility.
- 6 Send the file(s) by e-mail to your support contact.

Monitoring the supply voltage

The *Transceiver Power Supply* information pane allows you to keep an eye on the supply voltage to the transceiver. This is very useful if you operate your EK80 from a battery.

Context

The EK80 software measures this supply voltage in the transceiver, and the result is automatically returned to the Transceiver Power Supply information pane. You will have one information pane for each transceiver in use on your EK80 system.



- 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.

Procedure

- 1 On the top bar, click the icon to open the *Transceiver Power Supply* information pane.
- 2 Click the bottom right corner of the information pane and drag to change size.
- 3 Use the **Transparency** function to control how much you can see through the information pane.



- 4 To close the information pane, click the **Close** button.

Rules for transducer handling

To secure long life and accurate results, each transducer must be handled correctly.

A transducer must always be handled as a delicate item. Wrongful 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, sand blasting, metal tools or strong solvents to clean the transducer face.

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 the transducer face

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, sand blasting, metal tools or strong solvents to clean the transducer.

Painting the transducer face

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 can not be held responsible for any negative consequences of the anti-fouling paint.

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.

Rules for transducer maintenance

Once installed, the transducer is maintenance free. However, when the vessel is docked, it is highly recommended to clean the transducer face to remove marine growth.

- 1 Perform a thorough visual check of the transducer.
- 2 If necessary, clean the transducer.
 - To clean the transducer, use normal synthetic soap and water.
 - To remove marine growth, use fine-grade sandpaper or emery paper.
- 3 If necessary, apply a new layer of anti-fouling paint to the transducer face.

Because some paint types may be aggressive to the polyurethane in the transducer face, please consult our list of approved paints.

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, sand blasting, metal tools or strong solvents to clean the transducer face.

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 below.

Do not use high pressure water, sand blasting, metal tools or strong solvents to clean the transducer face.

Jotun

Address: P.O.Box 2021, N-3248 Sandefjord, Norway

<http://www.jotun.com>

- **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)

Data sheets and application guides can be downloaded from: <http://www.jotun.com/ww/en/b2b/technical-info/tds/index.aspx>

International Marine Coatings

Address: Stonegate Lane, Felling, Gateshead, Tyne & Wear, NE10 0JY United Kingdom

www.international-marine.com

- Intersleek tie coat + 425 FCS
 - A BXA386/BXA390/BXA391 Grey (equal parts)
 - B HKA563/HKA570/HKA571 Yellow (equal parts)Mix "A" and apply. Once dry, mix "B" and apply.

- Intersmooth 360 Ecoloflex SPC
- Micron Extra

Calibrating the EK80 Scientific wide band echo sounder

Topics

[Calibration summary, page 206](#)

[Calibration procedures, page 210](#)

[Operational procedures, page 220](#)

[Functions and dialog boxes, page 225](#)

Calibration summary

In order to maintain the accuracy provided by the Simrad EK80 and that is required for scientific applications, the echo sounder must be calibrated.

Prerequisites

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

- Reference targets (metal spheres) to fit the operational frequencies
- Winch arrangement with relevant lines to lower the sphere into the sound beam

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

Note

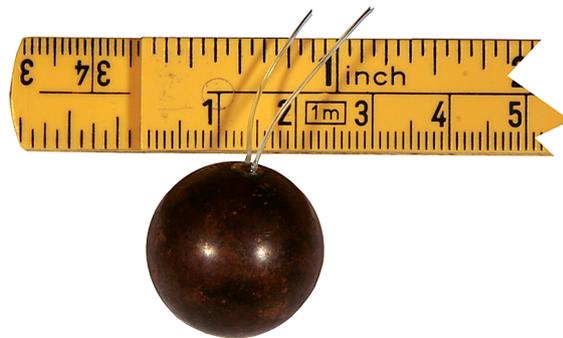
Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Context

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 then compared with the known target strength. During the calibration, the calibration sphere is physically moved inside the sound beam.

If it is necessary to adjust the EK80, this is done automatically by the calibration software. No analogue gain adjustments are required.

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.



A calibration sphere for 120 kHz

Note

If you remove or add a transducer from a calibrated EK80 system, the transceiver must be calibrated one more time. However, you may use the measured target strength (TS) from a previous calibration, as well as the reference target strength for the calibration sphere you used.

*If you have a EK80 system with several transceivers, you must calibrate one by one. Make sure that you set all other transceivers to **Passive** in the **Normal Operation** dialog box.*

A summary of the calibration process is provided.

Procedure

- 1 Prepare the vessel for EK80 calibration.
 - a Locate a suitable area for the calibration.
 - b Prepare a winch arrangement to lower the calibration target (sphere) into the water.
 - c When the vessel has reached the chosen location, lower the sphere into the water and into the sound beam.
 - d Start the EK80.
 - e Set **Operation** to *Normal*.
- 2 In the **Normal Operation** dialog box, set up the following parameters for the channel you wish to calibrate:
 - a Select **Pulse Type**.
 - b Select **Pulse Duration**.
 - c Select **Power**.
 - d If you use FM transmissions:
 - Set **Ramping** to *Slow* if you will be looking at mixture of small and large targets, or small targets near bottom.
 - Set **Ramping** to *Fast* if you are looking at equally sized targets in the water column.
 - e If you use CW transmissions:
 - Set **Ramping** to *Fast*.
- 3 Start the raw data recording.
- 4 Click **Calibration** on the **Setup** menu to open the **Calibration Wizard**.



- 5 On the first page of the wizard, select *New calibration from raw data (Real time or Replay)*, and click **Next**.

- 6 On the second page, select the channel and calibration target (sphere).
- 7 Use the **Sphere Administration** dialog box to remove bands where the calibration sphere shows very unstable target strength with sharp dips (nulls).
- 8 Click **Next**.
- 9 On the third page, adjust the size of the **Calibration Wizard** dialog box so you can also see the echogram with the calibration sphere echoes.
- 10 In the echogram, observe the layer with red lines is shown.
- 11 Use the cursor to drag the red lines above and below the calibration sphere.
Make sure to make enough space to confine the calibration sphere throughout the calibration procedure.
- 12 Click **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. Otherwise the default values will be OK for most purposes.*

- 13 Click **Start** to load the echo data.
- 14 While importing the echo data, move the sphere throughout the beam cross section.
A coverage in % is indicated for both centre and overall. Try to obtain as high coverage as possible for both.
- 15 When the coverage is acceptable, click **Stop**.
- 16 Stop the raw data recording.
- 17 Click **Next**.
- 18 On the fourth page, open the **TS Data** page to inspect the data.
Click e.g. Range on the top bar. Clicking range again, and listing goes from max to min range. In this way, it is easier to find unwanted targets. Remove (suspend) unwanted targets by clicking on them.
 - a Click **Range** on the table heading.
Detections are then listed according to range from minimum to maximum range.
 - b Click **Range** one more time.
Detections are then listed according to range from maximum to minimum range.
 - c Use the Range sorting to identify unwanted target.
 - d Remove (suspend) unwanted targets by clicking on them.
- 19 Click **Reprocess** to run the calibration processing.
- 20 Finalize the calibration process:

- a When the processing has finished, click **Finish**.
- b Save the calibration results.
- c Update the calibration used by the echo sounder; select **Merge** or **Replace**.
 - **Merge** is typically used when you wish to use different pulse lengths on the same channel (transceiver/transducer combination) to make the parameter file more complete and accurate. The calibration data for the channel will then include all the data from all the pulse lengths.
 - **Replace** is typically used when you wish to keep only the latest parameters for the relevant channel (transceiver/transducer combination).

21 Close the **Calibration Wizard** dialog box.

Further requirements

Repeat the entire procedure (from step 2) for each channel you wish to calibrate.

Calibration procedures

Topics

[Checking the echo sounder installation, page 210](#)

[Preparing the vessel for EK80 calibration, page 212](#)

[Starting the EK80 calibration, page 213](#)

[Importing the echo data, page 215](#)

[Processing the echo data, page 217](#)

Checking the echo sounder installation

Prior to calibration, you must check that your EK80 system is fully functional.

Context

A fully functional EK80 system is vital for a successful calibration. It is also necessary to measure the environmental conditions before the calibration process starts.

Procedure

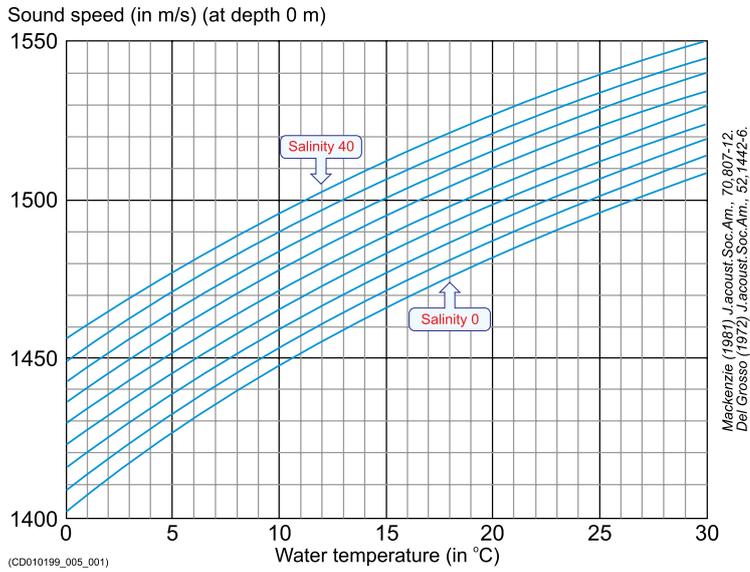
- 1 Check that the EK80 and all the transceivers and transducers are installed correctly, and that they are all fully functional.
- 2 Set **Operation** to *Normal*, and verify that the EK80 is fully operational on all channels.
- 3 Measure the water salinity and temperature between the transducer and the planned depth of the calibration sphere.
- 4 Calculate the average salinity and temperature values, and type these into the **Environment** dialog box.

The sound velocity is automatically calculated by the EK80.

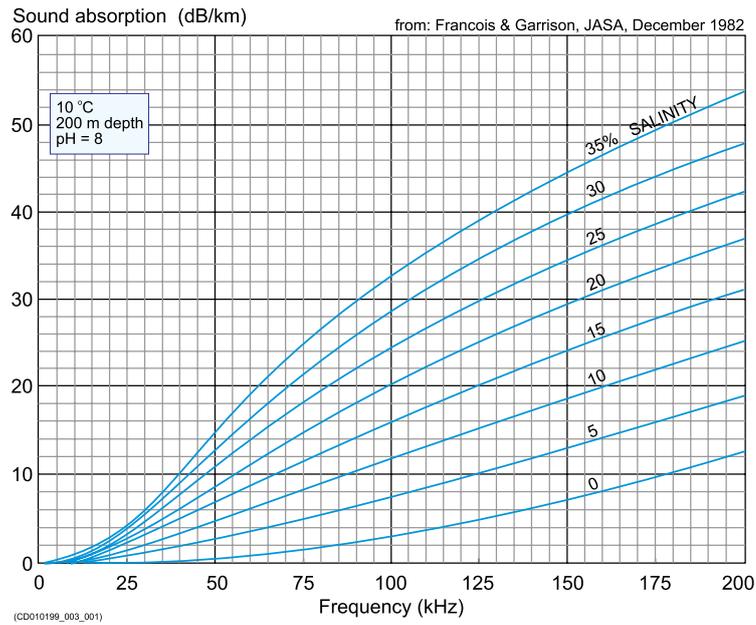
The corresponding absorption coefficient is calculated by the echo sounder according to *Francois & Garrison, JASA December 1982*.

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 location must be found. 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, consistent with maintaining a stable platform. Both bow and stern anchoring or mooring is recommended.

We recommend the use of winches to guide and steer the lines to the sphere for its centring in the EK80 beam. These winches must be mounted to the deck railing in accordance with detailed ship drawings.

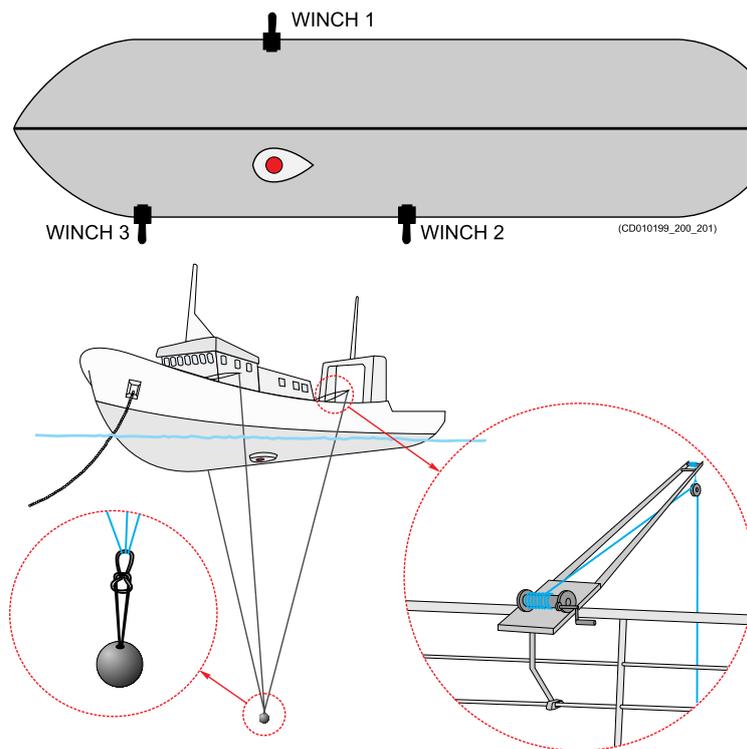
Each winch must be provided with a long spool of 0.60 mm diameter monofilament nylon line, which is marked with small swivels at 5 m intervals, beginning 10 m from the loose end.

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 Find a location with calm and sheltered water.

- a Avoid areas with large differences in tidal height, as this gives strong tidal current.
 - b Avoid areas near river mouths and harbours with heavy traffic.
 - c 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 EK80 calibration

The EK80 calibration is started by recording raw data from a sphere.

Prerequisites

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

- Reference targets (metal spheres) to fit the operational frequencies
- Winch arrangement with relevant lines to lower the sphere into the sound beam

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

Context

The **Calibration Wizard** offers four 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 and the calibration target (sphere) that are used. You can also add or delete spheres, and modify their parameters.
- 3 The third 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.
- 4 The fourth 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.

This procedure guides you through the first two pages in the wizard.

Procedure

- 1 Lower the reference target (sphere) into the sound beam.
- 2 Find a suitable folder on the Processor Unit to save the data you will record during the calibration, and specify the file name to be used.

Note

We strongly recommended that you always store the raw data from the calibration

Tip

Use the file name to identify the your physical location, the frequency used, which calibration sphere that is used, and the pulse form. The data and time of the recording are added automatically.

- 3 In the **Normal Operation** dialog box, set the pulse type you wish to use (CW or FM).
- 4 Start "pinging":
 - a Set **Operation** to *Normal*.
 - b Set **Ping Mode** to *Interval*.
 - c Set **Ping Interval** to *1000 ms* (recommended).
- 5 Click **Calibration** on the **Setup** menu to open the **Calibration Wizard**.
- 6 On the first page of the wizard, select *New calibration from raw data*.
- 7 Click **Next**.

- 8 On the second page of the wizard, select channel and calibration target (sphere) that are in use.

Tip

*The sphere parameters can be modified in the **Sphere Administration** dialog box. You can also add a new sphere if it is not listed.*

- 9 Click **Next**.

Further requirements

Proceed to the third page in the **Calibration Wizard**.

Importing the echo data

The third 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 relevant calibration target (sphere) inside the beam.

Alternatively, you can import the data from, a pre-recorded raw data file.

Context

The third page in the **Calibration Wizard** offers the following fields:

- a **Target Position**

The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All 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.

- b **Frequency/Target Detection**

The *Frequency/Target Detection* 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 **Sphere Administration** dialog box, but with a few additional features.

- c **Numerical**

The *Numerical* field provides three tabs.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.

- 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. You can select a single echo in the **TS Data** list to identify it (in red colour) in the *Target Position* field.

Procedure

- 1 In the *Frequency/Target Detection* field, verify that the calibration target (sphere) is useful for the chosen frequency range.
- 2 If relevant, change the **Max Deviation** to a lower value than the default setting.
The chosen range is shown in the *Frequency/Target Detection* field. A lower value can be useful to filter out echoes from other targets than the sphere.
- 3 In the bottom of the dialog box, click **Calibration Description** to type in relevant information about the calibration.
You can type any kind of textual information. The data is saved with in the XML files with the imported echo parameters.
- 4 Start the raw data recording.
- 5 Click **Start** to start echo data import.

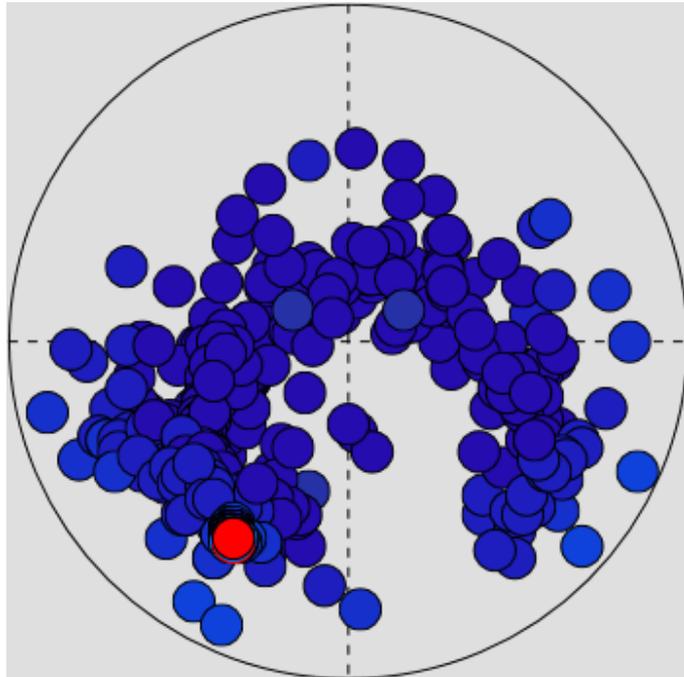
During the data import, use the three winches to move the sphere inside the sound beam. This can be done by adjusting the length of the winch wires in a programmed pattern.

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.

- 6 Observe that the echo data is added to the *Target Position* field.

During this phase, it is important that the calibration target (sphere) is moved inside the beam. You need as many echoes necessary to "paint" the beam circle with echoes. Several echoes on "top" of each other do not increase the calibration accuracy, but the distribution of the echoes within the beam circle does.



- 7 When the appropriate number of echoes have been imported, click **Stop**.
- 8 Stop the raw data recording.
- 9 Stop the "pinging".
- 10 In the bottom of the dialog box, click **Save** to save the imported data.
The resulting file is on XML format, and contains all the echo parameters that were imported. A default file name and folder location is suggested.
- 11 Click **Next**.

Further requirements

Proceed to the fourth page in the **Calibration Wizard**.

Processing the echo data

The fourth 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 in the **Calibration Wizard** offers the following fields:

a Target Position

The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All 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.

b Frequency/Target Detection

The *Frequency/Target Detection* 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 **Sphere Administration** dialog box, but with a few additional features.

c Numerical

The *Numerical* field provides five tabs.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.
- 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. You can select a single echo in the **TS Data** list to identify it (in 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 the shows all the individual echoes that are imported into the calibration program. Each echo is shown using a colour to indicate the individual target strength.

Procedure

- 1 Click the **TS Data** tab in the *Numerical* field to access the individual echoes.
- 2 "Clean" the list by suspending 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 spend them.
- 3 Click **Reprocess** to run the calibration processing.
- 4 Finalize the calibration process:
 - 1 When the processing has finished, click **Finish**.
 - 2 Save the calibration results.
 - 3 Update the calibration used by the echo sounder; select **Merge** or **Replace**.
 - **Merge** is typically used when you wish to use different pulse lengths on the same channel (transceiver/transducer combination) to make the parameter file more complete and accurate. The calibration data for the channel will then include all the data from all the pulse lengths.

- **Replace** is typically used when you wish to keep only the latest parameters for the relevant channel (transceiver/transducer combination).
- 4 Close the **Calibration Wizard**.
 - 5 Return to normal operation.

Operational procedures

Topics

[Defining the file and folder settings for raw data recording, page 220](#)

[Recording raw data, page 221](#)

[Choosing which echogram RAW data file\(s\) to replay, page 223](#)

[Defining the pulse type for the EK80 transmissions, page 223](#)

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's hard disk - or on an external data storage device - according to the preferences you have defined.

Context

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

Set up the file and folder parameters before you start the recording.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 On the **Operation** menu, click **Output**.



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

- 3 On the left side, click **File Setup** to open the page.
- 4 On the **File Setup** page, define the relevant file and folder properties.
- 5 Click **OK** to save the chosen settings and close the dialog box.

Related topics

[Output dialog box, page 346](#)

[File Setup page, page 348](#)

Recording raw data

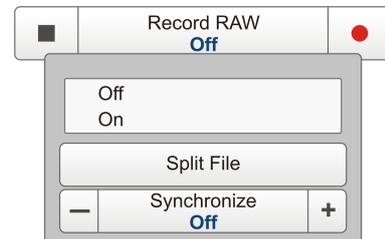
The raw data recording function provided by the EK80 allows you to save echo data on *.raw format to a file on the Processor Unit hard disk, or onto an external disk.

Prerequisites

Before you start raw data recording, make sure that you have defined where to store the data files.

Tip _____

*On the **Operation** menu, click **Output**→**File Setup** to define the recording parameters.*



Context

On the EK80, you can save and recall echo information in the following ways.

- Screen captures
- Raw data
- History file

You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.

Note

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

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 To start raw data recording, click the **Record RAW** button, and select *On*.



The **Record** button on the top bar will change colour to reflect that recording is active.

Tip

Alternatively, simply click the red circle on the right side of the button to start recording.

*To synchronize simultaneous recording of raw and processed data, open the **Record RAW** button, and set **Synchronize** to *On*. With synchronization activated, you will automatically start and stop recording using only the **Record RAW** button on the **Operation** menu, and the **Record** button on the top bar.*

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

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

- 4 To stop raw data recording, click the **Record RAW** button, and select *Off*.

Tip

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

Related topics

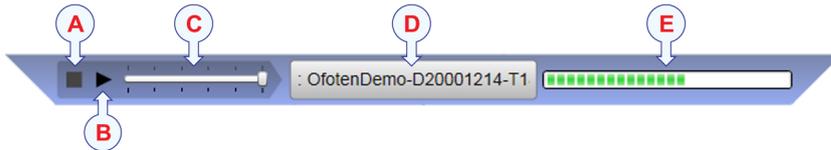
[Record RAW function, page 342](#)

Choosing which echogram RAW data file(s) to replay

Every time you record echogram data, the information is stored on the harddisk. These files can be retrieved, and played back on the EK80.

Context

All playback is controlled by the replay bar.



Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 2 Click **Operation** to open it, then click **Replay File**.



Observe that the **Replay File** dialog box opens.

The **Replay File** dialog box contains file(s) to be used for playback. The file names listed have been generated automatically during recording, and each file is identified with the time and date it was made.

- 3 Click **Add** to select new replay file(s).
A standard operating system dialog box is used to locate and select the files you wish to use.
- 4 If you wish to replay the selected files in an "endless" loop, click **Loop**.
- 5 Click **OK** to save the chosen parameters and close the dialog box.
- 6 To start playback, click **Normal**→**Replay**, and use the controllers in the replay bar.

Related topics

[Replay File dialog box, page 451](#)

Defining the pulse type for the EK80 transmissions

The **Pulse Type** function allows you to select which type of pulse transmission you wish to use; *CW* or *FM*.

Context

"*CW*" means "continuous wave", while "*FM*" means "frequency modulated".

Note

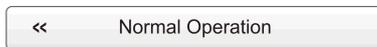
In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated (FM) pulses.

Procedure

- 1 Click the **Operation** icon.

This icon is located under the **Main** menu. It is used to open the **Operation** menu.

- 2 Click **Normal Operation**.



Observe that the **Normal Operation** dialog box opens.

- 3 For the relevant channel, set **Pulse Type** to *CW* or *FM*.
- 4 Click **OK** to save the chosen parameters and close the dialog box.

Related topics

[Normal Operation dialog box, page 335](#)

Functions and dialog boxes

Topics

[Calibration Wizard dialog box \(Page 1\), page 225](#)

[Calibration Wizard dialog box \(Page 2\), page 226](#)

[Calibration Wizard dialog box \(Page 3\), page 227](#)

[Calibration Wizard dialog box \(Page 4\), page 232](#)

[Sphere Administration dialog box, page 235](#)

[Add/Edit Sphere dialog box, page 237](#)

[Calibration Description dialog box, page 239](#)

[Single Target Detection dialog box, page 240](#)

Calibration Wizard dialog box (Page 1)

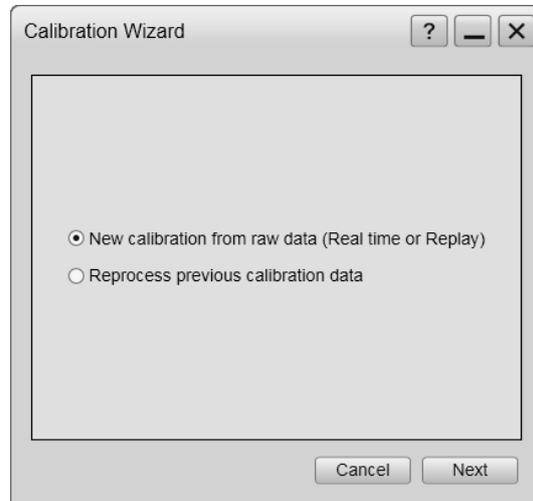
The first page in the **Calibration Wizard** allows you to either start a new calibration process, or return to a previous calibration process reusing saved data.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the first page in the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode, and click **Calibration** on the **Setup** menu.



Description

The following options are provided:

- **New calibration from raw data (Real time or Replay)**

Select this option if you are starting a new calibration process from scratch. You can either use "live data" for the calibration, or data that are previously recorded.

Note _____

It is possible to calibrate the EK80 using recorded data instead of live data. However, 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 if you have a previous calibration XML data file available for the calibration.

Note _____

If you remove or add a transducer from a calibrated EK80 system, the transceiver must be calibrated one more time. However, you may use the measured target strength (TS) from a previous calibration, as well as the reference target strength for the calibration sphere you used.

Related topics

[Calibration Wizard dialog box \(Page 2\), page 226](#)

[Calibration Wizard dialog box \(Page 3\), page 227](#)

[Calibration Wizard dialog box \(Page 4\), page 232](#)

Calibration Wizard dialog box (Page 2)

The second page in the **Calibration Wizard** allows you to select the channel and the calibration target (sphere) that are used. You can also add or delete spheres, and modify their parameters.

Prerequisites

The **Calibration Wizard** dialog box can only be opened within the calibration process. In order to start the wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the second page in the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode. Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and click **Next**.

Description

The following options are provided:

- **Channel**

Select from which channel (transceiver, transducer and frequency) the echoes from the calibration target (sphere) are taken.

If you work with "live data", it is very important that you choose the correct channel, and that all the other channels are switched off in the **Normal Operation** dialog box.

If you calibrate with replay data, the channel identification is recorded as a part of the raw data. You must still make sure that the correct channel is used.

- **Sphere**

Select which calibration target (sphere) that is used for the calibration.

If you need to make changes to the sphere properties, or wish to add a new sphere, click **Sphere Administration** to open the dedicated dialog box.



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.

Related topics

[Sphere Administration dialog box, page 235](#)

[Add/Edit Sphere dialog box, page 237](#)

Calibration Wizard dialog box (Page 3)

The third 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 wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the third page in the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode. Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and click **Next** to proceed to the second dialog box in the **Calibration Wizard**. On the second page, click **Next**.

Description

The third page in the **Calibration Wizard** offers the following fields:

a **Target Position**

The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All 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.

b **Frequency/Target Detection**

The *Frequency/Target Detection* 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 **Sphere Administration** dialog box, but with a few additional features.

c **Numerical**

The *Numerical* field provides three tabs.

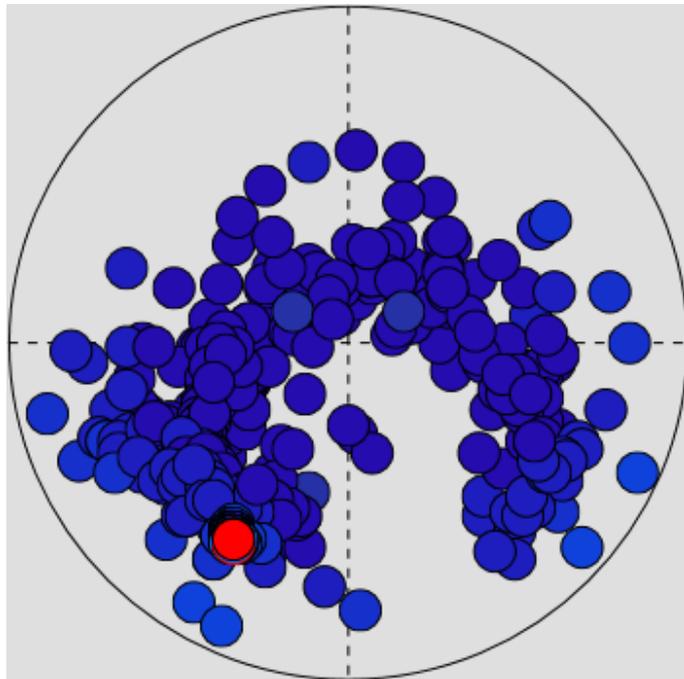
- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.
- The **Channel Data** page displays numerical parameters related to the transceiver channel that was used to record the echo data.
- The **TS Data** page displays the numerical parameters related to each individual echo. You can select a single echo in the **TS Data** list to identify it (in red colour) in the *Target Position* field.

Target Position field

Each and every echo received from the calibration target(sphere) are placed within the circular beam model on the left side of the *Target Position* field.

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.

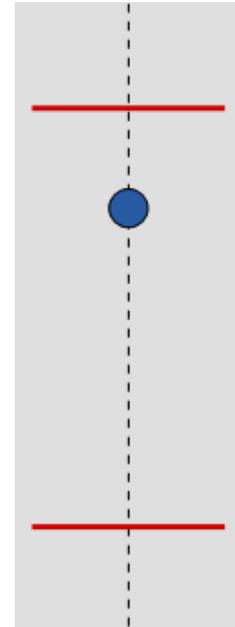
If you click on a single echo on the **TS Data** list (in the *Numerical* field), the relevant echo is shown with a red colour in the *Target Position* field.



Note

*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 will be able to remove the echoes that you do not wish to be included in the calibration.*

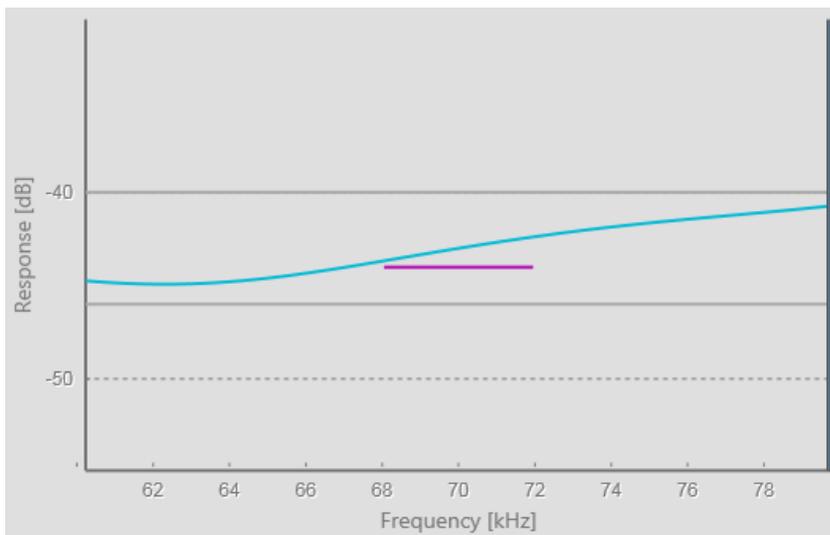
On the right side of the circular beam model you can see how each individual echo is received within the calibration layer. This calibration layer is automatically established when the **Calibration Wizard** is started. Its purpose is to remove echoes over and below the calibration target(sphere). You 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 Detection field

The *Frequency/Target Detection* field is located immediately below the *Target Position* field.



The field show the relationship between the frequency and the target detection for the sphere that is in current use.

- A** This blue line represents the relationship curve.
- B** The two grey lines reflect the current limits defined by the **Max Deviation** setting in the bottom right corner of the dialog box. Echoes over and below these lines will not be imported into the calibration process.
- C** The purple line reflects the bandwidth of the current "ping". The bandwidth is inverse proportional with the pulse length.

Numerical field

The *Numerical* field offers three tabbed pages.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.

- 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. You can select a single echo in the **TS Data** list to identify it (in red colour) in the *Target Position* field.

Note

*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 will be able to remove the echoes that you do not wish to be included in the calibration.*

Details

Start/Stop

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.

If you are doing the calibration with "live data", keep importing echoes until these are evenly distributed inside the circular beam.

Save/Save AS

These buttons allow you to save the calibration data before you continue to page four in the Calibration Wizard.

Note that you are not saving raw data here, but an XML file that contains the information necessary to run the calibration process.

Calibration Description

This button opens a dedicated dialog box that allows you to type in information about the current calibration. The information you type in is saved in the XML file.

Single Target Detection

This button opens 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 settings made will not have any effect on the raw data that you save during the survey.

Max Deviation

This parameter allows you to control the maximum permitted deviation for the echoes from the calibration target (sphere). Echoes outside the defined limits will not be imported.

The limit you define is shown in the *Frequency/Target Detection* field.

Related topics

[Calibration Description dialog box, page 239](#)

[Single Target Detection dialog box, page 240](#)

Calibration Wizard dialog box (Page 4)

The fourth 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 wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

To open the fourth page in the **Calibration Wizard**, place the EK80 in either *Normal* or *Replay* mode. Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and click **Next** to proceed to the second dialog box in the **Calibration Wizard**. On the second and third pages, click **Next**.

If you select *Reprocess previous calibration data* on the first page of the **Calibration Wizard**, **Next** will take you straight to the fourth page.

Description

The fourth page in the **Calibration Wizard** offers the following fields:

a **Target Position**

The left side of the *Target Position* field shows all the individual echoes that are imported into the calibration program. All 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.

b **Frequency/Target Detection**

The *Frequency/Target Detection* 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 **Sphere Administration** dialog box, but with a few additional features.

c **Numerical**

The *Numerical* field provides five tabs.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.
- 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. You can select a single echo in the **TS Data** list to identify it (in 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 the shows all the individual echoes that are imported into the calibration program. Each echo is shown using a colour to indicate the individual target strength.

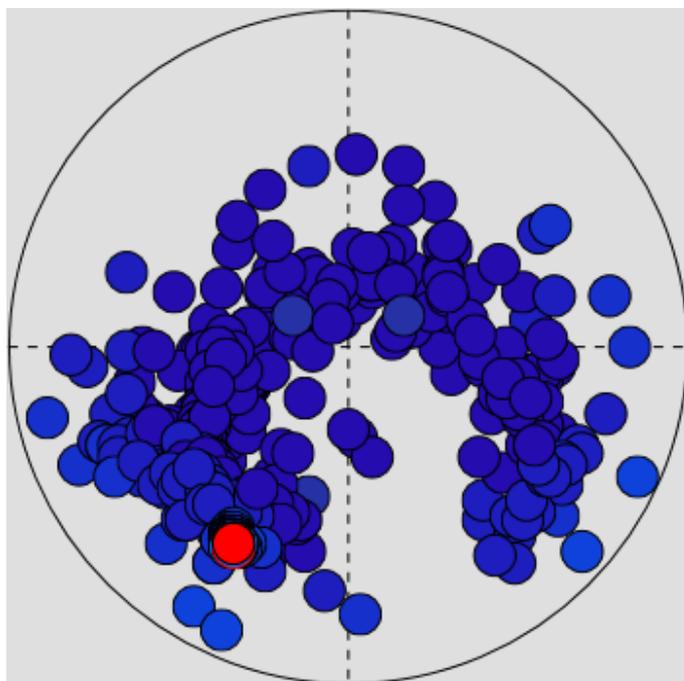
Target Position field

Each and every echo received from the calibration target(sphere) are placed within the circular beam model on the left side of the *Target Position* field.

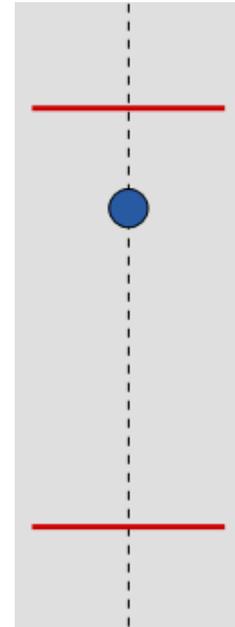
The echoes are compensated for their positions within the beam, so that echoes from the outer edge appear with the same echo strength as those in the middle of the beam.

If you click on a single echo on the **TS Data** list (in the *Numerical* field), the relevant echo is shown with a red colour in the *Target Position* field.

On this list, you can select each individual echo on the left side of the table (**Suspended**), and remove it from the calibration processing.



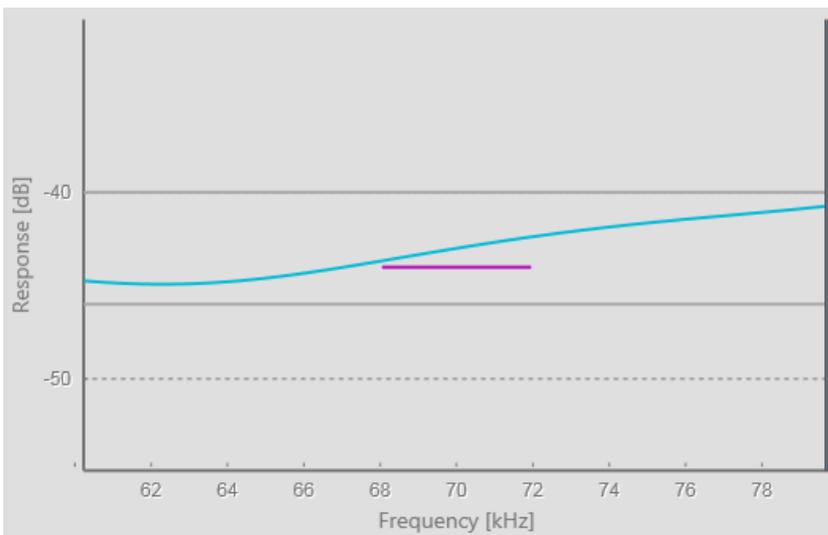
On the right side of the circular beam model you can see how each individual echo is received within the calibration layer. This calibration layer is automatically established when the **Calibration Wizard** is started. Its purpose is to remove echoes over and below the calibration target(sphere). You 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 Detection field

The *Frequency/Target Detection* field is located immediately below the *Target Position* field.



The field show the relationship between the frequency and the target detection for the sphere that is in current use.

- A** This blue line represents the relationship curve.
- B** The two grey lines reflect the current limits defined by the **Max Deviation** setting in the bottom right corner of the dialog box. Echoes over and below these lines will not be imported into the calibration process.
- C** The purple line reflects the bandwidth of the current "ping". The bandwidth is inverse proportional with the pulse length.

Numerical field

The *Numerical* field offers five tabbed pages.

- The **General** page displays numerical parameters related to the calibration target (sphere) and the target strength detection.

- 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. You can select a single echo in the **TS Data** list to identify it (in 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 the shows all the individual echoes that are imported into the calibration program. Each echo is shown using a colour to indicate the individual target strength.

The **TS Data** page allows you to remove echoes that you do not wish to use in the calibration. Click on the titles in the top row of the table to sort the various columns. Click **Suspend** in the left column to remove the echo from the calibration.

Details

Reprocess

This button starts the calibration processing. The function stops automatically. You can calibrate as many times as you like.

Save/Save AS

These buttons allow you to save the calibration data before you continue to page four in the Calibration Wizard.

Note that you are not saving raw data here, but an XML file that contains the information necessary to run the calibration process.

Calibration Description

This button opens a dedicated dialog box that allows you to type in information about the current calibration. The information you type in is saved in the XML file.

Related topics

[Calibration Description dialog box, page 239](#)

[Single Target Detection dialog box, page 240](#)

Sphere Administration dialog box

The **Sphere Administration** dialog box allows you to add or remove calibration spheres, and to modify their parameters.

Prerequisites

The **Sphere Administration** dialog box can only be opened in the **Calibration Wizard**. In order to access this wizard, the EK80 must be in either *Normal* or *Replay* mode.

How to open

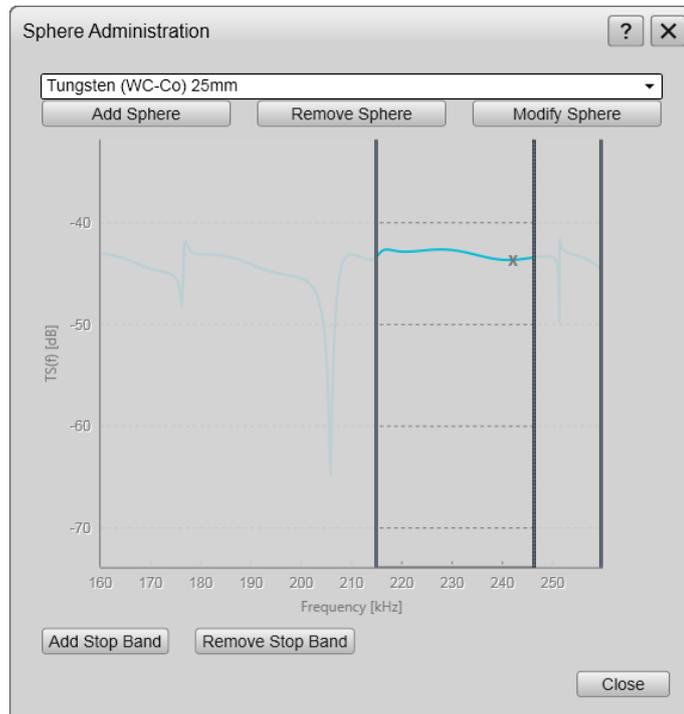
To open this dialog box, place the EK80 in either *Normal* or *Replay* mode.

Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and proceed to the second dialog box in the **Calibration Wizard**.

Description

Calibration spheres are provided in different sizes to fit different operational frequencies. They are also manufactured from different materials, mainly Copper (Cu) and Tungsten (WC-Co).

For the currently selected sphere, the **Sphere Administration** dialog box 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 Stop Band** and **Remove Stop 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>

Details

Select Sphere

By default, the **Sphere Administration** dialog box opens with the sphere selected in the second dialog box in the **Calibration Wizard**. You can use this function to select another sphere.

Add Sphere

Click this button to add a new sphere (calibration target) to the list. A dedicated dialog box is used to accept the necessary parameters.

Remove Sphere

Click this button to remove the currently selected sphere (calibration target) from the list.

Modify Sphere

Click this button to modify the parameters of the currently selected sphere (calibration target). A dedicated dialog box is used to accept the necessary parameters.

Add Stop Band

Click this button to add a frequency band to the target strength/frequency curve. Only the frequencies inside 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 Stop Band

Click this button to remove a frequency band from the target strength/frequency curve.

Related topics

[Calibration Wizard dialog box \(Page 2\), page 226](#)

[Add/Edit Sphere dialog box, page 237](#)

Add/Edit 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 can only be opened in the **Calibration Wizard**. In order to access this wizard, the EK80 must be in either *Normal* or *Replay* mode.

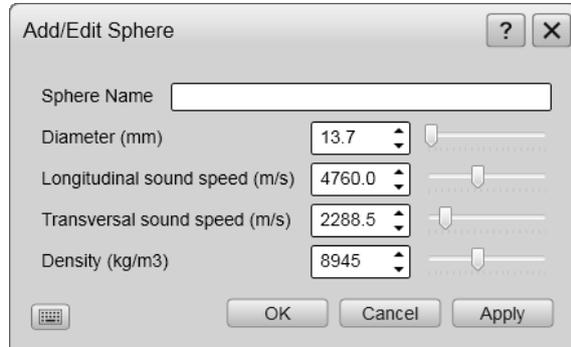
How to open

To open this dialog box, place the EK80 in either *Normal* or *Replay* mode.

Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and proceed to the second dialog box in the **Calibration Wizard**.

Description

Calibration spheres are provided in different sizes to fit different operational frequencies. They are also manufactured from different materials, mainly Copper (Cu) and Tungsten (WC-Co).



Tip _____

*To see the curve that shows the relationship between the operational frequency and the sphere's target strength, use the **Sphere Administration** 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.

Tip _____

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*

Note that while editing the sphere parameters, you are not permitted to change its name.

Diameter (mm)

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 related to water

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/m³
- **WC:** 14900 kg/m³

Related topics

[Calibration Wizard dialog box \(Page 2\), page 226](#)

[Sphere Administration dialog box, page 235](#)

Calibration Description dialog box

The **Calibration Description** dialog box allows you to record meta-information about your current calibration operations.

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.

Click **Calibration** on the **Setup** menu, select *New calibration from raw data (Real time or Replay)*, and proceed to the third and fourth pages in the **Calibration Wizard**.

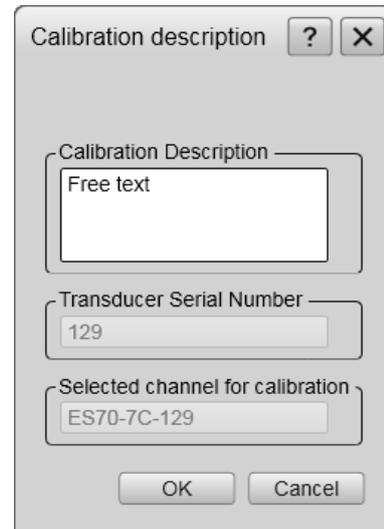
Description

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 date and time of the calibration are automatically added to the XML file names.

The information you type in is added to the XML file with the calibration data.

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 topics

[Calibration Wizard dialog box \(Page 3\), page 227](#)

[Calibration Wizard dialog box \(Page 4\), page 232](#)

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.

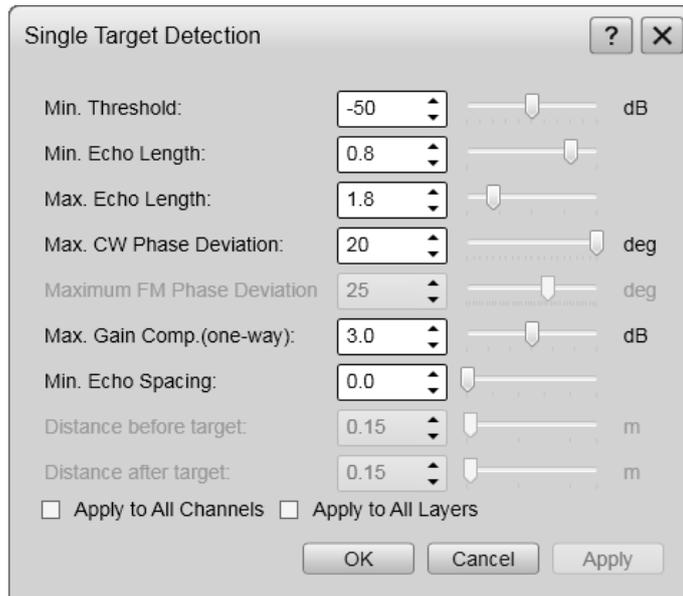
Description

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.



Details

Min. Threshold

This setting applies to both CW and FM operation.

Some echoes will be 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 for both CW and FM operation.

The target strength for a single target must exceed this threshold (in dB) to be accepted.

Tip

Use this function to define a "filter" value.

Min. Echo Length / Max. 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 these settings, 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 the 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 the maximum echo length to 1.8, all echoes longer than 1.8 times the length of the transmitted pulse will be deleted.

Tip _____

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.

Max. 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.

Tip _____

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.

Max. 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 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.

Tip _____

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.

Max. 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.

Min. 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 **Apply to All Channels** to use the selected setting(s) on all the channels presently in use on the EK80.

Apply to All Layers

Select **Apply to All Layers** to use the selected setting(s) on all the depth layers presently in use on the EK80.

Related topics

[Calibration Wizard dialog box \(Page 3\), page 227](#)

[Calibration Wizard dialog box \(Page 4\), page 232](#)

User interface

Topics

[EK80 screen layout, page 246](#)

[Top bar, page 248](#)

[Information panes, page 258](#)

[Echogram views, page 282](#)

[Echogram markers, page 295](#)

[The EK80 menu system, page 301](#)

[Status bar, page 302](#)

[Replay bar, page 303](#)

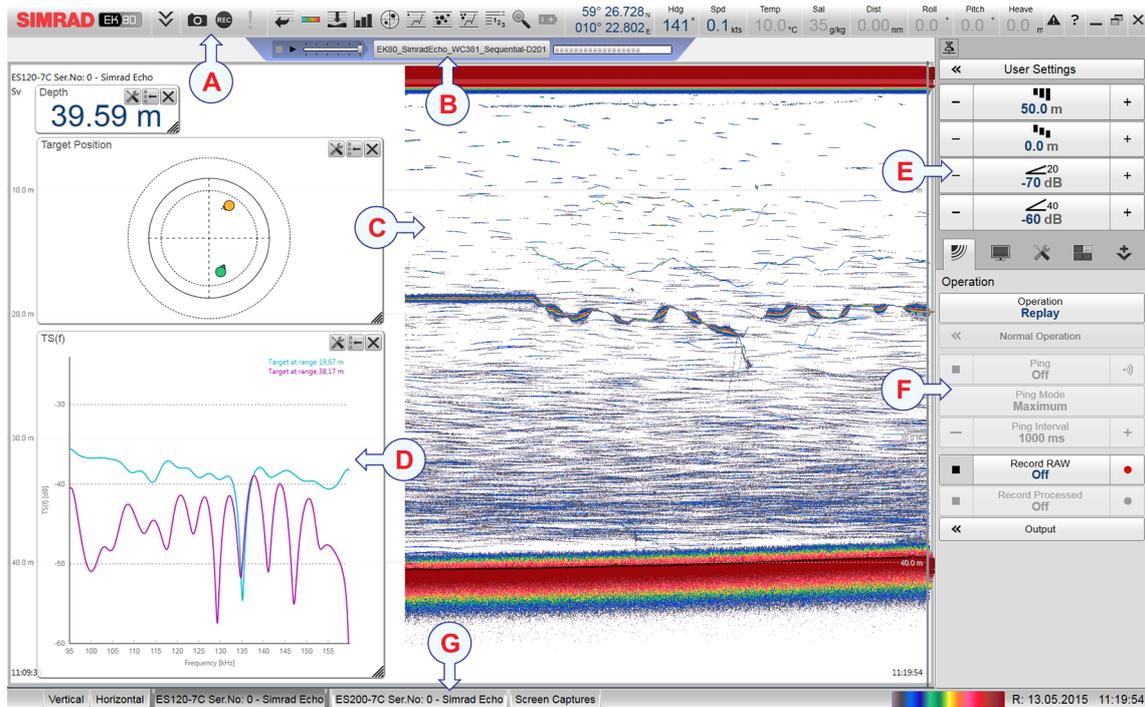
[Depth layers in the echogram views, page 304](#)

[Screen capture browser, page 307](#)

EK80 screen layout

By default, the EK80 presentation covers the entire screen.

This EK80 screen capture shows you a typical operational situation.



The presentation provides you with a lot of information. You can see one echogram views, 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 top bar identifies Simrad as the manufacturer, and the name of the product (EK80). It also provides several information read-outs and buttons. These are used to hide or retrieve the menu system and the information panes, show you navigational information, and to enable basic system functionality.

B Replay bar

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

C Echogram view

The echograms take up the largest part of the EK80 presentation.

By default, you will have one echogram for each frequency channel (transceiver/transducer combination). You can choose which type of echogram you wish to see; *surface related*, *bottom related*, *pelagic* or *trawl*. If you have more than one frequency channel, the echograms for each frequency can be presented horizontally with one over the other, or vertically next to each other. This is controlled by the transducer tabs on the status bar.

This echogram example shows you a surface related echogram.

D Information panes

Several information panes are available to offer detailed information from the echo data. The information panes are opened from the top bar.

E Main menu

The menu system is by default located on the right hand side of the presentation. To open any of the sub-menus, click the icons under the **Main menu** menu. To hide or retrieve the **Main menu** menu, click the **Main menu** button on the top bar.



F Secondary menus

The secondary menus are opened and closed by clicking the buttons at the bottom of the **Main menu**.



G Status bar

The status bar is located at the bottom of the EK80 presentation.

Related topics

[Top bar, page 248](#)

[Information panes, page 258](#)

[Echogram views, page 282](#)

[The EK80 menu system, page 301](#)

[Status bar, page 302](#)

Top bar

Topics

- [Top bar purpose and description, page 248](#)
- [Logo and product name, page 249](#)
- [Menu button, page 249](#)
- [Screen capture, Record and Event buttons, page 250](#)
- [About the information panes, page 251](#)
- [Navigational information, page 253](#)
- [Messages button, page 256](#)
- [Operating system function buttons, page 257](#)

Top bar purpose and description

The EK80 top bar is located on the top of the display presentation, and stretches from the far left to the far right side.

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.

And more important, the top bar holds the dedicated buttons to open the various information panes.

It also provides a few buttons related to operating system features.



A Logo and product name

This element identifies the manufacturer and the product.

B Menu button

Click this button to hide or show the menu system.

C Screen capture, Record and Event

These buttons are provided for easy access to recording and annotation functions.

D Information panes

Click any of these buttons to open and close selected information panes.

E Navigational information

These are not buttons, but information read-outs providing current data related to the vessel location, heading and movements. To select which information to see here, use the **Display Options** dialog box on the **Display** menu.

F Messages.

Click this button to open the **Messages** dialog box. This button will flash to indicate that a message is posted. The button colour indicates the severity of the message.

G Operating system functions

- **Help:** Click this button to open the context sensitive on-line help.
- **Minimize :** Click this button to minimize the EK80 presentation.
- **Maximize/Normalize:** Click this button to change the size of the EK80 presentation.
- **Close:** Click this button to close down the EK80.

Note

The information shown on the top bar must not be used for vessel navigation.

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

The **Menu** button is located on the left side of the top bar.

Description

Unless you need to make frequent changes to the operational parameters, you may wish to hide the menu from the EK80 presentation. This will give you more space to present echo data.



To hide the menu, click once on the **Menu** button. To retrieve it, click one more time.

Tip

When the menu is hidden, it will temporarily be shown on the left or right hand side of the EK80 presentation if you move the cursor to that position.

Related topics

[The EK80 menu system, page 301](#)

Screen capture, Record and Event buttons

These function buttons on the top bar give you easy access to recording and annotation functions.

Recording echogram data is a key function provided by the EK80, and it is important to be able to monitor when recording is active.

When you use the EK80 actively, you may also need to make a screen capture to save an instantaneous image of the current echogram presentation. Before you do this, you may even want to place an event marker on the echogram.

Screen capture button

Click this button once to create a screen capture of the current echogram presentation. To view the recorded image, click **Screen Capture** on the status bar. This opens the built-in image browser, which allows you to retrieve the images.



The screen captures you make are saved on the Processor Unit's hard disk in JPG format.

Tip

*To find the images, click the **Open Image Folder** button in the image browser. By means of standard operating system functionality you can then move, copy or delete each image.*

Record

This button is only used to show you if a recording is in progress. This is indicated with a red colour in the button.



To start and stop the recording, use the **Record RAW** and **Record Processed** functions on the **Operation** menu.

Event button

The **Event** button is used to initiate an event annotation on the echogram.

To set up the type of event, observe the options in the **Annotations** page in the **Installation** dialog box.



Related topics

[Screen capture browser, page 307](#)

About the 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 relevant buttons on the top bar.

In order to open an information pane, you must first click in an echogram presentation



to make it "active". By doing this you

select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

To *close* the information pane, click the button one more time. You can also click the **Close** button 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. Note that this information pane does not use the same presentation method as the other panes.

- **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.

- **Target Strength Histogram**

The *Target Strength Histogram* information pane shows you a histogram of the echoes detected from single fishes. The histogram presents the strength of the echoes (shown in dB).

- **Target Position**

The *Target Position* information pane shows the position of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The view is "from above". The colours indicate the echo strength.

- **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.

- **Biomass**

The *Biomass* information pane displays an index of the biomass in the current echogram view. The biomass index is the same as the NASC (Nautical area scattering strength) with unit m^2/nmi^2 .

- **Sv(f)**

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency.

- **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 zoom in on a chosen area in the current echogram.

- **Transceiver Power Supply**

The *Transceiver Power Supply* information pane shows you the current supply voltage to the Wide Band Transceiver (WBT).

Tip

You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Related topics

- [History information pane, page 258](#)
- [Colour Scale information pane, page 260](#)
- [Depth information pane, page 261](#)
- [Target Strength Histogram information pane, page 263](#)
- [Target Position information pane, page 265](#)
- [TS\(f\) information pane, page 266](#)
- [Biomass information pane, page 268](#)
- [Sv\(f\) information pane, page 270](#)
- [Numerical information pane, page 272](#)
- [Zoom information pane, page 278](#)
- [Transceiver Power Supply information pane, page 280](#)

Navigational information

The navigational information is located on the middle of the top bar.

Prerequisites

To choose which navigational information to be displayed on the top bar, use the **Display Options** dialog box on the **Display** menu.



Description

These are not buttons, but separate fields that show you useful information related to the vessel and/or EK80 operation.

Tip

*To set up the various operational parameters related to navigational inputs, open the **Installation** dialog box on the **Setup** menu, and investigate the **Sensor configuration** pages.*

Note

The information shown on the top bar must not be used for vessel navigation.

Topics

[Position read-out, page 254](#)

[Heading read-out, page 254](#)

[Speed read-out, page 254](#)

[Temperature read-out, page 255](#)

[Distance read-out, page 255](#)

[Roll, Pitch and Heave read-outs, page 256](#)

[Depth read-out, page 256](#)

Position read-out

The vessel's current geographical position is shown of the top bar.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box on the **Display** menu.



Description

If a positioning sensor (GPS) is connected to the EK80 Processor Unit, the top bar may show you the vessel's geographical position in longitude and latitude.

Note

The information shown on the top bar must not be used for vessel navigation.

Heading read-out

The vessel's current heading may be shown of the top bar.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box 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.

Speed read-out

The vessel's current speed may be shown on the top bar.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box on the **Display** menu.



Description

If a speed sensor is connected to the EK80 Processor Unit, the top bar may show you the vessel's current heading.

The speed is by default shown in knots, but you can change this on the **Units** page in the **Installation** dialog box.

Tip

*You can define a manual speed value on the **Navigation: Speed** page in the **Installation** dialog box.*

Temperature read-out

The navigational information on the top bar may include a read-out of the current water temperature.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box on the **Display** menu.

**Description**

If a temperature 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 see the water temperature, but it will display any temperature reading that is made by the sensor.

The temperature is by default shown in degrees Celsius, but you can change this on the **Units** page in the **Installation** dialog box.

Distance read-out

The navigational information on the top bar may include a read-out of the vessel's sailed distance.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box 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.

The distance is by default shown in nautical miles, but you can change this on the **Units** page in the **Installation** dialog box.

Roll, Pitch and Heave read-outs

The navigational information on the top bar may include read-outs of the vessel's roll, pitch and heave movements.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box on the **Display** menu.



Description

If a suitable motion reference unit (MRU) sensor is connected to the EK80 Processor Unit, the top bar may show you the vessel's current movements.

The roll and pitch information is always shown in degrees.

Depth read-out

The current water depth may be shown on the top bar.

Prerequisites

In order to see this information, it must be enabled in the **Display Options** dialog box 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 is selected in the **Display Options** dialog box on the **Display** menu. The chosen channel is identified in the depth readout.

The depth is by default shown in meters, but you can change this on the **Units** page in the **Installation** dialog box.

Related topics

[Depth information pane, page 261](#)

Messages button

The **Messages** button is located on the right side of the top bar.

Description

By flashing, the **Messages** button shows you that the EK80 has issued a message.



The colour of the triangle reflects the severity of the message.

- **Yellow:** This indicates a warning
- **Read:** This indicates an alarm

Click the button to open the **Messages** dialog box.

Tip

If you place the mouse cursor over the button, the number of recent messages is shown.

Operating system function buttons

Four operating system function buttons are located on the right side of the top bar; **Help**, **Minimize**, **Maximize** and **Close**.

Help button

Click this button to open the EK80 on-line help. The button opens the help system on its start page.



On-line help is also available from the various dialog boxes in the EK80 user interface. Click the **Help** button [?] in the top right corner of a dialog box to open the help system.

Note

The on-line help may not be available in the language you have chosen for the user interface. By default, the English on-line help will then be used.

Minimize button

Click this button to minimize the EK80 presentation window. The program is then only shown as an icon on the operating system's task bar. To re-open, click the button one more time.



Maximize/Normalize button

Click this button to change the size of the EK80 presentation window. To restore the presentation to its previous size, click the button one more time.



Close button

Click this button to close the EK80 program.



Information panes

Topics

[History information pane, page 258](#)

[Colour Scale information pane, page 260](#)

[Depth information pane, page 261](#)

[Target Strength Histogram information pane, page 263](#)

[Target Position information pane, page 265](#)

[TS\(f\) information pane, page 266](#)

[Biomass information pane, page 268](#)

[Sv\(f\) information pane, page 270](#)

[Numerical information pane, page 272](#)

[Zoom information pane, page 278](#)

[Transceiver Power Supply information pane, page 280](#)

History information pane

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

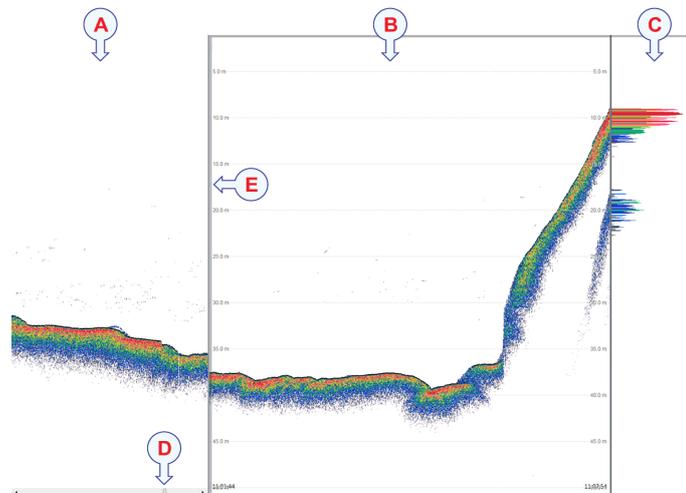
To open the *History* information pane, click the button on the top bar. A dedicated view on the left side of the echogram presentation opens to show you a history image.



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**

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.

The *History* function is made possible because the EK80 Processor Unit continuously saves echogram pictures in bitmap format to its internal hard disk. These can be recalled using this functionality. 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.

Related topics

[About the information panes, page 251](#)

Colour Scale information pane

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

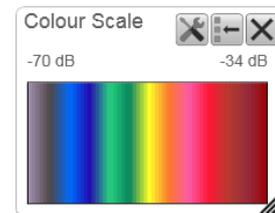
To open the *Colour Scale* information pane, click the button on the top bar.



To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.

Description

The *Colour Scale* information pane displays the current colour scale you are using for the EK80 presentations.



Additional functionality related to the colour scales is available.

- **Transparency**

When you open an information pane, you will see that it is transparent. The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened.

- **Colour Scale**

The **Colour Scale** dialog box allows you to change the echo level range presented by the current colour scale in the active view.

- **Colour Setup**

The **Colour Setup** dialog box allows you to select the presentation colours used by the EK80.

- **Status bar**

The current colour scale is shown on the status bar even when the *Colour Scale* information pane is closed.

In the **Colour Setup** dialog box, the following colour scales can be selected for echograms.

12 colours

Sonar colours

Echogram colours

Grayscale

BI500 colours



The **Echogram colours** scale is based on the standard 12-colour scale, but additional colours have been added between these to make smoother colour transitions.

In addition to these, a special color scale is available for sidescan presentations.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.



To change the transparency of the information pane use the **Transparency** function on the **View** menu.

**Details****Close**

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.

**Reset size**

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.

**Setup**

The **Setup** button opens the **Information Pane Options** dialog box.

**Related topics**

[About the information panes, page 251](#)

[Status bar, page 302](#)

[Information Pane Options dialog box, page 443](#)

[Colour Scale dialog box, page 445](#)

Depth information pane

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 the **Depth** button on the top bar.

To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.



Description

The depth is shown in the measuring unit that you have selected on the **Units** page in the **Installation** dialog box.



From the *Depth* information pane you can open the **Bottom Detection** page in the **Information Pane Options** dialog box. This page allows you to define the upper and lower depth limits for better bottom detection.

Tip

*If you have problems with bottom detection, you may consider disabling the function. This can be useful when you only wish to study targets in the water column. Use the dedicated option in the **Bottom Detection** dialog box.*

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

[About the information panes, page 251](#)

[Depth read-out, page 256](#)

[Information Pane Options dialog box, page 443](#)

[Bottom Detection dialog box, page 437](#)

Target Strength Histogram information pane

The *Target Strength Histogram* information pane shows you a histogram of the echoes detected from single fishes. The histogram presents the strength of the echoes (shown in dB).

How to open

To open the *Target Strength Histogram* information pane, click the icon on the top bar.



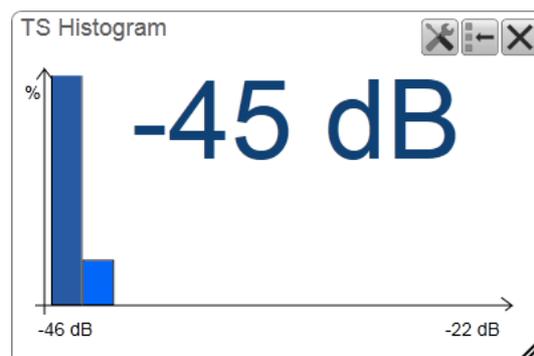
To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.

Prerequisites

The *Target Strength Histogram* information pane is only available if your EK80 is equipped with one or more split beam transducers.

Description

The *Target Strength Histogram* information pane shows a histogram of the single fish echoes that are detected. The calculation is based on the parameters you have selected in the **Calculation Interval** dialog box; time, ping or a chosen part of the current view. It thus provides a visual indication on how large the fishes are within the chosen interval.



Only the fishes detected by the currently active view/channel (transceiver/transducer combination) are shown.

The target strength shown with the large number is an average value. For an accurate X-axis value, place the cursor on a vertical bar in the histogram, and read the value from the tooltip label.

The target strength from a fish varies from specie to specie. To change the fish species, use the **Fish Select** dialog box opened from the **Setup** menu.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.



The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.

Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.



This button allows you to reset the pane to its original size.

Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

- [About the information panes, page 251](#)
- [Information Pane Options dialog box, page 443](#)
- [TS Histogram page, page 448](#)
- [Single Target Detection dialog box, page 440](#)

Target Position information pane

The *Target Position* information pane shows the position of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles). The view is "from above". The colours indicate the echo strength.

How to open

To open the *Target Position* information pane, click the icon on the top bar.



To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.

Prerequisites

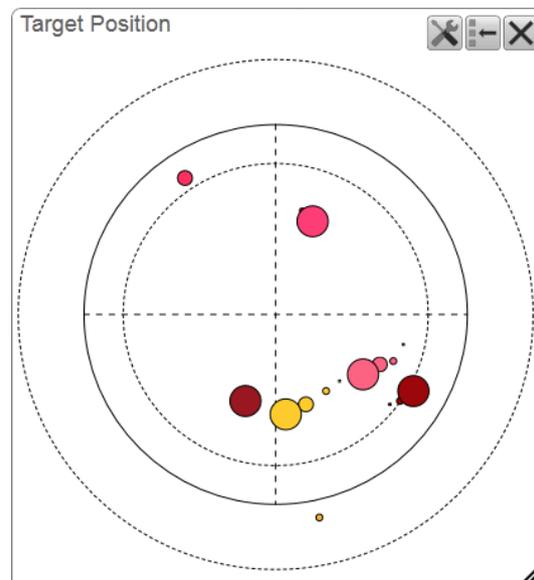
The *Target Position* information pane is only available if your EK80 is equipped with one or more split beam transducers.

Description

Each circle in the information pane identifies a single target (fish), and 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 target.

To adjust the parameters for single target detection, use the **Single Target Detection** dialog box on the **Active** menu, or the **Single Target Detection** page in the **Information Pane Options** dialog box.



Tip

If you open the Target Position information pane next to the TS(f) information pane, you will see that each target (fish) in one information pane is also shown in the other using the same colour code for echo strength.

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 lower frequency in the sweep, while the outer dotted circle identifies the upper frequency. The circle between them identifies the centre frequency.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

- [About the information panes, page 251](#)
- [Information Pane Options dialog box, page 443](#)
- [Single Target Detection dialog box, page 440](#)

TS(f) information pane

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.

How to open

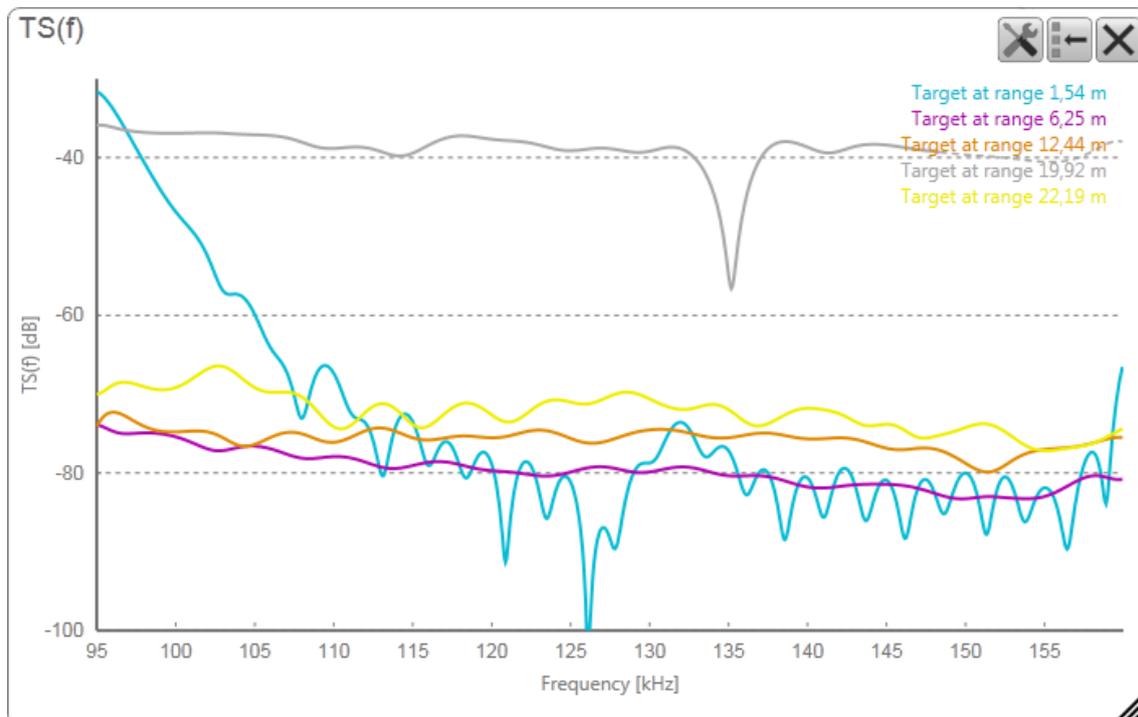
To open the *TS(f)* information pane, click the **TF(s)** button on the top bar.

To *close* the information pane, click the button one more time. You can also click the **Close** button in the top right corner of the pane.



Prerequisites

The *TS(f)* information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.



Description

The $TS(f)$ information pane is a plot showing how echo strength for individual targets are changing with the operational frequency.

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.

The $TS(f)$ information 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.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

[About the information panes, page 251](#)

[Information Pane Options dialog box, page 443](#)

[TS\(f\) page, page 449](#)

Biomass information pane

The *Biomass* information pane displays an index of the biomass in the current echogram view. The biomass index is the same as the NASC (Nautical area scattering strength) with unit m^2/nmi^2 .

How to open

To open the *Biomass* information pane, click the button on the top bar.

To *close* the information pane, click this button one more time. You can also click the **Close** button 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.

Note

If you have other echo sounders or sonars running asynchronous with the EK80, these systems may cause interference. The EK80 may then measure the transmit pulse from the secondary system(s), and this will have an effect on the biomass readings. To avoid 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 **Setup** button opens the **Information Pane Options** dialog box.

Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

[About the information panes, page 251](#)

[Information Pane Options dialog box, page 443](#)

[Calculation Interval dialog box, page 381](#)

Sv(f) information pane

The *Sv(f)* information pane shows you the volume backscatter as a function of the frequency.

How to open

To open the *Sv(f)* information pane, click the **Sv(s)** button on the top bar.



To *close* the information pane, click the button one more time. You can also click the **Close** button in the top right corner of the pane.

Prerequisites

The *Sv(f)* information pane can only be opened when the EK80 operates with FM ("chirp") transmissions.

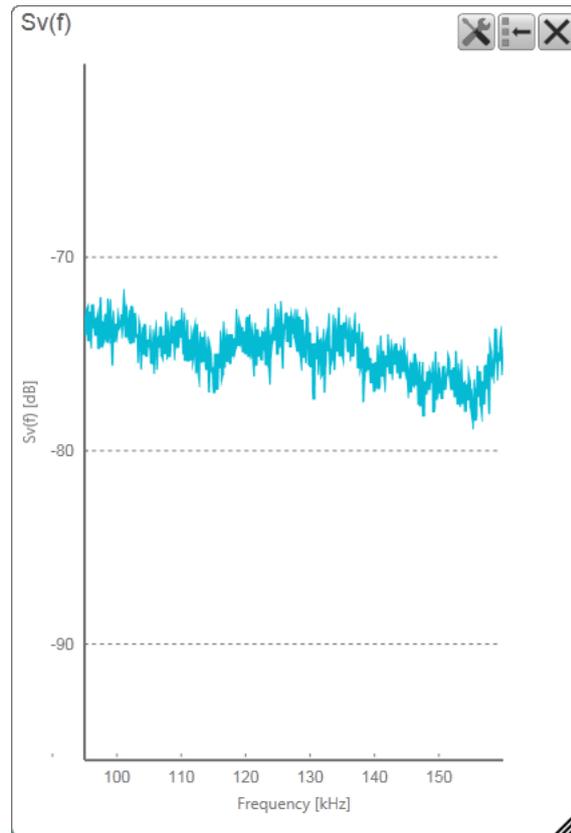
Description

The $S_v(f)$ information pane is a plot showing the how echo strength for a group of targets (for example a school of fish) are changing with the operational frequency.

The $S_v(f)$ information 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 open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Setup

The **Setup** button opens the **Information Pane Options** dialog box.



Related topics

[About the information panes, page 251](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Information Pane Options dialog box, page 443](#)

[Sv\(f\) page, page 449](#)

Numerical information pane

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 the **Numerical** button on the top bar.



To *close* the information pane, click the button one more time. You can also click the **Close** button in the top right corner of the pane.

Description

The information in the *Numerical* information pane is organized in lists. Each list can be opened or closed using the small triangle on the left side.

The following lists are available:

- **Transducer**

The **Transducer** list in the *Numerical* information pane contains information related to the transducer in use on the relevant echogram channel.

- **Environment**

The **Environment** list in the *Numerical* information pane contains information related to the environment for the relevant echogram channel.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Topics

[Numerical information pane - Transducer list, page 274](#)

[Numerical information pane - Environment list, page 275](#)

[Numerical information pane - Background layer list, page 276](#)

[Numerical information pane - Layer N list, page 277](#)

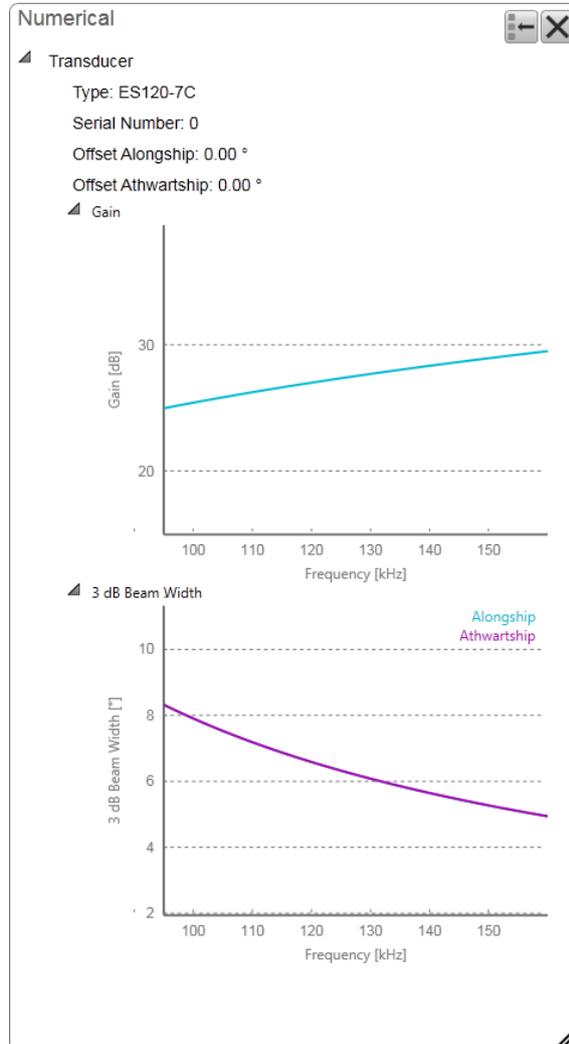
Numerical information pane - Transducer list

The **Transducer** list in the *Numerical* information pane contains information related to the transducer in use on the relevant echogram channel.

Description

The following information is provided in the **Transducer** list.

- **Type**
This identifies the transducer type in use on the current channel.
- **Serial number**
This identifies 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 on the **Transducer** page in the **Installation** dialog box.
- **Offset**
Alongship and athwartship offsets are shown. These offset angles are taken from the calibration.
- **Gain (curve)**
This curve shows the transducer gain (in dB) for different operational frequencies.
- **3 dB Beam width (curve)**
This curve shows the transducer beam width (in degrees) for different operational frequencies.



Numerical information pane - Environment list

The **Environment** list in the *Numerical* information pane contains information related to the environment for the relevant echogram channel.

Description

The following information is provided in the **Environment** list.

- **Temperature**

This is the current water temperature. It reflects the temperature you have provided in the **Environment** dialog box.

- **Salinity**

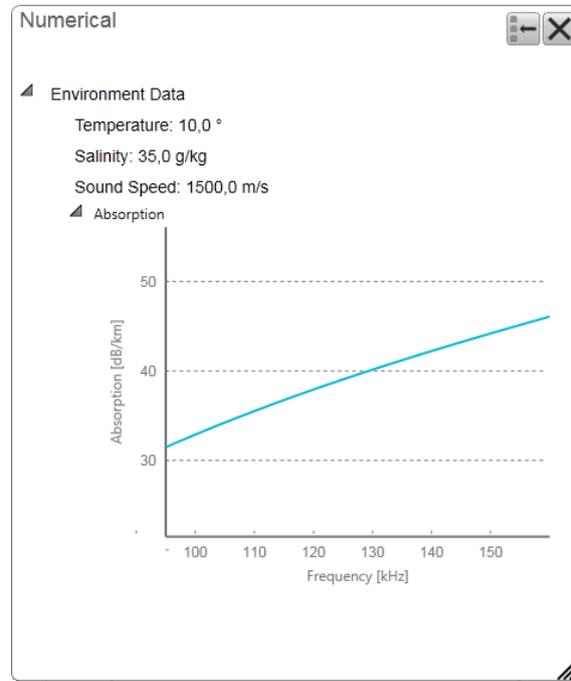
This is the current water salinity. It reflects the salinity you have provided in the **Environment** dialog box.

- **Sound speed**

This is the sound speed calculated by the EK80.

- **Absorption (curve)**

The absorption curve is drawn based on calculations made by the EK80.



Related topics

[Environment dialog box, page 377](#)

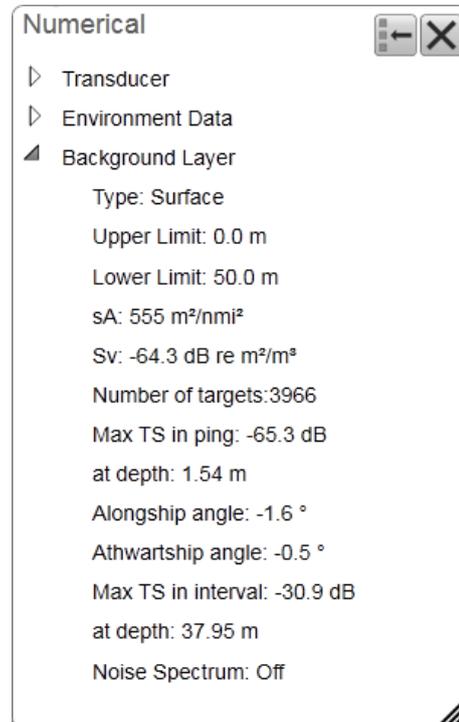
Numerical information pane - Background layer list

The **Background Layer** list in the *Numerical* information pane 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.

- **Type**
This identifies the echogram type in use.
- **Upper and Lower Limits**
These parameters identify the depth range that the layer covers.
- **sA**
This is the current biomass index. It is provided as NASC (Nautical area scattering strength) value with unit m^2/nmi^2 .
- **Sv**
This number (in $\text{dB re m}^2/\text{m}^3$) identifies the total volume backscatter in the depth layer.
- **Number of targets**
This number 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 and athwartship angles**
These parameters identify the alongship and athwartship offsets for the transducer. These offset angles are taken from the calibration.
- **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.



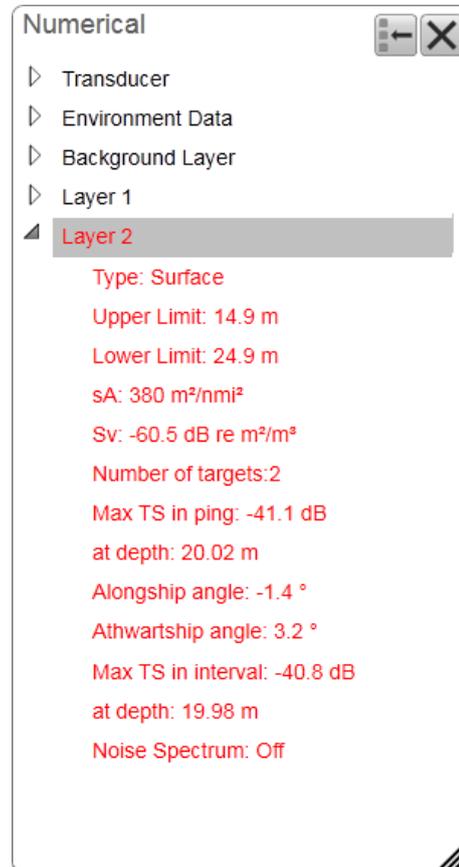
Numerical information pane - Layer N list

The **Layer N** list in the *Numerical* information pane contains acoustic data related to the specific layer N. This layer covers the range you defined in the **New Layer** dialog box. When the layer is "active" the data in the pane is shown with red colour.

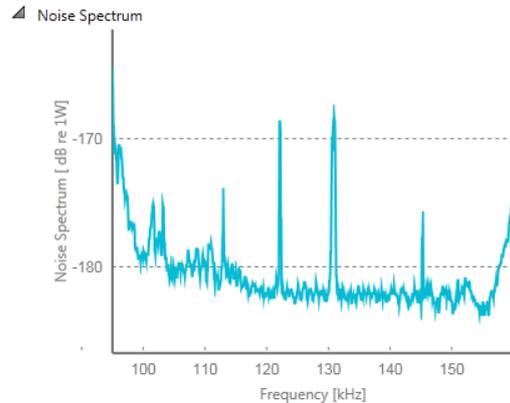
Description

The following information is provided in the **Layer N** list.

- **Type**
This identifies the echogram type in use.
- **Upper and Lower Limits**
These parameters identify the depth range that the layer covers.
- **sA**
This is the current biomass index. It is provided as NASC (Nautical area scattering strength) value with unit m^2/nmi^2 .
- **Sv**
This number (in $\text{dB re m}^2/\text{m}^3$) identifies the total volume backscatter in the depth layer.
- **Number of targets**
This number 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 and athwartship angles**
These parameters identify the alongship and athwartship offsets for the transducer. These offset angles are taken from the calibration.
- **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 will display 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.

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** on the **Active** menu.*

Zoom information pane

The *Zoom* information pane allows you to zoom in on a chosen area in the current echogram.

How to open

To open the *Zoom* information pane, click the icon on the top bar.



To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.

Description

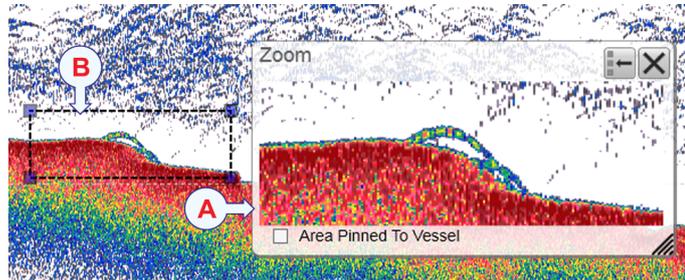
Once the *Zoom* information pane is opened, the zoomed area is visible as a dotted rectangle in the echogram. You can change the size of this zoomed area, and you can move the rectangle anywhere inside the active echogram view.

- If you click inside the rectangle, you can move it.
- If you click on any of the four corners, and hold the mouse button depressed, you can drag it to any size and shape.

The echoes inside the zoomed area will always be shown in the *Zoom* information pane.

Use the **Area Fixed To Vessel** option to control the behaviour of the zoomed area.

- 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.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.



To change the transparency of the information pane use the **Transparency** function on the **View** menu.



Details

Close

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.



Reset size

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.



Area Fixed to Vessel

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 will then shift through the area, and thus 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.

Related topics

[About the information panes, page 251](#)

Transceiver Power Supply information pane

The *Transceiver Power Supply* information pane shows you the current supply voltage to the Wide Band Transceiver (WBT).

How to open

To open the *Transceiver Power Supply* information pane, click the icon on the top bar.

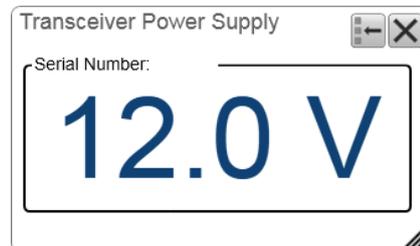


To *close* the information pane, click this button one more time. You can also click the **Close** button in the top right corner of the pane.

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. You will have one information pane for each transceiver in use on your EK80 system.



- 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.

In order to open an information pane, you must first click in an echogram presentation to make it "active". By doing this you select the frequency channel (transceiver/transducer combination). In most cases, the data in the information pane you open will only be valid for the selected echogram and frequency channel.

Tip

*You can easily change the size and shape of each information pane by clicking in its lower right corner and drag to a new size. To reset the pane to its default size, click the **Reset size** button in its top right corner.*



To change the transparency of the information pane use the **Transparency** function on the **View** menu.

**Details****Close**

Click this button to close the information pane.

The pane closes immediately. If you wish to reopen it, simply click the icon on the top bar one more time.

**Reset size**

You can easily change the size and shape of the information pane by clicking in its lower right corner and drag to a new size.

This button allows you to reset the pane to its original size.

**Related topics**

[About the information panes, page 251](#)

Echogram views

Topics

[About the echogram views, page 282](#)

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

[Trawl echogram view, page 291](#)

About the echogram views

The status bar at the bottom of the EK80 presentation allows you to choose which channels to open. Each channel is opened in an echogram view. In each view, you can choose which echogram type you wish to see.

The number of tabs available on the status bar depends on how many channels your EK80 has. There are two tab groups that you can use to select channels and views. This example shows the EK80 with three channels.



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.

Once the views are automatically arranged in the chosen presentation, you can click and drag the borders on the individual views to change the size of the rectangles. Please note that by increasing the size of one view, the others will be smaller.

Note

*The **Vertical** and **Horizontal** tabs will only be shown if you have two or more transducers.*

*The **Square** tab will only be shown if you have three or more transducers.*

B Selecting individual echogram channels

Each channel (transceiver/transducer combination) is shown with a dedicated tab. The channel is identified with the name of the transducer in use. In many cases, this name will also include the operational frequency.

Click on a specific transducer tab to see only that channel in the EK80 presentation.

Once a number of echogram views are opened, you can choose which echogram type to see.

To choose echogram type, click in the view to make it "active". Then, 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.

Tip

If you use the tabs on the status bar to arrange your views, all will have the same size. You can also click on any view border, and drag the border in horizontal or vertical direction to change the size of the view.

*To make more room for the views, you can also hide the menu. Use the **Menu** button on the top bar.*



Surface echogram view

The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

How to open

To activate surface echogram, click in the chosen view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Echogram** page, set **Echogram type** to *Surface*.

Description

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

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

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, you can use the Zoom information pane to enlarge echoes from the water column or the bottom.



To choose this echogram type, select **Echogram Type** on the **Echogram** page in the **Echogram** dialog box. The **Echogram** dialog box is opened from the **Active** menu.



A This is the start depth of the echogram

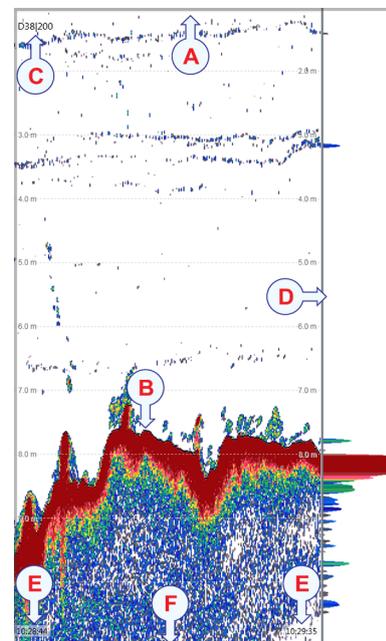
In a bottom echogram you will probably wish to start the echogram from a fixed distance above the bottom. To do this, you must set the **Start Range** to a negative value, for example **-10 m**. This negative value defines how many meters above the bottom the echogram will start.

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 bottom, it will be shown as a flat contour. If you increase the **Start Range** value to include the sea surface, you will see that this surface 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).



Tip

*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.

D This is the scope view

This view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E Label

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

This information can be changed using the **Label** options on the **Horizontal Axis** page in the **Echogram** dialog box.

The following label options are available:

- **None:** Both 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).

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 0 meters. 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 meters. The echogram will now show the area from the sea surface and down to 20 meters "below" the bottom. The bottom contour is easily detected when the depth changes.

Related topics[Bottom line, page 295](#)[White line, page 296](#)[Trawl line, page 297](#)[Range scales, page 298](#)[Vertical ticks, page 298](#)[Annotation markers, page 299](#)[Labels, page 300](#)

Bottom echogram view

The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

How to open

To activate a bottom echogram, click in the chosen view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Echogram** page, set **Echogram type** to *Bottom*.

Description

A *Bottom echogram* view is mainly used when you wish to examine the echoes from fish close to the bottom. Since this echogram is referenced to the bottom, the sea surface will vary with the actual depth. If you set up the **Start Range** and **Range** depths to hide the surface and place the bottom contour at the middle of the echogram, you will have good opportunity to study these echoes.

Note

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

Keep in mind that since the *Bottom echogram* view 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** defines the vertical range from the start depth and down.

Tip

For closer investigation, you can use the Zoom information pane to enlarge the echoes from the bottom.



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.

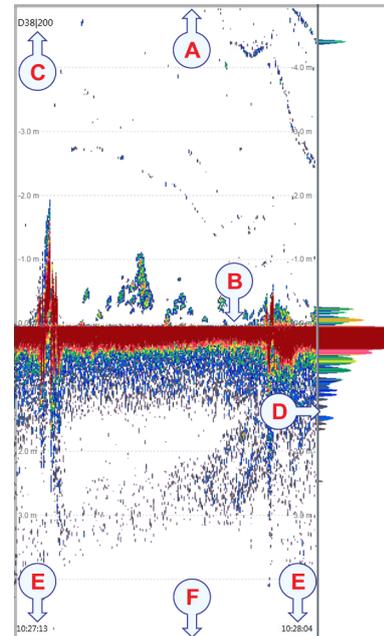
B This is the bottom (seabed)

The bottom is shown with a strong contour. Since the echogram is referenced to the bottom, it will be shown as a flat contour. If you increase the **Start Range** value to include the sea surface, you will see that this surface 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).

Tip

*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.

D This is the scope view

This view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E Label

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

This information can be changed using the **Label** options on the **Horizontal Axis** page in the **Echogram** dialog box.

The following label options are available:

- **None:** Both 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).

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

Related topics

[Bottom line, page 295](#)

[White line, page 296](#)

[Trawl line, page 297](#)

[Range scales, page 298](#)

[Vertical ticks, page 298](#)

[Annotation markers, page 299](#)

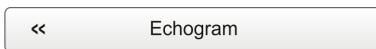
[Labels, page 300](#)

Surface echogram view

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

How to open

To activate a pelagic echogram, click in the chosen view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Echogram** page, set **Echogram type** to *Pelagic*.

Description

A *Pelagic echogram* view 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 depth. The **Range** depth must then be chosen to make the echogram stop somewhere *over* the bottom contour. This will give 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.

Tip

For closer investigation, you can 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.

D This is the scope view

This view is used to indicate how strong each echo is. The colour and the length of each line reflects the received echo amplitude.

E Label

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

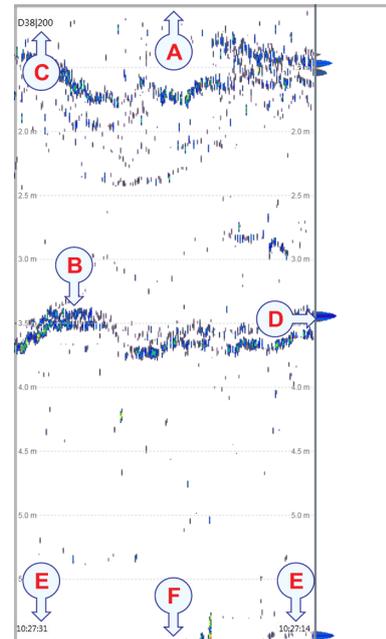
This information can be changed using the **Label** options on the **Horizontal Axis** page in the **Echogram** dialog box.

The following label options are available:

- **None:** Both 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).

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

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.

Related topics

[Bottom line, page 295](#)

[White line, page 296](#)

[Trawl line, page 297](#)

[Range scales, page 298](#)

[Vertical ticks, page 298](#)

[Annotation markers, page 299](#)

[Labels, page 300](#)

Trawl echogram view

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

How to open

To activate a trawl echogram, click in the chosen view to make it "active". Then, open the **Active** menu and click **Echogram**.



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 from these sensors are drawn as horizontal lines on the EK80 echogram.

This information is required for the trawl echogram to be generated. Without the depth of the headrope, the echogram will appear like a standard pelagic echogram controlled by the **Range** and **Start Range** settings.

The distance from the headrope to the footrope (trawl opening) can be manually set on the **Trawl** page in the **Installation** dialog box. This is useful for trawl sensor systems that do not measure the trawl opening, or when the measured distance is unreliable.

The **Trawl** page also allows you to enter the distance from the vessel to the trawl opening. The depth of the headrope must however be provided by the catch monitoring system.

Note

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

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, you can 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 short vertical markers are used to identify elapsed time or distance. You can switch these on or off on the **Lines** page in the **Echogram** dialog box.

C Transducer identification

This text identifies the transducer - and thus also the channel - used to create the echogram.

D Range scales

When enabled, equidistant horizontal scale lines are drawn inside the echogram in the current foreground colour; black during day and white during night.

You can switch these on or off on the **Lines** page in the **Echogram** dialog box.

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 from these sensors are drawn as horizontal lines on the EK80 echogram.

You can switch these on or off on the **Lines** page in the **Echogram** dialog box.

F This is the bottom (seabed)

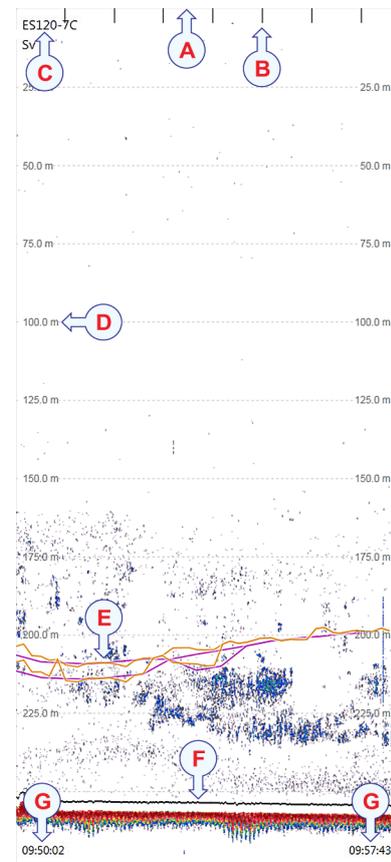
The bottom is shown with a strong contour. Since the echogram is referenced to the sea surface, the bottom will vary with the actual depth.

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).

Tip

*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".*

In this example, both are used.



G Label

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

This information can be changed using the **Label** options on the **Horizontal Axis** page in the **Echogram** dialog box.

The following label options are available:

- **None:** Both 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).

Related topics

[Bottom line, page 295](#)

[White line, page 296](#)

[Trawl line, page 297](#)

[Range scales, page 298](#)

[Vertical ticks, page 298](#)

[Annotation markers, page 299](#)

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Echogram markers

Topics

[Bottom line, page 295](#)

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[Range scales, page 298](#)

[Vertical ticks, page 298](#)

[Annotation markers, page 299](#)

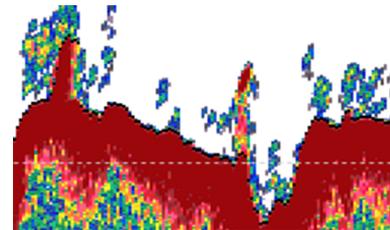
[Labels, page 300](#)

Bottom line

The bottom line adds an extra black line to your bottom contour.

How to open

To activate the bottom line, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Lines** page, enable the line.

Description

The 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.

The bottom line can be switched on or off. It can be combined with the white line.

Related topics

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

[Trawl echogram view, page 291](#)

White line

The white line is an extra thick white line that is added to just below the bottom.

How to open

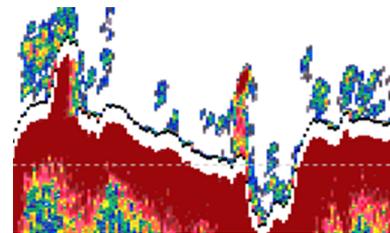
To activate the white line, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Lines** page, enable the line.

Description

The 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 line and the bottom line simultaneously.

Related topics

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

[Trawl echogram view, page 291](#)

Trawl line

The trawl line function is used to show you where the headrope and/or footrope of your trawl is located.

How to open

To activate the trawl line, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



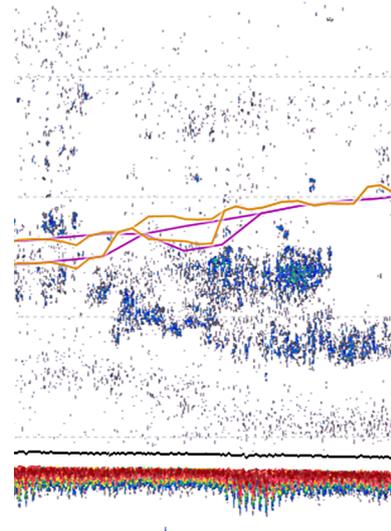
On the **Lines** page, enable the line.

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 from these sensors are drawn as horizontal lines on the EK80 echogram.

Manual trawl parameters can be entered using the **Trawl** page in the **Installation** dialog box.

This is useful for trawl sensor systems not measuring 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.



Related topics

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

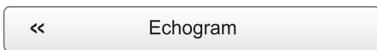
[Trawl echogram view, page 291](#)

Range scales

In order to estimate the depth, you can enable depth scale lines. These are a chosen number of horizontal lines in your echogram view, each representing a certain depth.

How to open

To activate the range scale, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



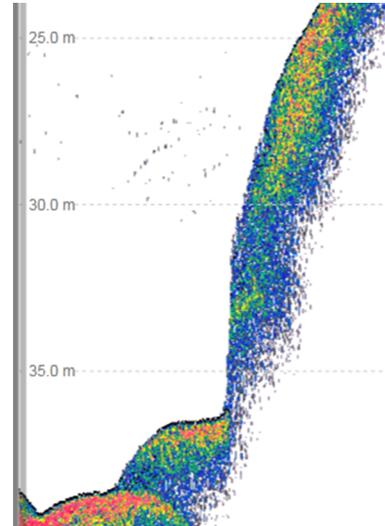
On the **Lines** page, select how many scale lines you wish to use.

Description

When enabled, equidistant horizontal scale lines are drawn inside the echogram in the current foreground colour; black during day and white during night.

No scale lines are drawn when the scale line count is set to 0 (zero).

A maximum of 10 scale lines can be selected.



Related topics

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

[Trawl echogram view, page 291](#)

Vertical ticks

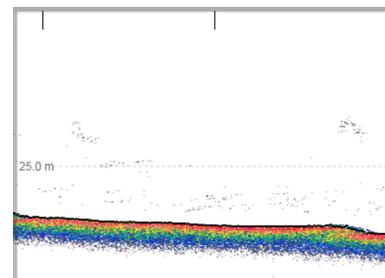
In order to create a horizontal scale, you can add vertical ticks to your echogram. These are small vertical lines that appear at the top of your echogram.

How to open

To activate the vertical ticks, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Lines** page, select which ticks to use.



Description

When enabled, this function places vertical markers on the echogram.

- **None**
No vertical markers are shown.
- **Time**
This option places a short vertical line in the upper part of the echogram once every specified number of minutes.
- **Distance**
This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of 1/10 nautical miles.

Related topics

[Surface echogram view, page 283](#)

[Bottom echogram view, page 286](#)

[Surface echogram view, page 289](#)

[Trawl echogram view, page 291](#)

Annotation markers

Annotations may be added to the echogram to identify special echoes or special events.

How to open

To enable the annotation markers, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



On the **Lines** page, choose which annotation markers you wish to see.

Description

Select *Text* or *Line* to allow annotations to be displayed in the echogram view. If you select *Line*, the text annotation will be followed by a vertical line for improved visibility.



An annotation can be entered manually using the **Annotation** page in the **Installation** dialog box, or they can be imported from a peripheral device.

Several different annotation types may be added to the echogram. The annotations defined are stored with the raw data as annotation datagrams. They are displayed on the echogram if this feature is enabled in the **Echogram** dialog box.

Note

Annotations can only be added to the echogram while in Normal operational mode.

Related topics

- [Surface echogram view, page 283](#)
- [Bottom echogram view, page 286](#)
- [Surface echogram view, page 289](#)
- [Trawl echogram view, page 291](#)

Labels

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

How to open

To activate the labels, click in the echogram view to make it "active". Then, open the **Active** menu and click **Echogram**.



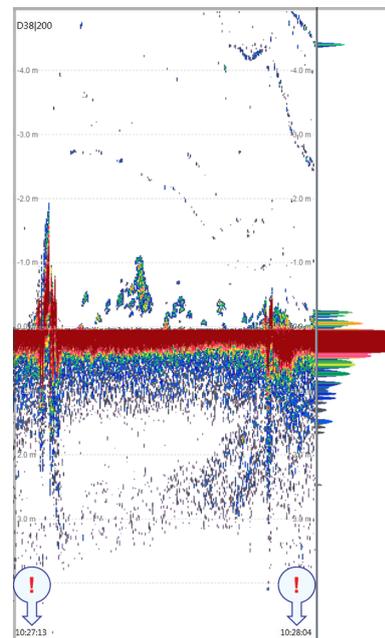
On the **Horizontal axis** page, choose which labels you wish to use.

Description

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

The following label options are available:

- **None:** Both 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).



Related topics

- [Surface echogram view, page 283](#)
- [Bottom echogram view, page 286](#)
- [Surface echogram view, page 289](#)
- [Trawl echogram view, page 291](#)

The EK80 menu system

The menu system is by default located on the right hand side of the EK80 presentation.

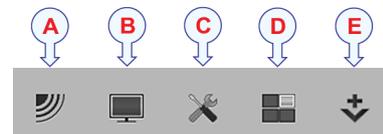
To change operational settings in the EK80, use the tree structure. It offers a main menu, a set of submenus, and several menu buttons. Some of the menu buttons open dialog boxes or sub-menus to present additional parameters.



The **Main** menu offers the settings most frequently used during normal operation.

Below the main menu, a set of dedicated icons are used to open the secondary menus. These are (from left):

- 1 The **Operation** menu controls the main operational parameters.
- 2 The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation
- 3 The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- 4 The **Active** menu has its content linked to the current active view. Use it to access special features available for the selected view.
- 5 The **Extras** menu is not a menu at all, but a small pane offering key transmission parameters related to the currently active view.



Tip

*You can hide the menu from view if you do not need it. Click the **Menu** button on the top bar to hide the menu, and click one more time to retrieve it. When the menu is hidden, it will automatically reappear on the left or right side of the EK80 presentation if you move your mouse cursor to one of those positions.*



Related topics

[EK80 screen layout, page 246](#)

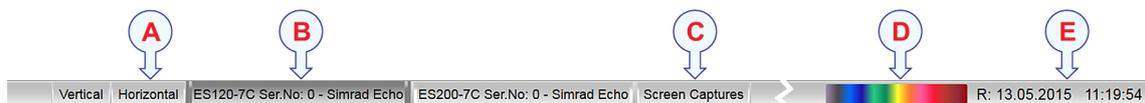
[Menu button, page 249](#)

Status bar

The status bar is located at the bottom of the EK80 presentation. It allows you to choose presentation mode, and review the screen captures you have made. It also shows you the current colour scale in use, as well as time and date.

How to open

The status bar is available all the time.



Description

The layout and content of the status bar will differ depending on the number of channels (transducer/transceiver combinations) you have on your EK80.

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.

Once the views are automatically arranged in the chosen presentation, you can click and drag the borders on the individual views to change the size of the rectangles. Please note that by increasing the size of one view, the others will be smaller.

Note

*The **Vertical** and **Horizontal** tabs will only be shown if you have two or more transducers.*

*The **Square** tab will only be shown if you have three or more transducers.*

B Selecting individual echogram channels

Each channel (transceiver/transducer combination) is shown with a dedicated tab. The channel is identified with the name of the transducer in use. In many cases, this name will also include the operational frequency.

Click on a specific transducer tab to see only that channel in the EK80 presentation.

C Screen captures

You can use the **Screen Capture** button on the top bar to save echograms as picture files on *.jpg format. The **Screen Captures** tab on the status bar opens a viewer that allows you to open these images. You can also open the file folder on the Processor Unit harddisk to copy, rename or delete the image files.



D Colour scale

The colour scale on the status bar reflects the colour choice you have made for the echograms. To change the colour scale, use the **Colour Setup** dialog box on the **Display** menu.



You can also change the colour parameters in the *Colour Scale* information pane.

E Date and Time

The current date and time is shown on the right side of the status bar.

Note

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.

Related topics

[EK80 screen layout, page 246](#)

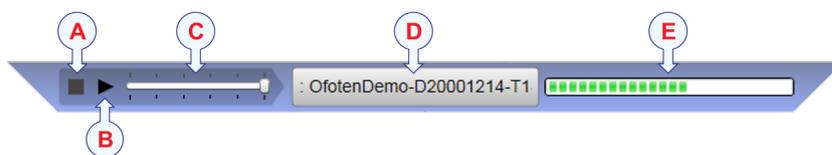
[Colour Scale information pane, page 260](#)

Replay bar

The replay bar is positioned directly below the top bar in the EK80 presentation. It is automatically opened once you select *Replay* operational mode.

Description

All playback is controlled by the replay bar.

**A Stop**

Click this button to stop the playback.

Note that the replay bar will not be removed from the presentation until you select another operational mode.

B Play/Pause

Click this button to start the playback, or to pause it.

C Replay speed

Click this slider and move it sideways to adjust the replay speed.

D Select playback file

This button shows which file you are currently playing, Click the button to open the **Replay File** dialog box.

E Progress

This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the green indicators will start from left every time the start of the file appears.

Note

*To start Replay operational mode, use the **Operation** button on the **Operation** menu.*

*If you wish your playback file to run continuously, click **Loop** in the **Replay File** dialog box.*

Depth layers in the echogram views

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 echo data collected within a specific depth range in the water column.

By default, a background layer will collect 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 will be 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

This is 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.

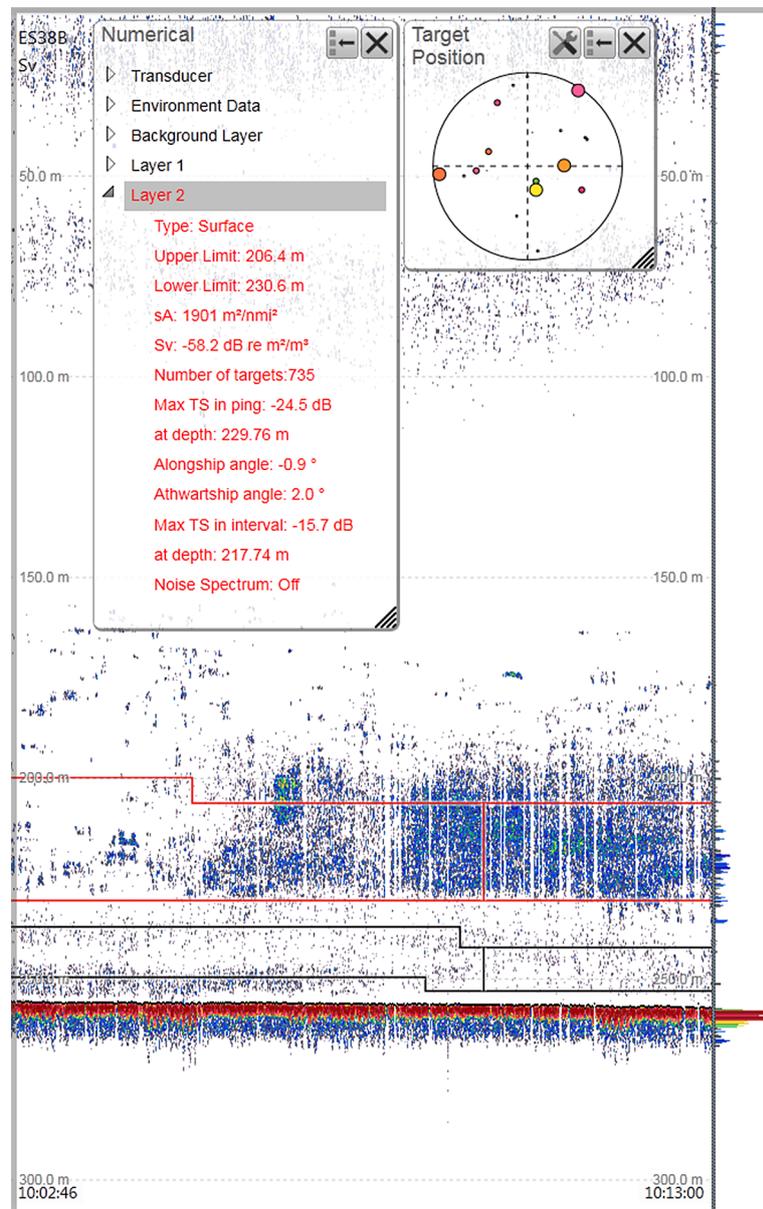
By default, any layer you create will be applied to all echogram views simultaneously.

To work with layers, the following options are available:

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

Note

All information shown in your information panes will reflect the echo data from 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 to identify the start of each calculation interval.

- 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** on the **Active** menu.

Note

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.

Related topics

[Numerical information pane, page 272](#)

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

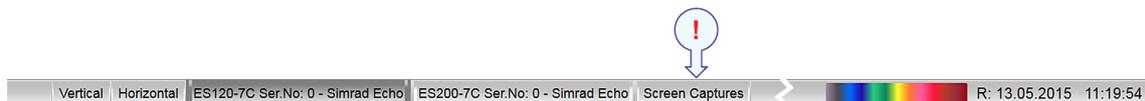
[Delete Layer function, page 436](#)

Screen capture browser

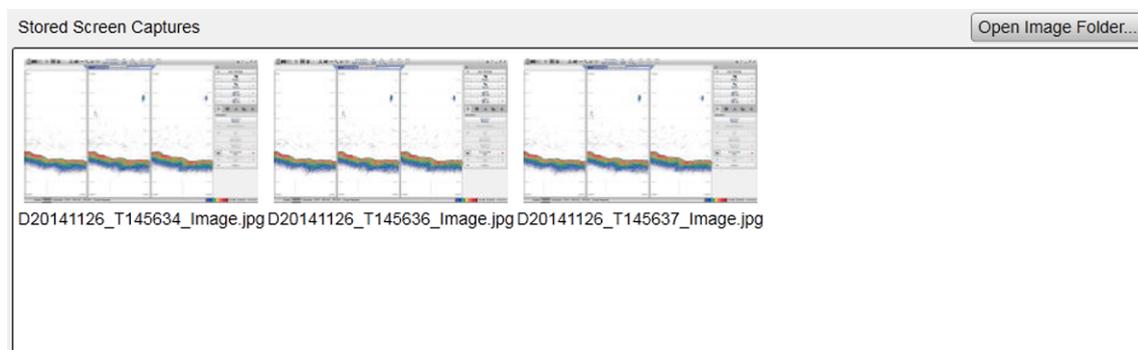
The EK80 provides a built-in screen capture function to create snapshots of the echogram presentation. The EK80 also provides a dedicated browser to view the saved images.

How to open

To open the screen capture browser, click the **Screen Captures** tab on the status bar.



To close the browser, click any of the other tabs on the status 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 all standard bitmap editors. The file names are created automatically using the date and time you clicked the **Screen Capture** button.

Double-click a miniature image to open it. Once opened, click **Return to Browser** to return to the browser view.

In the browser, click **Open Image Folder** to open the operating system folder containing the files. This folder offers operating system functionality to provide renaming, copying, printing and deleting files.

Tip

*To make a screen capture, click the **Screen Capture** button on the top bar.*

Every time you click this button, a new screen capture file is created.



Related topics

[Screen capture, Record and Event buttons, page 250](#)

Menu system

Topics

[About the menu system, page 309](#)

[Button types, page 309](#)

[Main menu, page 311](#)

[Operation menu, page 312](#)

[Display menu, page 315](#)

[Main menu, page 316](#)

[Active menu, page 318](#)

[Extras menu, page 320](#)

About the menu system

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 sub-menus to offer additional choices.

The **Main** menu offers the settings most frequently used during normal operation.

Below the main menu, a set of dedicated icons are used to open the secondary menus. These are (from left):

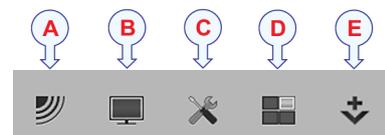
A The **Operation** menu controls the main operational parameters.

B The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation

C The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.

D The **Active** menu has its content linked to the current active view. Use it to access special features available for the selected view.

E The **Extras** menu is not a menu at all, but a small pane offering key transmission parameters related to the currently active view.



Tip

*You can hide the menu from view if you do not need it. Click the **Menu** button on the **Top bar** to hide the menu, and click one more time to retrieve it. When the menu is hidden, it will automatically reappear on the left or right side of the EK80 presentation if you move your mouse cursor to one of those positions.*



*The text in the menu buttons can be changed to suit your language preference by clicking **Language** on the **Setup** menu.*

*You can also place the menu on the left side of the EK80 presentation by de-selecting **Menu on the right side** in the **Display Options** dialog box.*

Button types

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.

A You can increase and decrease parameter values by clicking the **[+]** and **[-]** fields on the button.

B You can change parameter values by clicking on the button, holding the mouse depressed, and then moving the cursor sideways.

- C You can change parameter values by means of the scroll wheel on the mouse or trackball.
- D You can enter parameter values from the keyboard (if you have one).
- E You can select parameter value from the button's submenu.
- F You can open a dedicated dialog box.

Selecting a numerical parameter using the +/- buttons



- 1 Move the cursor to either side of the button.
- 2 Observe that the background colour changes.
 - a Click on the **left** side of the button to decrease the numerical value.
 - b Click on the **right** side of the button to increase the numerical value.

Selecting a numerical parameter by moving the cursor horizontally



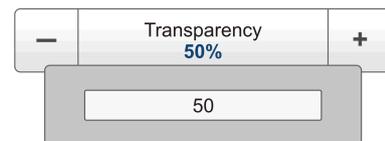
- 1 Place the cursor on the middle of the button.
- 2 Click and hold the **left** mouse button depressed.
- 3 Move the cursor horizontally: left to decrease the value, or right to increase it.
- 4 Release the mouse button when the requested value is shown.

Selecting a numerical parameter by means of the scroll wheel



- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the value.
- 3 Release the scroll wheel when the requested value is shown.

Selecting a numerical parameter using the keyboard



- 1 Click the middle section of the button to open a text field.
- 2 Type the numerical value into the text field.
If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red.
- 3 Press the **Enter** key.

Selecting a parameter using a submenu

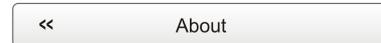


- 1 Click the middle section of the button to open a submenu, then click the requested command, option or button.
The chosen value is applied, and the submenu is automatically closed.
- 2 Whenever applicable, you can also access the submenu by clicking the left and right side of the button. This method will not show you the choices on the submenu.

- Click on the **left** side of the button to select a 'lower' submenu choice.
- Click on the **right** side of the button to select a 'higher' submenu choice.

Selecting parameters using a dialog box

- Click anywhere on the button to open a separate dialog box.



Main menu

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

How to open

On the top bar, click once on the **Menu** button to hide the menu, and one more time to bring it back again. When the **Menu** is hidden, it will temporarily be shown on the left or right hand side of the display if you move the cursor to that position.



Description

- **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.

- **Range**

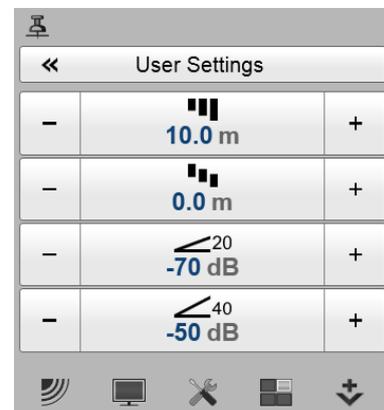
The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.

- **Start Range**

The **Start Range** function allows you to specify the start depth of the echogram; that is from which depth in the water column the presentation shall start. The value shown and selected is applied only to the currently selected echogram type.

- **Gain**

The purpose of the **Gain** function is to adjust the echo level in the EK80 presentations. In other words, it controls how much amplification that is applied to the received echoes. Note that the selected gain is by default only applied to the active view.



Tip

For detailed information about every function, button and dialog box, refer to the EK80 Reference manual or the context sensitive on-line help.

Secondary menus

The bottom of the **Main** menu holds the icons to open (and close) the secondary menus. Click once on an icon to open the requested menu, and one more time to close it.

Hiding the menu

If you do not need to use the menu system, click once on the **Menu** button on the top bar. This will hide the menu. Click one more time to bring it back again. When the **Menu** is hidden, it will temporarily be shown on the left or right hand side of the EK80 presentation if you move the cursor to that position.



Related topics

[User Settings dialog box, page 324](#)

[Range function, page 326](#)

[Start Range function, page 327](#)

[Gain function, page 329](#)

Operation menu

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

How to open

Click once on the icon under the **Main** menu to open the **Operation** menu.

Click one more time on the icon to close the menu.



Note

Immediately after you have powered up the EK80 system, you will see that the menu icon is flashing. This is to remind you that the EK80 is currently passive.

*To start the EK80, you must set **Operation** to Normal and **Ping** to On.*

Description

1 Operation

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

2 Normal Operation

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It will also allow you to change these parameters.

3 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".

4 Ping Mode

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Interval*, and set the **Ping Interval** according to the survey requirements.

5 Ping Interval

The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function will then permit you to choose the time (in milliseconds) between each transmission ("ping").

6 Record RAW

The **Record RAW** function allows you to record the *unprocessed* echo data received by the transducer, and save them on the internal hard disk. The raw data files can later be copied or moved to other recordable media.

7 Record Processed

The **Record Processed** function allows you to record the *processed* echo data received by the transducer, and save them on the internal hard disk. The data files can later be copied or moved to other recordable media. Which processing to apply is controlled by the **Processed Data Output** parameters in the **Outputs** dialog box.

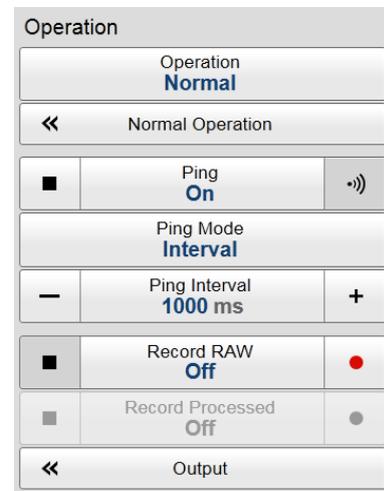
8 Output

The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location.

The following pages can be opened.

- **File Setup**

The purpose of the **File Setup** page is to define the file and folder properties for the RAW and Processed data files recorded with the EK80.



- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

- **Processed Data Output**

The purpose of the **Processed Data Output** page is to define which processed data formats to export, and where to place the files.

- **Depth Output**

The **Depth Output** parameters are used to set up the output of depth data from the EK80 using a dedicated communication port (serial or Ethernet) on the Processor Unit.

- **Relay Output**

The **Relay Output** parameters allow you to export the sensor data that was originally imported into the EK80 system. This sensor data includes navigational information, motion sensor data and sound velocity.

Related topics

[Operation function, page 333](#)

[Normal Operation dialog box, page 335](#)

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

[Record RAW function, page 342](#)

[Record Processed function, page 344](#)

[Output dialog box, page 346](#)

[File Setup page, page 348](#)

[I/O Setup page, page 349](#)

[Processed Data Output page, page 354](#)

[Depth Output page, page 356](#)

[Relay Output page, page 360](#)

Display menu

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

How to open

Click once on the icon under the **Main** menu to open the **Display** menu.

Click one more time on the icon to close the menu.



Description

1 Screen Brightness

The purpose of the **Screen Brightness** function is to adjust the intensity of the light given off by the display presentation.

2 Transparency

When you open an information pane, you will see that it is transparent. The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened.

3 Layout

The purpose of the **Layout** dialog box is to define which transducer channels you wish to see in the EK80 presentation. You can also position the echogram views in relation to each other.

4 Display Options

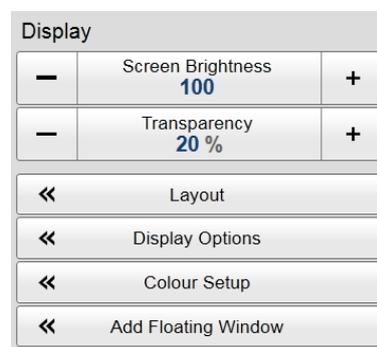
The **Display Options** dialog box allows you to control the location of the menu. It also controls which information you wish to see on the top bar and in the status bar.

5 Colour Setup

The **Colour Setup** dialog box allows you to select the presentation colours used by the EK80.

6 Add Floating Window

The **Add Floating Window** dialog box allows you to grab a complete echogram presentation for a chosen channel, and place it in a separate window. This window can for example be moved to a separate display on a Processor Unit using two or more displays.



Tip

For detailed information about every function, button and dialog box, refer to the EK80 Reference manual or the context sensitive on-line help.

Related topics

- [Screen Brightness function, page 364](#)
- [Transparency function, page 365](#)
- [Layout dialog box, page 365](#)
- [Display Options dialog box, page 367](#)
- [Colour Setup dialog box, page 370](#)
- [Add Floating Window dialog box, page 372](#)

Main menu

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

How to open

Click once on the icon under the **Main** menu to open the **Setup** menu.

Click one more time on the icon to close the menu.



Description

- **Environment**

The **Environment** dialog box allows you to adjust the parameters related to salinity, sound speed and water temperature.

- **Manual Annotation**

The **Manual Annotation** dialog box allows you to type a text string. Once you click **OK**, the text string is added to your echogram.

- **Calibration**

The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.

- **Calculation Interval**

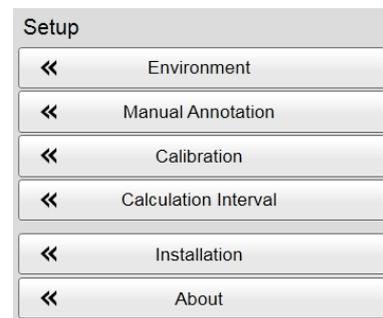
The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.

- **Installation**

The **Installation** dialog box allows you to control basic operational parameters related to EK80 installation and operation.

- **Transducer**

The **Transducer** page allows you to select the transducers you wish to use with your EK80 Scientific wide band echo sounder. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these.



- **Transceiver**

The purpose of the **Transceiver** parameters are to define the necessary settings to connect the Processor Unit to the transceiver(s) and the transducer(s).
- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.
- **Synchronization**

The purpose of the **Synchronization** parameters are 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.
- **Units**

The parameters on the **Units** page allow you to control the units of measurements used by the EK80.
- **Navigation**

The **Navigation** pages control how the EK80 receives information from external peripherals, such as positioning and/or gyro compass systems. The information provided by these systems are shown in the top bar.
- **Trawl**

The **Trawl** page allows you to enter the key parameters related to the trawl. The information is used to show the upper and lower trawl lines in the echogram.
- **Annotations**

The settings on the **Annotations** page allow you to type comments and annotations into the echograms.
- **Remote Control**

The **Remote Control** parameters allow you to set up the remote controlled operation of the EK80. The parameters define both how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this system.
- **Software License**

The purpose of the **Software License** page is to allow you to type the necessary license codes (text strings) to unlock the EK80 functionality.
- **About**

The **About** dialog box allows you to see the current EK80 software version.

Related topics

- [Environment dialog box, page 377](#)
- [Manual Annotation dialog box, page 379](#)
- [Calibration function, page 379](#)
- [Calculation Interval dialog box, page 381](#)
- [Installation dialog box, page 382](#)
- [Transducer page, page 384](#)
- [Transceiver page, page 386](#)
- [I/O Setup page, page 349](#)
- [Synchronization page, page 396](#)
- [Units page, page 398](#)
- [Navigation pages, page 399](#)
- [Trawl page, page 406](#)
- [Annotations page, page 407](#)
- [Remote Control pages, page 409](#)
- [Software License page, page 413](#)
- [About dialog box, page 415](#)

Active menu

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

How to open

Click once on the icon under the **Main** menu to open the **Active** menu.

Click one more time on the icon to close the menu.



Description

- **TVG**

The **TVG** (Time Variable Gain) function allows you to compensate the received data for loss due to geometric spread and absorption.

- **Echogram**

The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG (time varied gain), and how fast the echogram travels horizontally across the display.

- **New Layer**

The **New Layer** dialog box is used to insert a new depth layer.



- **Layer Properties**

The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer.

- **Delete Layer**

The **Delete Layer** function allows you to delete the currently selected ("active") depth layer.

- **Bottom Detection**

The purpose of the **Bottom Detection** parameters is 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.

If you have problems with bottom detection, you may consider disabling the function. This can be useful when you only wish to study targets in the water column. Use the dedicated option in the **Bottom Detection** dialog box.

- **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 settings made will not have any effect on the raw data that you save during the survey.

- **Information Pane Options**

The **Information Pane Options** dialog box allows you to change the operational parameters used to present the data in the information panes.

- **Bottom Detection**

The purpose of the **Bottom Detection** parameters is 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.

- **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 settings made will not have any effect on the raw data that you save during the survey.

- **Calculation Interval**

The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.

- **Colour Scale**

The **Colour Scale** dialog box allows you to change the echo level range presented by the current colour scale in the active view.

- **TS Histogram**

The **TS Histogram** options allow you to set up the parameters for the histogram presented in the *TS (Target Strength) Histogram* information pane.

– **Sv(f)**

The **Sv(f)** page controls the scale used in the *Sv(f)* information pane.

– **TS(f)**

The **TS(f)** page controls the scale used in the *TS(f)* information pane.

Context sensitivity

The choices in the **Active** menu depends on which view in the EK80 presentation that is currently "active".

The name of the currently active view is identified at the top of the menu.

To activate a view, click in it. The chosen view will appear with a thicker frame to indicate that it is active. The **Active** menu may therefore change from one view to another.

Related topics

[TVG function, page 418](#)

[Echogram dialog box, page 419](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Bottom Detection dialog box, page 437](#)

[Single Target Detection dialog box, page 440](#)

[Information Pane Options dialog box, page 443](#)

[Calculation Interval dialog box, page 381](#)

[Colour Scale dialog box, page 445](#)

[TS Histogram page, page 448](#)

[Sv\(f\) page, page 449](#)

[TS\(f\) page, page 449](#)

Extras menu

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

How to open

Click once on the icon under the **Main** menu to open the **Extras** "menu".

Click one more time on the icon to close the "menu".



Description

The **Extras** "menu" offers you the following parameter settings for the transceiver:

- Mode
- Pulse duration
- Sample interval
- Frequency
- Power
- Slope (in %)
- Ping rate
- Noise estimate
- Equivalent ambient noise

Additional parameters are shown for the currently selected depth layer.

Extras		
Transceiver Settings		
Mode:	Active	
Pulse Duration:	1.024	ms
Sample Interval:	0.085	ms
Frequency:	38000	Hz
Power:	2000	W
Slope:	0	%
Ping Rate:	0.5	pps
Noise Estimate:	-235.2	dB
Equivalent Ambient Noise:	-45.2	dB
Selected Layer		
Type:	Surface	
Calculation Interval:	200	Ping
Upper border:	50.0	m
Lower border:	100.0	m
sA:	0	m ² /nmi ²
Sv:	-256	m ² /m ³
Number of targets:	8	
Max TS in ping:	-14.1	dB
at depth:	53.30	m
Along angle:	0.0	°
Athwart angle:	0.0	°
Max TS in interval:	-14.1	dB
at depth:	53.30	m

Note

*The **Mode** is controlled by the **Operation** button on the **Operation** menu.*

*The **Pulse duration**, **Sample Interval** and **Power** parameters are controlled in the **Normal Operation** dialog box, while the **Frequency** parameter is defined by the transducer channel and the pulse type.*

*The **Slope** value also comes from the **Normal Operation** dialog box, where it is called **Ramping**.*

Functions and dialog boxes

Topics

[Main menu: Functions and dialog boxes, page 323](#)

[Operation menu: Functions and dialog boxes, page 331](#)

[Display menu: Functions and dialog boxes, page 363](#)

[Setup menu: Functions and dialog boxes, page 374](#)

[Active menu: Functions and dialog boxes, page 416](#)

[Secondary functions and dialogs boxes, page 451](#)

Main menu: Functions and dialog boxes

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

How to open

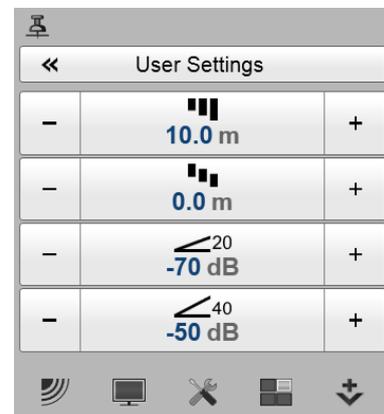
On the top bar, click once on the **Menu** button to hide the menu, and one more time to bring it back again. When the **Menu** is hidden, it will temporarily be shown on the left or right hand side of the display if you move the cursor to that position.



Description

- **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.



- **Range**

The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.

- **Start Range**

The **Start Range** function allows you to specify the start depth of the echogram; that is from which depth in the water column the presentation shall start. The value shown and selected is applied only to the currently selected echogram type.

- **Gain**

The purpose of the **Gain** function is to adjust the echo level in the EK80 presentations. In other words, it controls how much amplification that is applied to the received echoes. Note that the selected gain is by default only applied to the active view.

Topics

[User Settings dialog box, page 324](#)

[Range function, page 326](#)

[Start Range function, page 327](#)

[Gain function, page 329](#)

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

This **User Settings** dialog box is used to store your EK80 settings for different types of operations and/or fisheries, and settings related to user preferences.

You can create as many user profiles as you like, and give them any name. All the parameters you have entered using menu buttons and dialog boxes are saved.

Details

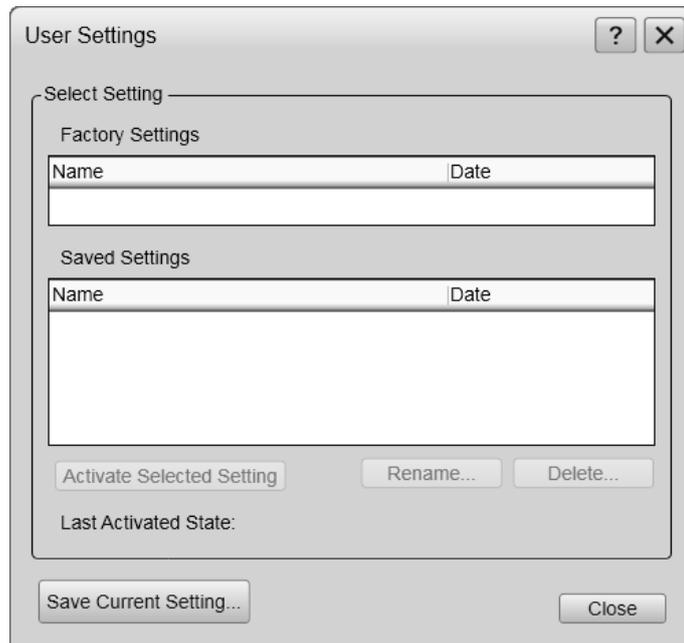
Factory Settings

These settings are the default values provided by Simrad.

The settings may be applied if you are uncertain of which parameter values to use. They offer "best practice" parameters for typical use. The factory settings cannot be altered.

Tip

Unless they are saved, all your current settings are lost when the default or saved settings are applied.



Saved Settings

These 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 computer.

Activate Selected Setting

To activate either a factory or a saved setting, click the setting name in one of the lists, then click this button.

Rename

This button is used to rename one of the saved settings.

To rename a setting, click the setting name, and then this button. A dedicated dialog box opens to accept the new name.

Note

The factory setting(s) can not be renamed.

Delete

This button is used to delete one of the saved settings.

To delete a setting, click the setting name, and then this button. A dedicated dialog box opens to verify your choice.

The factory setting(s) can not be deleted.

Save Current Setting

This button is used to save the currently applied EK80 settings.

To save the settings, click this button. A dedicated dialog box opens to accept the name of the new settings.

You can only add settings to the **Saved Settings** list.

Related topics

[Powering down the EK80, page 94](#)

[Powering up the EK80, page 92](#)

[Saving the current user settings, page 154](#)

[Using previously saved user settings, page 155](#)

[Renaming user settings, page 155](#)

[Deleting user settings, page 156](#)

[Choosing EK80 factory default settings, page 157](#)

[Main menu, page 311](#)

Range function

The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.



How to open

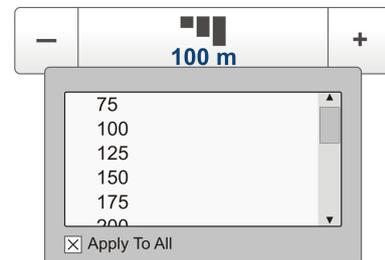
This function is activated on the **Main** menu.

Description

The range setting defines how "deep" you wish the EK80 to detect echoes, that is the vertical distance between the "top" and the "bottom" of the echogram. The **Range** setting specifies this "bottom" depth, while the **Start Range** setting specifies the "top" depth.

The range you specify applies to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box.

If you wish to apply the new range setting to all current echograms of the same type, click to select **Apply to all**.



Tip

If you open this menu button, you will only be able to enter a range value if a computer keyboard is connected to your EK80. However, you can click the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. This allows you to change the range value. You can also adjust the setting by clicking and holding either the [+] or [-] buttons.

The EK80 is designed to work with various range unit. This choice can be made by clicking the **Units** button on the **Display** menu.

Example

Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. 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 meters. The echogram will now show the area from the sea surface and down to 20 meters "below" the bottom. The bottom contour is easily detected when the depth changes.

Example

Start Range and Range in bottom related echogram

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

Details

Range

This parameter controls the displayed depth range in the echograms.

The start depth for the vertical range shown on the display will always be the value defined by the **Start Range** depth parameter. The echogram type is selected in the **Echogram** dialog box.

Tip

Click either side of the button to select a value. Click the middle of the button to open it. If you have a keyboard connected to the EK80, you can type the requested value into the text box.

Apply to all

Check this box to apply the new range setting to all current echograms of the same type.

Related topics

[Choosing Range and Start Range in a surface echogram, page 107](#)

[Choosing Range and Start Range in a bottom echogram, page 109](#)

[Main menu, page 311](#)

Start Range function

The **Start Range** function allows you to specify the start depth of the echogram; that is from which depth in the water column the presentation shall start. The value shown and selected is applied only to the currently selected echogram type.

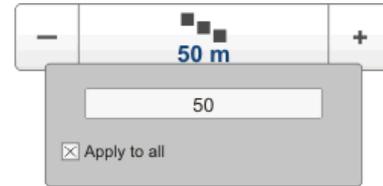


How to open

This function is activated on the **Main** menu.

Description

This start range parameter setting applies to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box.



Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

Example

Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. 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 meters. The echogram will now show the area from the sea surface and down to 20 meters "below" the bottom. The 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 meters. This will make the echogram start from 5 meters above the bottom. Set **Range** to the 5 meters plus 10 = 15 meters. The echogram will now show the area from 5 meters above the depth, and down to 10 meters "below" the bottom. The bottom contour will appear as a flat line.

Details

Start Range

This parameter controls the start depth of your echogram.

Tip

Click either side of the button to select a value. Click the middle of the button to open it. If you have a keyboard connected to the EK80, you can type the requested value into the text box.

Apply to all

Check this box to apply the new start range setting to all current echograms of the same type.

If you have selected a bottom echogram when you changed the value, this echogram type will also be applied to all the other bottom echograms when you select **Apply to all**. The same functionality applies to the other echogram types.

Related topics

[Choosing Range and Start Range in a surface echogram, page 107](#)

[Choosing Range and Start Range in a bottom echogram, page 109](#)

[Main menu, page 311](#)

Gain function

The purpose of the **Gain** function is to adjust the echo level in the EK80 presentations. In other words, it controls how much amplification that is applied to the received echoes. Note that the selected gain is by default only applied to the active view.



How to open

This function is activated on the **Main** menu.

Description

You can compare this gain setting with the volume control on your car radio. When the gain is increased, the echoes will appear stronger. Weak echoes will be easier to see. However, since you also increase the acoustic noise in the reception, the EK80 echo presentations will also show this noise. Too much gain may therefore "distort" the presentation.

Tip

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

There are two gain 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 scale is in dB, which means that if you wish to *increase* the gain, you must click the *left* [-] button to *reduce* the damping.

By default, the gain setting applies only to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box. If you wish to adjust the gain on all similar echograms in your view, click to select **Apply to all**.

When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.

Tip

*You can also adjust gain in the **Colour Scale** dialog box. This dialog box is opened in the **Depth** information pane.*



Details

Gain

Click either side of the button to increase or decrease the gain.

Click the middle of the button to open a text field. If you have a keyboard connected to your EK80, you can type the requested gain value.

Apply to all

Check **Apply to all** to use the new gain setting in all current echograms of the same type.

For example, if a surface echogram is active when you change the gain, the setting will automatically be applied to all the other surface echograms too. A similar functionality applies to the other echogram types.

Related topics

[Adjusting the echo sensitivity, page 105](#)

[Main menu, page 311](#)

Operation menu: Functions and dialog boxes

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

How to open

Click once on the icon under the **Main** menu to open the **Operation** menu.

Click one more time on the icon to close the menu.



Description

1 Operation

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

2 Normal Operation

The purpose of the **Normal Operation** dialog box is to provide you with an overview of the current transceiver parameters. It will also allow you to change these parameters.

3 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".

4 Ping Mode

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Interval*, and set the **Ping Interval** according to the survey requirements.

5 Ping Interval

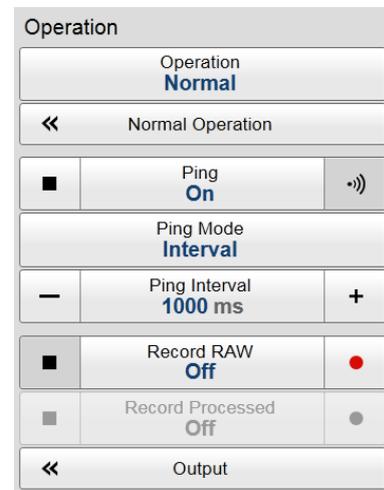
The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function will then permit you to choose the time (in milliseconds) between each transmission ("ping").

6 Record RAW

The **Record RAW** function allows you to record the *unprocessed* echo data received by the transducer, and save them on the internal hard disk. The raw data files can later be copied or moved to other recordable media.

7 Record Processed

The **Record Processed** function allows you to record the *processed* echo data received by the transducer, and save them on the internal hard disk. The data files can later be copied or moved to other recordable media. Which processing to apply is controlled by the **Processed Data Output** parameters in the **Outputs** dialog box.



8 Output

The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location.

The following pages can be opened.

- **File Setup**

The purpose of the **File Setup** page is to define the file and folder properties for the RAW and Processed data files recorded with the EK80.

- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

- **Processed Data Output**

The purpose of the **Processed Data Output** page is to define which processed data formats to export, and where to place the files.

- **Depth Output**

The **Depth Output** parameters are used to set up the output of depth data from the EK80 using a dedicated communication port (serial or Ethernet) on the Processor Unit.

- **Relay Output**

The **Relay Output** parameters allow you to export the sensor data that was originally imported into the EK80 system. This sensor data includes navigational information, motion sensor data and sound velocity.

Topics

[Operation function, page 333](#)

[Normal Operation dialog box, page 335](#)

[Ping function, page 338](#)

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

[Record RAW function, page 342](#)

[Record Processed function, page 344](#)

[Output dialog box, page 346](#)

[File Setup page, page 348](#)

[I/O Setup page, page 349](#)

[Processed Data Output page, page 354](#)

[Depth Output page, page 356](#)

[Relay Output page, page 360](#)

Operation function

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



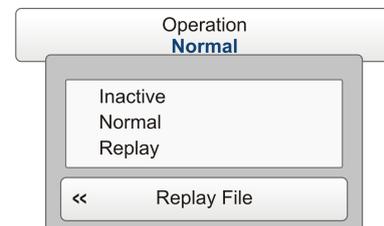
How to open

This function is activated on the **Operation** menu.

Description

The EK80 offers several operational modes.

- The *Normal* mode allows the EK80 to transmit ("ping") into the water, and to receive the echoes.
- *Inactive* is provided to pause the operation temporarily.
- *Replay* mode allows you to play back previously recorded echo data.



Click the middle of the button to open the secondary functions.

Note

*Note that Inactive operational 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.*

When you set the EK80 to *Replay* mode, click the **Replay File** button. The dialog box allows you to choose which file(s) to play back. To control the actual playback, use the replay bar. This is automatically shown at the top of the EK80 presentation in *Replay* mode.

Details

Inactive

Click 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 echogram is removed from the screen.

Normal

Select this option to start normal operational mode. The EK80 will transmit ("ping"), and then receive, process and display the relevant echo information. The EK80 will transmit according to the currently selected "ping" parameters.

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.*

Replay

Choose this option to start playback. This mode allows you to replay previously recorded echo data on the EK80.

Note

When you place your EK80 in Replay mode, you will not be able to transmit. The EK80 is inactive while playback takes place.

To select which recorded file to play back, click the **Replay File** button to open the **Replay File** dialog box.

To record data, use the **Record** function on the **Operation** menu.

Tip

*Do not confuse the **Record** function with the automatic **History** function. The **History** function records the echogram images automatically on the hard disk, and only a limited number of images are saved until the newest image replaces the oldest. The **Record** function allows you to record the raw data directly from the transceiver. The amount of data you can record is only limited by the size of your storage media.*

Related topics

- [Ping function, page 338](#)
- [Ping Mode function, page 340](#)
- [Ping Interval function, page 341](#)
- [Replay File dialog box, page 451](#)
- [Powering down the EK80, page 94](#)
- [Powering up the EK80, page 92](#)
- [Selecting *Normal* operational mode, page 95](#)
- [Selecting *Inactive* operational mode, page 96](#)
- [Selecting *Replay* operational mode, page 114](#)
- [Operation menu, page 312](#)

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 will also allow you to change these parameters.

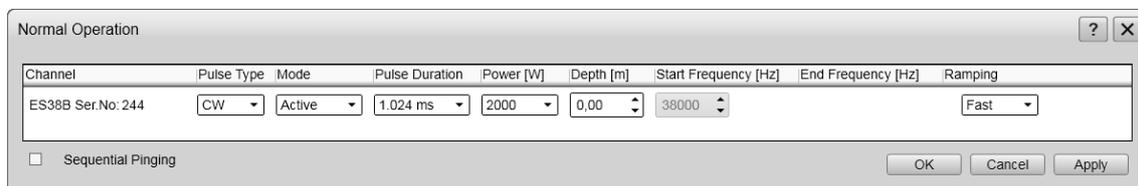


Prerequisites

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 main parameters for the transceiver(s). The dialog box provides one row (line) for each channel (transceiver/transducer combination) in use. You are permitted to change the parameters, but we will advise you not to do any changes unless you are well aware of the consequences.

Tip

*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.*

Details

Channel

This column specifies which transceiver(s) you are using. Each channel is identified by the transducer you are using on it.

Pulse Type

The **Pulse Type** function allows you to select which type of pulse transmission you wish to use; *CW* or *FM*.

"CW" means "continuous wave", while "FM" means "frequency modulated".

Note

In order to use the frequency sweep ("chirp") functionality, you must use frequency modulated (FM) pulses.

Mode

This column specifies the current transceiver mode. You can manually select a mode.

The following modes are available:

- **Active**

The transmitter and receiver are both active. This is the normal mode for operation.

This will make the EK80 operate as specified by the **Operation** function.

- **Passive**

The transmitter is passive while the receiver is active.

In *Passive* mode, the EK80 will receive and compute the signals detected by the transducer(s). This mode is thus useful for test purposes, and when you wish 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.

Note

*If you set **Mode** to *Passive*, your EK80 will no longer provide any information in the echogram(s).*

Pulse Duration

This column specifies the current duration of the transmitted pulse. You can manually select a different duration.

The pulse duration can be adjusted according to the current depth and what kind of bottom you are looking at. The deeper you wish to see, the longer pulse duration should be used. Remember that in the EK80 echo sounder, the pulse duration and the bandwidth is mutually dependant.

- Long pulse => lots of acoustic energy => narrow bandwidth => less sensitive for noise from own vessel and environment
- Short pulse => less acoustic energy => wide bandwidth => more sensitive for noise from own vessel and environment

Tip _____

For normal use, we recommend that the pulse duration is set to Auto.

Power

The **Power** parameter in the **Normal Operation** dialog box displays and controls the transmitter's output power measured in Watts. 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.

Depth

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.

Start/End Frequency

These two parameters are used to set up a frequency sweep.

Tip _____

If the parameters for start and end frequencies are unavailable, the transducer used on the relevant channel does not support wideband transmissions.

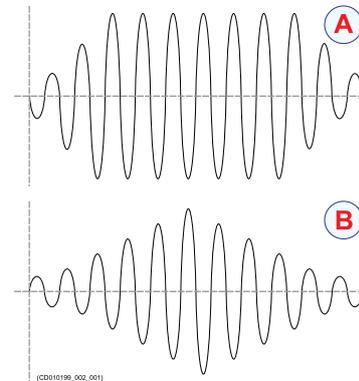
Note _____

It is very important that the transducer you are using complies to the frequencies you choose. This is defined in the transducer setup file. If you choose a frequency range that is not supported, and error message will appear.

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 only two cycles. At the end of the pulse, another two cycles are used to reduce the output level. 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.



Sequential pinging

The **Sequential pinging** function can be used if you have more than one channel (transceiver/transducer) 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.

Tip

*The **Sequential pinging** function can be very useful if your transducers are located in such a manner that interference is a problem.*

Related topics

- [Selecting *Passive* transceiver mode, page 158](#)
- [Adjusting the output power, page 159](#)
- [Adjusting the pulse duration \(length\), page 159](#)
- [Defining the frequency sweep \(chirp\) within each transmission, page 160](#)
- [Defining the installation depth of the transducer, page 161](#)
- [Defining the pulse type for the EK80 transmissions, page 223](#)
- [Operation menu, page 312](#)
- [Ramping concept description, page 464](#)

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 activated on the **Operation** menu.

Description

The audio transmission ("pinging") from the EK80 can be switched off or on. Click the middle of the button to open the submenu, 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 switched on, you can use the **Ping Mode** function to choose how often the EK80 shall transmit sound into the water.

Details

On

The EK80 "pings" (transmits) audio energy into the water.

The ping mode is controlled by the **Ping Mode** and **Ping Interval** parameters.

Off

The EK80 does not "ping": no transmissions take place.

When the audio transmission has been disabled using this function, the EK80 will stop with the current echogram shown on the screen.

Tip

*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 topics

[Ping Mode function, page 340](#)

[Ping Interval function, page 341](#)

[Operation function, page 333](#)

[Powering down the EK80, page 94](#)

[Powering up the EK80, page 92](#)

[Selecting *Normal* operational mode, page 95](#)

[Defining the transmission modes, page 129](#)

[Operation menu, page 312](#)

Ping Mode function

The **Ping Mode** function is used to control how often the EK80 shall transmit its energy into the water. For normal use, choose *Interval*, and set the **Ping Interval** 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 activated on the **Operation** menu.

Description

This function allows you to control the behavior of the transmission ("pinging").

If you choose *Single Ping*, you can transmit single pings by clicking the ping symbol on the **Ping** button.

If you choose *Interval*, you must define the interval using the **Ping Interval** function.



Note

*For scientific operations, we recommend that you use Interval mode, and set the **Ping Interval** value according to the survey requirements.*

Details

Single Ping

This option allows the EK80 to transmit single pings.

The EK80 will transmit ("ping") only when you click the right side of the **Ping** button.

Interval

The EK80 will transmit ("ping") with a fixed time interval. The time interval (in milliseconds) is chosen with the **Ping Interval** function.

Maximum

The EK80 will transmit ("ping") as frequent as possible. The ping rate will mainly depend on the current range.

The ping rate may 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 EK80 system communicates with external peripherals, or how long time the Processor Unit uses to save data.

Related topics

- [Ping Interval function, page 341](#)
- [Ping function, page 338](#)
- [Operation function, page 333](#)
- [Powering down the EK80, page 94](#)
- [Powering up the EK80, page 92](#)
- [Selecting *Normal* operational mode, page 95](#)
- [Defining the transmission modes, page 129](#)
- [Transmitting single pings, page 101](#)
- [Transmitting with fixed time intervals, page 101](#)
- [Operation menu, page 312](#)

Ping Interval function

The **Ping Interval** function is used when **Ping Mode** is set to *Interval*. The **Ping Interval** function will then permit you to choose the time (in milliseconds) between each transmission ("ping").



Prerequisites

The Ping Interval function box is only available when the EK80 operates in *Normal* mode, and **Ping Mode** is set to *Interval*.

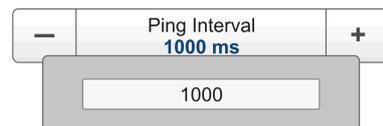
How to open

This function is activated on 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.



Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

Details

Ping Interval

Choose the time (in milliseconds) between each transmission ("ping").

Related topics

[Ping Mode function, page 340](#)

[Ping function, page 338](#)

[Operation function, page 333](#)

[Defining the transmission modes, page 129](#)

[Transmitting with fixed time intervals, page 101](#)

[Operation menu, page 312](#)

Record RAW function

The **Record RAW** function allows you to record the *unprocessed* echo data received by the transducer, and save them on the internal hard disk. The raw data files can later be copied or moved to other recordable media.



How to open

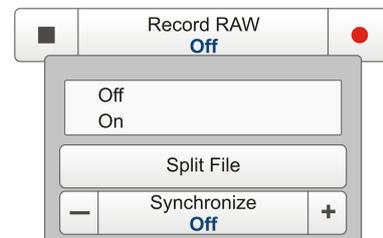
This function is activated on the **Operation** menu.

Description

You can set up the EK80 to record the unprocessed transducer signals on the internal hard disk, or other recordable media. These files may be kept for future references.

By means of the *Replay* function on the **Operation** button 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 settings, as this will help you to gain more experience.

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 processed 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 the data formats simultaneously.

To synchronize the recording functions, click **Record RAW**→**Synchronize**. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

To change the file and folder parameters, open the **Outputs** dialog box on the **Operation** menu, and select **File Setup**.

Ways to record echograms data

On the EK80, you can save and recall echo information in the following ways.

- a Bitmap images (containing the full EK80 screen) are saved whenever you click the **Screen Capture** button on the top bar. These images are recalled by means of the **Screen Captures** tab at the bottom of the EK80 presentation.
- b Raw data is recorded using the **Record RAW** function on the **Operation** menu. The raw data files may be played back by placing the EK80 in *Replay* mode.
- c 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". To play back the history file, click the **History** button on the top bar.

Tip

*You can also save processed echogram data using the **Record Processed** function on the **Operation** menu. These data are only exported, and can not be played back on the EK80.*

Details

On/Off

You can use these options on the button menu to start and stop recording.

For faster control of the recording, you can click 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.

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** function. It may be useful to synchronize these two functions to automatically record all the data formats simultaneously.

To synchronize the recording functions, click **Synchronize** to enable it. The **Record Processed** is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Related topics

[Recording raw data, page 221](#)

[Operation menu, page 312](#)

Record Processed function

The **Record Processed** function allows you to record the *processed* echo data received by the transducer, and save them on the internal hard disk. The data files can later be copied or moved to other recordable media. Which processing to apply is controlled by the **Processed Data Output** parameters in the **Outputs** dialog box.



How to open

This function is activated on the **Operation** menu.

Description

You can set up the EK80 to 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 processed 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 the data formats simultaneously.

To synchronize the recording functions, click **Record RAW**→**Synchronize**. The **Record Processed** button is then inhibited, and you can start and stop all recording by means of the **Record RAW** button.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Details

On/Off

You can use these options on the button menu to start and stop recording.

For faster control of the recording, you can click the right and left side of the **Record Processed** button. To start recording, click the red circle on the right side.

To stop recording, click the black rectangle on the left side.

Processed data formats

The following processed data output formats are available.

- **None**
- **XYZ**

This is processed and interpolated xyz data in ASCII format. Note that navigation input must be available.

- **EK500**

This is the proprietary **EK500** datagram format. The datagrams consists of user defined excerpts of the processed sample data (pixel data), ie the backscatter value of the targets. The echograms are stored as time tagged datagrams in separate files.

Related topics

[Recording processed data, page 118](#)

[Operation menu, page 312](#)

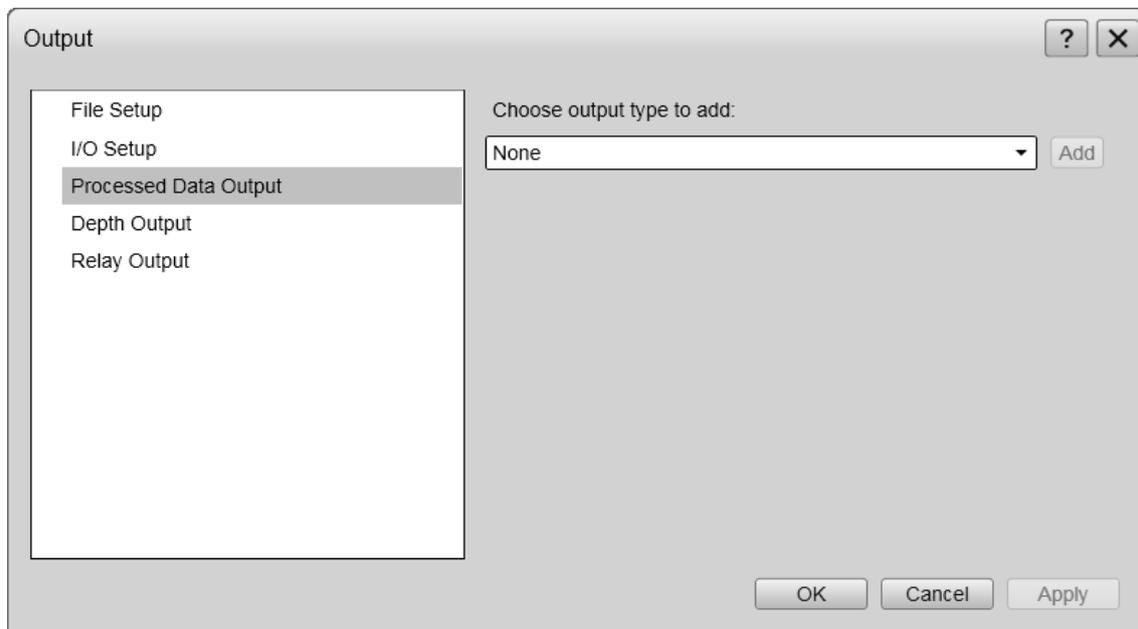
Output dialog box

The purpose of the **Output** dialog box is to collect all functionality related to EK80 data output in one easily accessible location.



How to open

This dialog box is opened from the **Operation** menu.



Description

The **Output** dialog box provides a menu on the left side, and several pages for operational parameters on the right side.

The following pages can be opened.

- **File Setup**

The purpose of the **File Setup** page is to define the file and folder properties for the RAW and Processed data files recorded with the EK80.

- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

- **Processed Data Output**

The purpose of the **Processed Data Output** page is to define which processed data formats to export, and where to place the files.

- **Depth Output**

The **Depth Output** parameters are used to set up the output of depth data from the EK80 using a dedicated communication port (serial or Ethernet) on the Processor Unit.

- **Relay Output**

The **Relay Output** parameters allow you to export the sensor data that was originally imported into the EK80 system. This sensor data includes navigational information, motion sensor data and sound velocity.

Tip

*The **I/O Setup** page can also be opened from the **Installation** dialog box on the **Setup** menu.*

Related topics

[File Setup page, page 348](#)

[I/O Setup page, page 349](#)

[Processed Data Output page, page 354](#)

[Depth Output page, page 356](#)

[Relay Output page, page 360](#)

[Defining the file and folder settings for raw data recording, page 220](#)

[Setting up depth output to an external system, page 174](#)

[Exporting sensor data to a peripheral system, page 177](#)

[Operation menu, page 312](#)

File Setup page

The purpose of the **File Setup** page is to define the file and folder properties for the RAW and Processed data files recorded with the EK80.

How to open

This page is located in the **Output** dialog box. To open, click **Output** on the **Operation** menu.



Description

The **File Setup** parameters control how and where the recorded files are saved on the Processor Unit hard disk, or on an external disk. By adding a file name prefix, you can also identify files recorded from any specific mission or survey. Additional limitations may also be specified.

 A screenshot of the File Setup dialog box. It contains four sections:

- General**: A text field for 'Current output directory:' with a 'Browse...' button.
- File Name**: A text field for 'File name prefix:'.
- File size**: A dropdown menu for 'Max. file size [MB]:' set to '100' and a text field for 'Current file size [B]:' set to '0'.
- Raw Data**: A dropdown menu for 'Range [m]:' set to '0'.

Tip

Set up the file and folder parameters before you start the recording.

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

Details

Current output directory

This field displays the file path currently selected to store the data files.

Browse

Click this button to select 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.

File name prefix

Type any name into the text box. The chosen name will be used as prefix in all the data file names.

Max(imum) File Size

Define a limit for the maximum amount of bytes to be contained in one data file. A value of 0 means that the file size is limited to 1 Gb.

Current File Size

The current size of the RAW data file is displayed during data recording

Raw Data Range

Use this setting to define which depth to collect data from. The EK80 will only record data retrieved between the sea surface and the selected depth (in meters).

Related topics

[Output dialog box, page 346](#)

[Defining the file and folder settings for raw data recording, page 220](#)

[Operation menu, page 312](#)

I/O Setup page

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

How to open

This page is located in both the **Output** and **Installation** dialog boxes. To open these, click the relevant buttons 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 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. Click once on the port you wish to work with, and then one of the buttons below the list.

Tip

*You can define all your EK80 inputs using the **I/O Setup** parameters, but not the outputs. To set up the data export, open the **Outputs** dialog box on the **Operation** menu.*

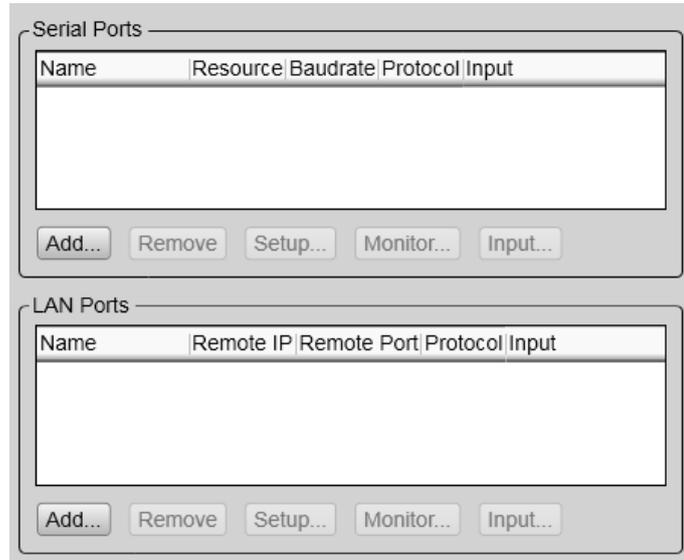
Details, Serial ports

Serial Ports

This table shows you the available serial ports on the Processor Unit.

The list is automatically populated the first time the **I/O Setup** page is opened after a EK80 software installation.

It will then reflect the initial number of serial ports available on the Processor Unit. If you later add interface hardware to your Processor Unit, you must click **Add** to add the new ports to the list.



Name

This column in the **Serial Ports** table shows the given identity of the serial port. By default, the serial ports are numbered.

Resource

This column in the **Serial Ports** table shows you the Processor Unit's communication port identification. The ports are normally named COM1, COM2 etc.

Baudrate

This column in the **Serial Ports** table shows you the current baudrate specified for the serial line. Standard baudrate defined for NMEA communication is 4800 baud.

Protocol

This is the current protocol specified for the serial line.

Each serial line can receive multiple telegrams simultaneously, provided that the telegrams all use the same protocol.

However, only one peripheral device may be physically connected to the port. If you wish to connect several peripheral devices to a single serial port, you must route these through a "mixer". This can be a hardware unit or computer collecting and streaming the telegrams.

Input(s)

This column in the **Serial Ports** table is used to identify the external sensor (measuring device) currently connected to the port.

To choose what type of external sensor to import data from, click the **Input** button under the table.

Add

Click this button to add a new serial port.

This is required if you have added new hardware to the computer, for example by installing an extra interface circuit adapter. If you have previously released an unused serial port, but wish to bring it back to EK80 use, you must also click this button. The button is disabled if the computer has no more serial communication ports to offer. If ports are available, a small dialog box is opened to choose port.

Remove

Once the EK80 has identified and listed all the available serial lines on the computer, these can not be used by any other software applications on the same computer.

If the EK80 does not need a specific serial line, it can be released for other use. Click on the applicable port to select it, then click the **Remove** button to delete the port from the list. Note that no acknowledgement is required, the port is removed instantly.

Setup

In order to use a serial line to receive or transmit information, its communication parameters must be set up to match the properties of the peripheral device.

Click one of the listed ports to select it, then click the **Setup** button to set up the port parameters. A dedicated dialog box is provided.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

Monitor

If you suspect that the communication on the serial port is ineffective, faulty or missing, you can monitor the flow of telegrams.

Click one of the listed ports to select it, then click the **Monitor** button to observe the data communication on the selected serial port. A dedicated dialog box is provided.

Input

When you add a new port, you must define the source of the input data.

Click the port to select it, then click the **Input** button to define which external devices you wish to import data from. A dedicated dialog box is provided.

Details, Local Area Network (LAN) ports

LAN Ports

This table shows you the available Ethernet (LAN) ports on the Processor Unit.

Each Ethernet interface adapter on your computer supports any number of network ports. To add a new port, you must click the **Add** button to add the new ports to the list.

Name

This column in the **LAN Ports** table shows the given identity of the network (LAN) port. By default, the LAN ports are numbered.

Remote IP

This is the Internet Protocol (IP) address of a remote computer.

If you wish to export information to another computer, you must either define this IP address, or enter IP broadcast address 255.255.255.255. The broadcast address will allow all computers connected to the network to receive the information. If only you wish to receive information on the LAN port, you do not need to define this address.

Remote port

If you wish 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 the remote computer.

To find this port number, consult the documentation for software program to be used on the remote computer.

Protocol

This column in the **LAN Ports** table is used to identify the current protocol specified for the LAN port. Each LAN port can receive multiple telegrams simultaneously, provided that the telegrams all use the same protocol.

Input(s)

This column in the **LAN Ports** table is used to identify the external sensor (measuring device) currently connected to the LAN port.

To choose what type of external sensor to import data from, click the **Input** button under the table.

Add

Click this button to add a new LAN (Ethernet) port.

This is required if you have added new hardware to the computer, for example by installing an extra Ethernet interface adapter. If you have previously released an unused LAN port, but wish to bring it back to EK80 use, you must also click this button.

Remove

Once the EK80 has identified and listed all the available LAN ports on the computer, these can not be used by any other software applications on the same computer.

If the EK80 does not need a specific LAN port, it can be released for other use. Click on the applicable port to select it, then click the **Remove** button to delete the port from the list. Note that no acknowledgement is required, the port is removed instantly.

Setup

In order to use a LAN (Ethernet) port to receive or transmit information, its communication parameters must be set up to match the peripheral device.

Click one of the listed ports to select it, then click the **Setup** button to set up the port parameters. A dedicated dialog box is provided.

Monitor

If you suspect that the communication on the LAN port is ineffective, faulty or missing, you can monitor the flow of telegrams.

Click one of the listed ports to select it, then click the **Monitor** button to observe the data communication on the selected LAN port. A dedicated dialog box is provided.

Input

When you add a new port, you must define the source of the input data.

Click the port to select it, then click the **Input** button to define which external devices you wish to import data from. A dedicated dialog box is provided.

Related topics

[Output dialog box, page 346](#)

[Installation dialog box, page 382](#)

[LAN Port Setup dialog box, page 453](#)

[Serial Port Setup dialog box, page 454](#)

[Port Monitor dialog box, page 456](#)

[Add Serial Port dialog box, page 458](#)

[Select Inputs dialog box, page 458](#)

[Setting up the input from a navigation system, page 164](#)

[Setting up the input from a Motion Reference Unit \(MRU\), page 168](#)

[Setting up the input from a sound speed sensor, page 170](#)

[Setting up a serial line for annotation input, page 172](#)

[Setting up depth output to an external system, page 174](#)

[Exporting sensor data to a peripheral system, page 177](#)

[Operation menu, page 312](#)

[Main menu, page 316](#)

[NMEA datagram formats, page 527](#)

[Proprietary datagram formats, page 534](#)

[Third party datagram formats, page 541](#)

Processed Data Output page

The purpose of the **Processed Data Output** page is to define which processed data formats to export, and where to place the files.

How to open

This page is located in the **Output** dialog box. To open, click **Output** on the **Operation** menu.



Description

The **Processed Data Output** page provides you with a selection of data output formats, and a button; **Add**.

Several output formats are available. To select the data format, select it from the list, and click **Add**. The **Processed Data Output Configuration** dialog box opens to collect additional parameters. Which parameters that are required depends on the data format you have chosen.

Note

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 computer is equipped with a very large disk capacity, we recommend that you save the data files to an external storage device.

Once a data output format has been defined, it will be listed in the menu on the left side of the **Outputs** dialog box. To see the relevant data output parameters, click on the menu entry. The parameters collected by the **Processed Data Output Configuration** dialog box are then shown. This will also allow you to stop the data format from being exported.

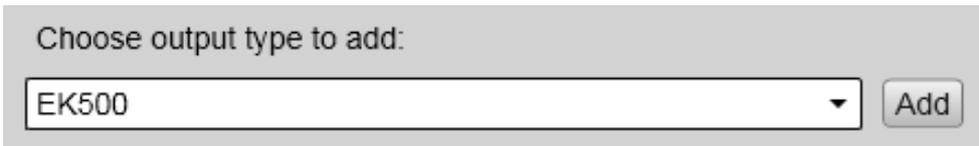
Tip

You can export several data formats simultaneously, as each of them will be saved as a separate file.

Starting and stopping the recording of processed data

To start and stop recording of processed data, use the **Record Processed** function on the **Operation** menu.





Details

Choose output type to add

Select which data type to output while recording processed data.

The following data output formats are available:

- **None**
- **XYZ**

This is processed and interpolated xyz data in ASCII format. Note that navigation input must be available.

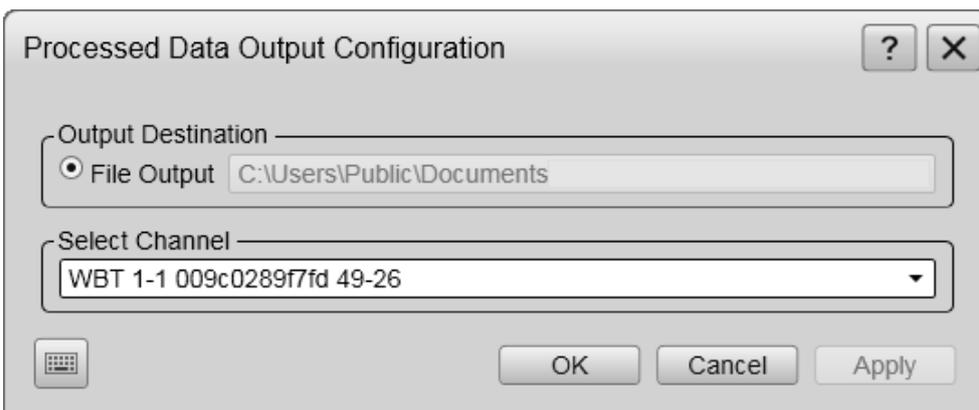
- **EK500**

This is the proprietary **EK500** datagram format. The datagrams consists of user defined excerpts of the processed sample data (pixel data), ie the backscatter value of the targets. The echograms are stored as time tagged datagrams in separate files.

Add

Click to enable export of the chosen data format.

The **Processed Data Output Configuration** dialog box opens to collect additional parameters. Which parameters depends on the data format you have chosen.



Remove

Information that has been defined for export is listed on the collapsed menu on the left side of the **Outputs** dialog box. To see the relevant output parameters, click the menu entry. The **Remove** button will stop the current information from being exported.

Output destination

This field shows you the current folder chosen for the recorded data files. You are not permitted to change the folder here.

Tip

*If you need to change the disk and/or folder location, select **File Setup** in the **Outputs** dialog box.*

Select Channel

This phrase *channel* is used to identify the combination of a transceiver, transducer and frequency. Several data formats will require you to define from which channel you wish to export data.

Related topics

[Output dialog box, page 346](#)

[Operation menu, page 312](#)

Depth Output page

The **Depth Output** parameters are used to set up the output of depth data from the EK80 using a dedicated communication port (serial or Ethernet) on the Processor Unit.

How to open

This page is located in the **Output** dialog box. To open, click **Output** on the **Operation** menu.



Description

These parameters allow you to define which port (serial or Ethernet) to use for depth output, and which format to use. You can set up the EK80 to export the depth information on more than one port.

The EK80 may output the current depth on several NMEA datagram formats, as well as a number of proprietary formats.

Select the data format, and click **Add**. The **Depth Output Configuration** dialog box opens to collect additional parameters.

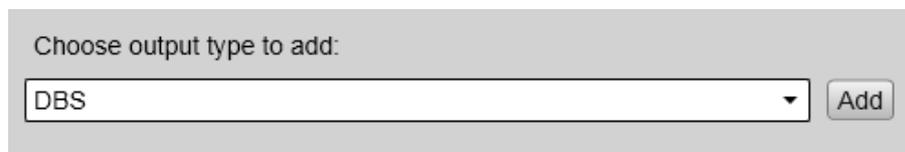
Note

*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 depth output parameters.*

Once an output format has been defined, it will be listed in the collapsed menu on the left side of the **Outputs** dialog box. To see the relevant output parameters, click on the menu entry. The parameters collected by the **Depth Output Configuration** dialog box are then shown. This will also allow you to stop the depth information from being exported.

Note

You can export several depth formats simultaneously, as each of them are handled independently.



Details

Choose output type to add

Select which depth datagram type to export.

- **NMEA DBS**

The NMEA DBS datagram provides the current depth from the surface. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram.

- **NMEA DBT**

The NMEA DBT datagram provides the current depth under the transducer. In dew designs, this datagram is frequently used to replace the DBK and DBS datagrams.

- **NMEA DPT**

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

- **Simrad EK500 Depth**

Simrad EK500 Depth is a proprietary datagram format created by Kongsberg Maritime. It was originally defined for the Simrad EK500 scientific echo sounder. It provides the current depth from three channels, as well as the bottom surface backscattering strength and the athwartships bottom slope. This telegram has been designed for output on either a serial line or a local area network Ethernet connection.

- **Atlas Depth**

Atlas Depth is a proprietary datagram format created by Atlas Elektronik (<http://www.atlas-elektronik.com/>) to provide the current depth from two channels.

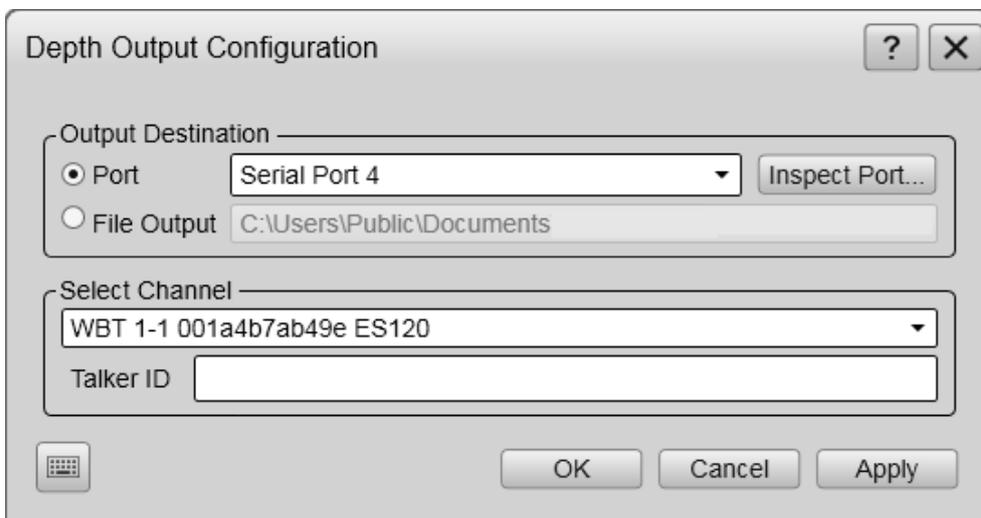
Add

Click to enable export of the chosen depth datagram format.

The **Depth Output Configuration** dialog box opens to collect additional parameters. Which parameters depends on the data format you have chosen.

Remove

Information that has been defined for export is listed on the collapsed menu on the left side of the **Outputs** dialog box. To see the relevant output parameters, click the menu entry. The **Remove** button will stop the current information from being exported.



Output Destination

You can send the data out on a communication port (serial or LAN) on the Processor Unit, or you can save the data to a file.

Port

Click this check box if you wish to send the information to a communication port on your Processor Unit. Then, select which serial or LAN port to use for the output data.

Inspect Port

Once you have selected a serial or Ethernet communication port, click this button to inspect the current port parameters. The relevant port setup dialog box opens, but you are not permitted to make any changes.

Tip

*If you need to adjust the communication parameters, select **I/O Setup** in the **Outputs** dialog box.*

File Output

Click this check box if you wish to send the information to a file. You are not permitted to change the folder here.

Tip

*If you need to change the disk and/or folder location, select **File Setup** in the **Outputs** dialog box.*

Select Channel

This phrase *channel* is used to identify the combination of a transceiver, transducer and frequency. This column specifies which channel you are using as source for the depth information. The text string provides the following information:

- Transceiver ID
- Transceiver's IP address
- Transducer name

If you have more than one transceiver, you can choose which one to use.

Talker ID

If you wish to specify a dedicated Talker ID on the datagram format, it can be selected 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 defines the type of message. The Talker ID identifies the system that sends the datagram. You may leave this field blank, which means that two blank characters are inserted into the datagram, or you may 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 some 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, click the **Keyboard** button to open an on-screen keyboard.*

Supported datagram formats for depth information

The EK80 supports the following datagram formats for depth output.

- **NMEA DBS**

The NMEA DBS datagram provides the current depth from the surface. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram.

- **NMEA DBT**

The NMEA DBT datagram provides the current depth under the transducer. In dew designs, this datagram is frequently used to replace the DBK and DBS datagrams.

- **NMEA DPT**

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

- **Simrad EK500 Depth**

Simrad EK500 Depth is a proprietary datagram format created by Kongsberg Maritime. It was originally defined for the Simrad EK500 scientific echo sounder. It provides the current depth from three channels, as well as the bottom surface backscattering strength and the athwartships bottom slope. This telegram has been designed for output on either a serial line or a local area network Ethernet connection.

- **Atlas Depth**

Atlas Depth is a proprietary datagram format created by Atlas Elektronik (<http://www.atlas-elektronik.com/>) to provide the current depth from two channels.

Related topics

[Output dialog box, page 346](#)

[Setting up depth output to an external system, page 174](#)

[Operation menu, page 312](#)

[NMEA DBS datagram, page 528](#)

[NMEA DBT datagram, page 528](#)

[NMEA DPT datagram, page 529](#)

[Simrad EK500 Depth datagram, page 534](#)

[Atlas Depth datagram, page 541](#)

Relay Output page

The **Relay Output** parameters allow you to export the sensor data that was originally imported into the EK80 system. This sensor data includes navigational information, motion sensor data and sound velocity.

How to open

This page is located in the **Output** dialog box. To open, click **Output** on the **Operation** menu.



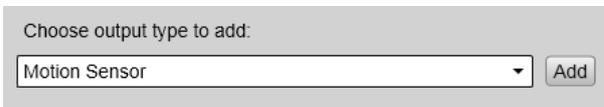
Description

The information provided to the EK80 system from various sensors can also be useful for other systems on board your vessel. The EK80 allows you to export this sensor information on a chosen communication port.

The following sensor data can be exported:

- Navigation
- Motion sensor

When activated, the selected information is exported on a communication port (serial or LAN) on the Processor Unit.



Details

Choose output type to add

Select which information to export.

Add

Click to enable export of the chosen information.

The **Relay Output Configuration** dialog box opens to collect additional parameters.

Remove

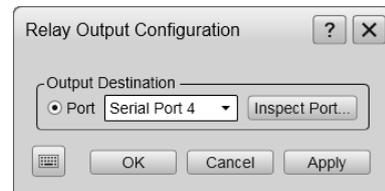
Information that has been defined for export is listed on the collapsed menu on the left side of the **Outputs** dialog box. To see the relevant output parameters, click the menu entry. The **Remove** button will stop the current information from being exported.

Output Destination

You can only send the data to a communication port (serial or LAN) on the Processor Unit.

Inspect Port

Once you have selected a serial or Ethernet communication port, click this button to inspect the current port parameters. The relevant port setup dialog box opens, but you are not permitted to make any changes.



Tip

*If you need to adjust the communication parameters, select **I/O Setup** in the **Outputs** dialog box.*

Related topics

[Output dialog box, page 346](#)

[Exporting sensor data to a peripheral system, page 177](#)

[Operation menu, page 312](#)

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

Click once on the icon under the **Main** menu to open the **Display** menu.

Click one more time on the icon to close the menu.



Description

1 Screen Brightness

The purpose of the **Screen Brightness** function is to adjust the intensity of the light given off by the display presentation.

2 Transparency

When you open an information pane, you will see that it is transparent. The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened.

3 Layout

The purpose of the **Layout** dialog box is to define which transducer channels you wish to see in the EK80 presentation. You can also position the echogram views in relation to each other.

4 Display Options

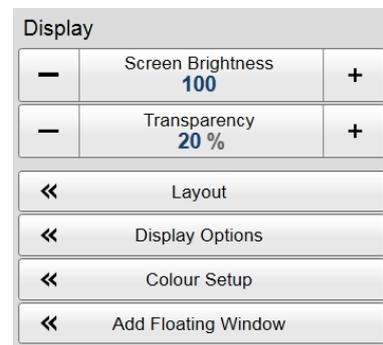
The **Display Options** dialog box allows you to control the location of the menu. It also controls which information you wish to see on the top bar and in the status bar.

5 Colour Setup

The **Colour Setup** dialog box allows you to select the presentation colours used by the EK80.

6 Add Floating Window

The **Add Floating Window** dialog box allows you to grab a complete echogram presentation for a chosen channel, and place it in a separate window. This window can for example be moved to a separate display on a Processor Unit using two or more displays.



Topics

[Screen Brightness function, page 364](#)

[Transparency function, page 365](#)

[Layout dialog box, page 365](#)

[Display Options dialog box, page 367](#)

[Colour Setup dialog box, page 370](#)

[Add Floating Window dialog box, page 372](#)

Screen Brightness function

The purpose of the **Screen Brightness** function is to adjust the intensity of the light given off by the display presentation.

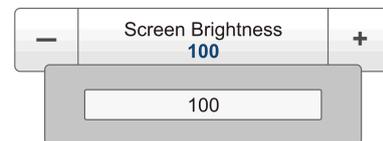


How to open

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.

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.*

When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.

Related topics

[Reducing the light emitted from the display presentation, page 148](#)

[Display menu, page 315](#)

Transparency function

When you open an information pane, you will see that it is transparent. The **Transparency** function allows you to adjust how much you are able to see "through" the information panes you have opened.

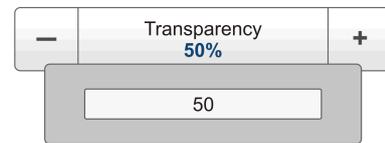


How to open

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 display presentation.



In order not to lose 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%.

Tip

*When you use this function, you will only be able to type a new value if a computer keyboard is connected to your EK80 Processor Unit. Without a keyboard, you can adjust the setting by clicking and holding either the **Plus** or **Minus** button. You can also click the middle of the button, hold the mouse button depressed, and then move the mouse - and cursor - sideways. All these methods allow you to change the setting.*

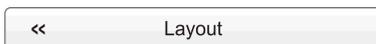
Related topics

[Increasing the visibility of the information panes, page 149](#)

[Display menu, page 315](#)

Layout dialog box

The purpose of the **Layout** dialog box is to define which transducer channels you wish to see in the EK80 presentation. You can also position the echogram views in relation to each other.

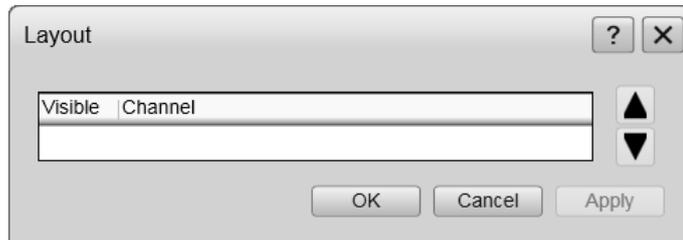


How to open

This dialog box is opened from the **Display** menu.

Description

In a large system with many transceivers and transducers in simultaneous use, it can be useful to hide channels temporarily from view.



When two or more echograms are shown, you can also 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.

Tip

Remember that you can also hide or show echogram channels by clicking the transducer tabs at the bottom of the EK80 presentation.

Details

Visible

This box is used to hide or show an echogram channel.

Tip

Echogram channels can also be hidden using the transducer tabs at the bottom of the EK80 presentation.

Channel

Each line represent a transducer. The transducer name shown is the name you chose when you installed the transducer in the **Installation** dialog box.

Arrow buttons

Use the two arrow buttons on the right hand side to change the order of the channels. Click a channel to select it, then one of the arrow buttons to change its location on the list.

Related topics

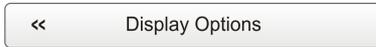
[Controlling the echogram views from the status bar, page 127](#)

[Selecting which echograms to see, page 128](#)

[Display menu, page 315](#)

Display Options dialog box

The **Display Options** dialog box allows you to control the location of the menu. It also controls which information you wish to see on the top bar and in the status bar.



How to open

This dialog box is opened from the **Display** menu.

Description

The **Display Options** dialog box has two tabs.

- **General**

The **General** page in the **Display Options** dialog box controls the location of the menu, and allows you to choose which navigational information to be shown on the top bar. You can also enable the EK80 to show you Coordinated Universal Time (UTC) at the bottom of the presentation.

- **Tooltip**

The **Tooltip** page controls which tooltips you wish to see when you move the cursor in the EK80 user interface.

The choices you make have no effect on the overall performance of the EK80.

Important

The navigational information provided on the EK80 top bar must not be used for vessel navigation!

Topics

[General page, page 368](#)

[Tooltip page, page 370](#)

General page

The **General** tab controls the location of the menu, and allows you to choose which navigational information to be shown on the top bar.

Description

The **General** page offers a range of "on/off switches". These allow you to enable or disable the relevant functions.

Details

Menu on the Right Side

Click this option to place the menu on the right hand side of the EK80 presentation.

Top bar

Select which information elements that shall be shown on the top bar.

- **Navigation**

Click this option to show the current geographical position on the top bar. The information must be provided by an external navigation system connected to the EK80.

- **Heading**

Click this option to display the vessel's current heading on the top bar. The information must be provided by an external positioning system, or by a heading sensor or gyro compass connected to the EK80.

- **Speed**

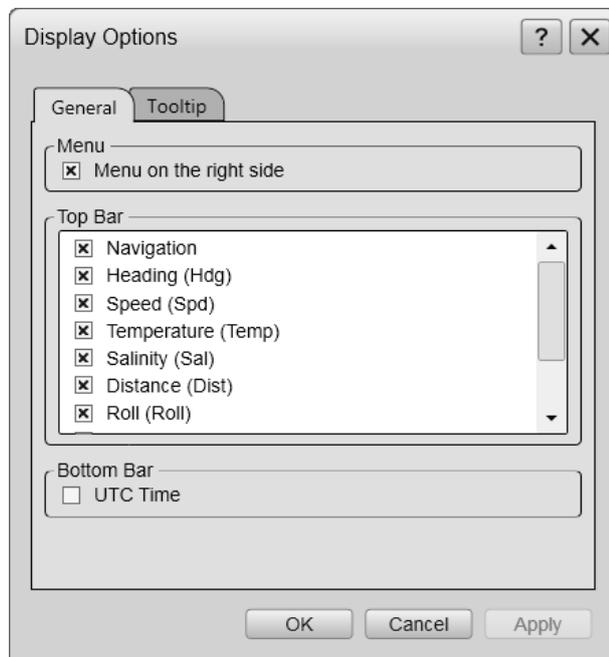
Click this option to display the current speed on the top bar. The information must be provided by an external speed log or a navigation system connected to the EK80.

- **Temperature**

Click this option to display the current temperature on the top bar. The information must be provided by an external sensor connected to the EK80.

- **Salinity**

Click this option to display the current water salinity on the top bar. The information must be provided by an external sensor connected to the EK80.



- **Vessel distance**
Click this option to display the sailed distance on the top bar. The information must be provided by an external sensor connected to the EK80.
- **Roll**
Click this option to display the vessel's current roll movements on the top bar. The information must be provided by an external motion sensor connected to the EK80.
- **Pitch**
Click this option to display the vessel's current pitch movements on the top bar. The information must be provided by an external motion sensor connected to the EK80.
- **Heave**
Click this option to display the vessel's current heave movements on the top bar. The information must be provided by an external motion sensor connected to the EK80.
- **Depth [transducer]**
Click this option to display the current water depth from a named [transducer] on the top bar.

UTC Time

Click to show Coordinated Universal Time (UTC) time on the status bar at the bottom of the EK80 presentation.

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, June 2014

Related topics

[Selecting the navigational information to appear on the top bar, page 150](#)

[Enabling Coordinated Universal Time \(UTC\) time at the bottom of the presentation, page 151](#)

Tooltip page

The **Tooltip** tab controls which tooltips you wish to see when you move the cursor in the EK80 user interface.

Description

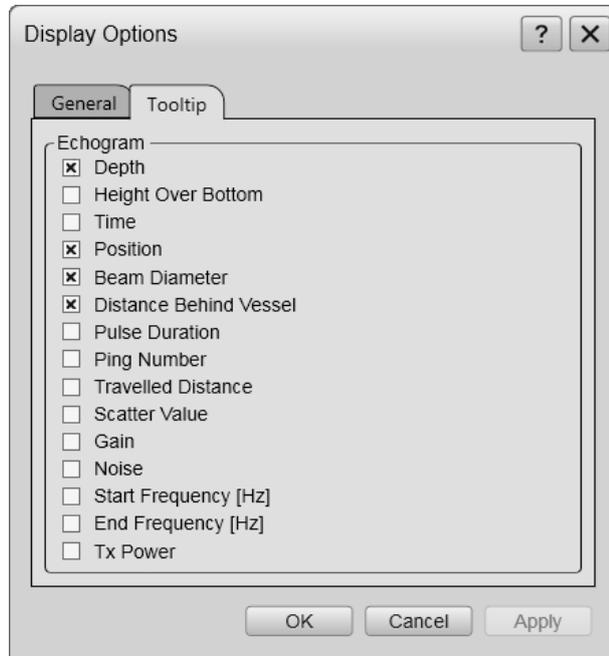
The **Tooltip** page offers a range of "on/off switches". Each tooltip is presented in the list, and you can enable or disable each of them independently.

Details

Tooltip

Several tooltips are shown on the EK80 presentation. When a tooltip is enabled, the cursor location is detected, and a small rectangle with information is shown. Each tooltip represent a specific piece of information, and they are listed separately.

Click each box to activate or deactivate the tooltip information.



Note

*The information provided for **Noise** provides the noise reading for the latest ping independent of the cursor's location on the EK80 presentation.*

Related topics

[Selecting which tooltips to appear in the user interface, page 150](#)

Colour Setup dialog box

The **Colour Setup** dialog box allows you to select the presentation colours used by the EK80.



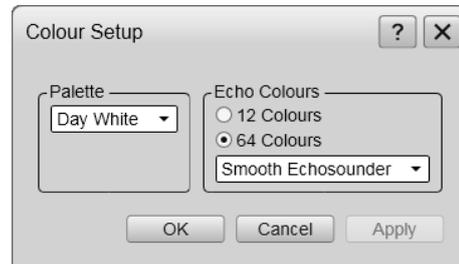
How to open

This dialog box is opened from the **Display** menu.

Description

The **Colour Setup** dialog box provides two fields.

- The **Palette** field is used to select the overall colour theme used by the EK80 presentation.
- The **Echo Colours** field allows you to choose how many colours to use, and which colour scale. The resulting colours can be seen in the colour scale 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 clicking the **Colour Scale** icon on the top bar.*

The currently selected colour scale is shown at the bottom of the EK80 presentation.

*Which colour scale to use is defined in the **Colour Setup** dialog box on the **Display** menu.*

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. This dialog box is opened from the **Colour Scale** information pane. You can also find the same parameters in the **Information Pane Options** dialog box on the **Active** menu.*



Details

Palette

The **Palette** function provides you with options for the colour theme ("skin") used by the EK80. Select a palette to suit the ambient light conditions and your personal preferences.

The choice you make here does not have any effect on the EK80 performance.

The options are:

- **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.

Tip

*To reduce the intensity of the display presentation, you can also try the **Screen Brightness** function on the **Display** menu.*

Echo Colours

Set the number of colours to use in the EK80 presentations; 12 or 64.

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 topics

[Choosing echogram colours, page 131](#)

[Changing the colour palette used in the EK80 presentations, page 152](#)

[Display menu, page 315](#)

Add Floating Window dialog box

The **Add Floating Window** dialog box allows you to grab a complete echogram presentation for a chosen channel, and place it in a separate window. This window can for example be moved to a separate display on a Processor Unit using two or more displays.



How to open

This dialog box is opened from the **Display** menu.

Description

Computers with graphic adapters supporting more than one display are fairly common. The **Add Floating Window** function has been implemented to allow you to enjoy echogram presentations on multiple displays.

The function is also useful if your Processor Unit is only fitted with a single display.

To move a chosen echogram to a separate window, and then - if applicable - to another display, simply choose the channel (identified with its transducer), and click **Ok**. The new window contains the chosen echogram, and you can move this window using the functionality provided by the operating system.

To close the window, click the "X" in its top right corner.

Related topics

[Display menu, page 315](#)



Setup menu: Functions and dialog boxes

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

How to open

Click once on the icon under the **Main** menu to open the **Setup** menu.

Click one more time on the icon to close the menu.



Description

- **Environment**

The **Environment** dialog box allows you to adjust the parameters related to salinity, sound speed and water temperature.

- **Manual Annotation**

The **Manual Annotation** dialog box allows you to type a text string. Once you click **OK**, the text string is added to your echogram.

- **Calibration**

The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.

- **Calculation Interval**

The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.

- **Installation**

The **Installation** dialog box allows you to control basic operational parameters related to EK80 installation and operation.

- **Transducer**

The **Transducer** page allows you to select the transducers you wish to use with your EK80 Scientific wide band echo sounder. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these.

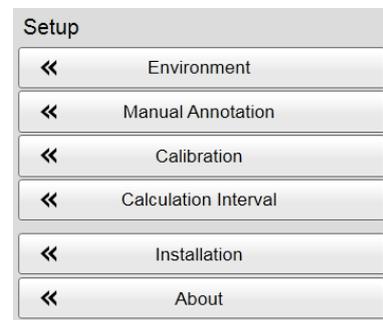
- **Transceiver**

The purpose of the **Transceiver** parameters are to define the necessary settings to connect the Processor Unit to the transceiver(s) and the transducer(s).

- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

- **Synchronization**



The purpose of the **Synchronization** parameters are 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.

– **Units**

The parameters on the **Units** page allow you to control the units of measurements used by the EK80.

– **Navigation**

The **Navigation** pages control how the EK80 receives information from external peripherals, such as positioning and/or gyro compass systems. The information provided by these systems are shown in the top bar.

– **Trawl**

The **Trawl** page allows you to enter the key parameters related to the trawl. The information is used to show the upper and lower trawl lines in the echogram.

– **Annotations**

The settings on the **Annotations** page allow you to type comments and annotations into the echograms.

– **Remote Control**

The **Remote Control** parameters allow you to set up the remote controlled operation of the EK80. The parameters define both how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this system.

– **Software License**

The purpose of the **Software License** page is to allow you to type the necessary license codes (text strings) to unlock the EK80 functionality.

• **About**

The **About** dialog box allows you to see the current EK80 software version.

Topics

[Environment dialog box, page 377](#)

[Manual Annotation dialog box, page 379](#)

[Calibration function, page 379](#)

[Calculation Interval dialog box, page 381](#)

[Installation dialog box, page 382](#)

[Transducer page, page 384](#)

[Transceiver page, page 386](#)

[Synchronization page, page 396](#)

[Units page, page 398](#)

[Navigation pages, page 399](#)

[Trawl page, page 406](#)

[Annotations page, page 407](#)

[Remote Control pages, page 409](#)

[Software License page, page 413](#)

[About dialog box, page 415](#)

Environment dialog box

The **Environment** dialog box allows you to adjust the parameters related to salinity, sound speed and water temperature.



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 the sound speed is unknown, use the default setting 1494 m/s. This is a typical mean value.

Note

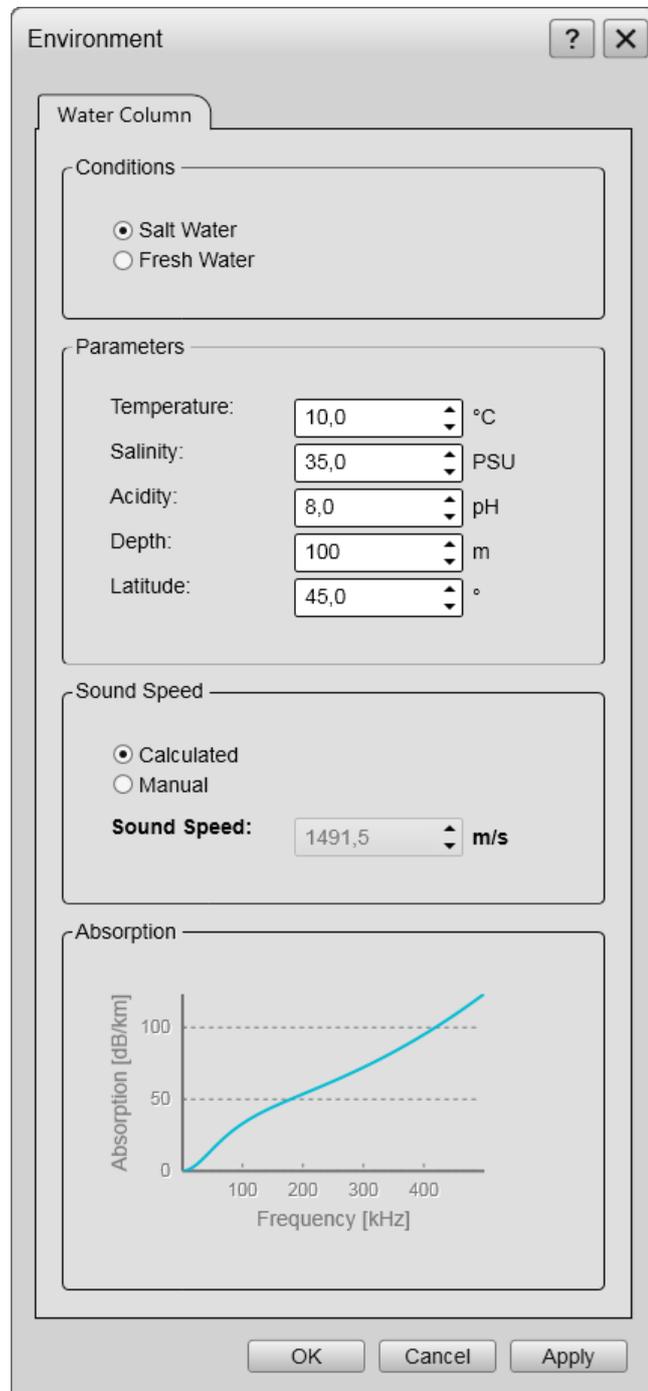
The values for acidity, depth and latitude are included because they are used in the algorithms that calculate the sound speed and the absorption. However, these values do not have a significant effect on the results. You may safely use the default values. The values can be modified later when the raw data is computed in a post-processing system.

Details

Conditions

Click to select fresh or salt water.

The salinity in the salt water is defined separately.



Temperature

Provide the current water temperature.

The temperature value you provide is an important parameter used to calculate the sound speed and the absorption curve.

You can input any temperature between 0 and +40°C.

Salinity

Provide the current salinity.

You can input any salinity value between 0 and +40 PSU.

The salinity value you provide is an important parameter used to calculate the sound speed and the absorption curve.

Acidity

The equations used to calculate the sound speed and the absorption curve requires a acidity value.

Unless you have any specific reasons to apply a specific value, use the default value of 8 pH.

You can input any value between 7.8 and 8.2 pH.

Depth

The equations used to calculate the sound speed and the absorption curve requires a depth value. This is the current depth under the keel.

Unless you have any specific reasons to apply a specific value, use the default value of 100 meters.

You can input any value between 0 and 10,000 meters.

Latitude

The equations used to calculate the sound speed and the absorption curve requires a latitude value. This is the vessel's geographical latitude.

Unless you have any specific reasons to apply a specific value, use the default value of 45 degrees.

Sound Speed

Select **Manual** to select your own sound speed value. Select **Calculated** to allow the EK80 to calculate the sound speed and the absorption based on the parameters you have supplied.

Absorption

The absorption curve is calculated using the parameters provided.

Related topics

[Verifying or changing the environmental parameters, page 102](#)

[Numerical information pane - Environment list, page 275](#)

[Main menu, page 316](#)

[Sound speed algorithms, page 465](#)

[Absorption algorithm, page 466](#)

Manual Annotation dialog box

The **Manual Annotation** dialog box allows you to type a text string. Once you click **OK**, the text string is added to your echogram.



How to open

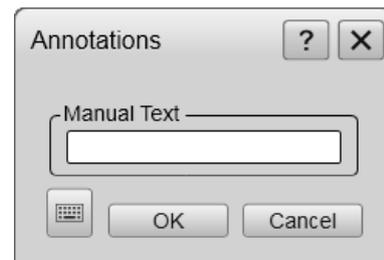
This dialog box is opened from the **Setup** menu.

Description

Type any text into the box. The size of the box will adjust to the length of your text.

Tip _____

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*



The **Manual Annotation** dialog box may be opened during replay, but you will not be able to place text annotations on a pre-recorded echogram.

Related topics

[Main menu, page 316](#)

Calibration function

The purpose of the **Calibration** button is to start the "wizard" that takes you through the calibration process.



Prerequisites

The calibration process - with the **Calibration Wizard** dialog box - can only be started with the EK80 in either *Normal* or *Replay* mode.

How to open

This function is activated on the **Setup** menu.

Description

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 then compared with the known target strength. During the calibration, the calibration sphere is physically moved inside the sound beam.

If it is necessary to adjust the EK80, this is done automatically by the calibration software. No analogue gain adjustments are required.

The **Calibration Wizard** offers four 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 and the calibration target (sphere) that are used. You can also add or delete spheres, and modify their parameters.
- 3 The third 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.
- 4 The fourth 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.

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.

Note

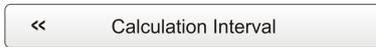
Each calibration sphere must be handled with care to avoid any damage to its surface. When not in use, store the sphere in a household soap solution. All suspension lines must be as thin and clean as possible. Limit knots to a minimum, and keep them small. Even knots have strong echoes!

Related topics

[Main menu, page 316](#)

Calculation Interval dialog box

The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.



How to open

The **Calculation Interval** parameters can be accessed from two places in the EK80 user interface.

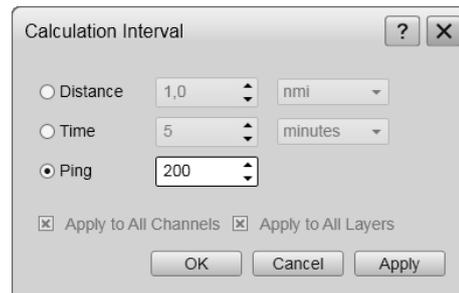
- The **Calculation Interval** page can be opened from the **Information Pane Options** dialog box. To open this dialog box, click the **Information Pane Options** button on the **Active** menu, or the **Setup** button in an information pane. 
- The **Calculation Interval** dialog box can be opened from the **Calculation Interval** button on the **Setup** menu

The parameters are the same, it does not matter from where you open the page or the dialog box.

Description

The biomass and size distribution values are calculated based on the echo data collected by the EK80.

Using the **Calculation Interval** options, you can limit the source data used by these calculations. You can thus specify if you wish to base the calculations on data collected during a given timeframe, from a defined number of pings, or from the data used to create a portion of the current echogram view.



Distance

This option allows you to calculate the biomass and fish distribution based on the echo data collected during a sailed distance.

You can select any distance in nautical miles or meters.

Time

This option allows you to calculate the biomass and fish distribution based on the echo data collected during the last elapsed seconds or minutes.

You can select any time (in hours, minutes and seconds).

Ping

This option allows you to calculate the biomass and fish distribution based on the echo data collected during the latest number of "pings".

Related topics

[Information Pane Options dialog box, page 443](#)

[Biomass information pane, page 268](#)

[Main menu, page 316](#)

[Active menu, page 318](#)

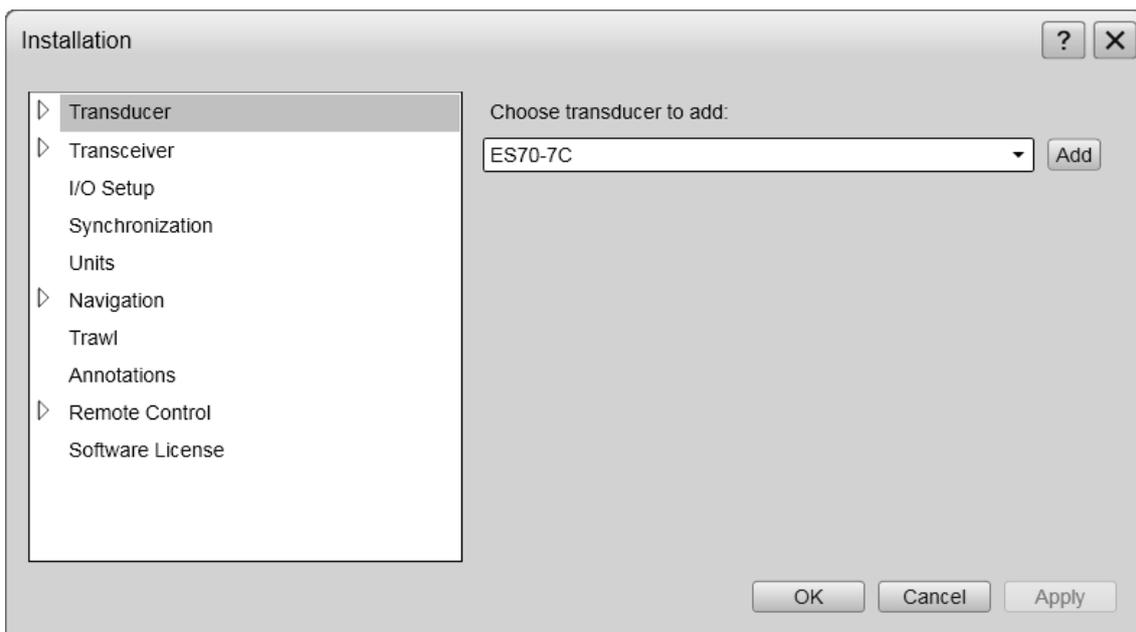
Installation dialog box

The **Installation** dialog box allows you to control basic operational parameters related to EK80 installation and operation.



How to open

This dialog box is opened from the **Setup** menu.



Description

The **Installation** dialog box offers a menu on the left side, and several pages for operational parameters on the right side.

Tip

*The **I/O Setup** page can also be opened from the **Outputs** dialog box on the **Operation** menu.*

- **Transducer**

The **Transducer** page allows you to select the transducers you wish to use with your EK80 Scientific wide band echo sounder. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these.

- **Transceiver**

The purpose of the **Transceiver** parameters are to define the necessary settings to connect the Processor Unit to the transceiver(s) and the transducer(s).

- **I/O Setup**

The **I/O Setup** parameters allow you to define which data are that imported on each of the available Ethernet and serial ports on the EK80 Processor Unit. For each port, you can also set up the communication parameters, and monitor the data flow.

- **Synchronization**

The purpose of the **Synchronization** parameters are 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.

- **Units**

The parameters on the **Units** page allow you to control the units of measurements used by the EK80.

- **Navigation**

The **Navigation** pages control how the EK80 receives information from external peripherals, such as positioning and/or gyro compass systems. The information provided by these systems are shown in the top bar.

- **Trawl**

The **Trawl** page allows you to enter the key parameters related to the trawl. The information is used to show the upper and lower trawl lines in the echogram.

- **Annotations**

The settings on the **Annotations** page allow you to type comments and annotations into the echograms.

- **Remote Control**

The **Remote Control** parameters allow you to set up the remote controlled operation of the EK80. The parameters define both how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this system.

- **Software License**

The purpose of the **Software License** page is to allow you to type the necessary license codes (text strings) to unlock the EK80 functionality.

Related topics

- [Transducer page, page 384](#)
- [Transceiver page, page 386](#)
- [Transceiver Installation page, page 387](#)
- [Transceiver IP Address page, page 393](#)
- [I/O Setup page, page 349](#)
- [Synchronization page, page 396](#)
- [Units page, page 398](#)
- [Navigation pages, page 399](#)
- [Trawl page, page 406](#)
- [Annotations page, page 407](#)
- [Remote Control pages, page 409](#)
- [Software License page, page 413](#)
- [Setting up the input from a navigation system, page 164](#)
- [Setting up the input from a Motion Reference Unit \(MRU\), page 168](#)
- [Setting up the input from a sound speed sensor, page 170](#)
- [Setting up a serial line for annotation input, page 172](#)
- [Setting up the EK80 in a synchronized system, page 180](#)
- [Obtaining and installing the software license, page 183](#)
- [Moving the software license from one computer to another, page 185](#)
- [Installing one or more transducers, page 188](#)
- [Installing transceiver channels, page 189](#)
- [Disconnecting transceiver channels, page 191](#)
- [Main menu, page 316](#)

Transducer page

The **Transducer** page allows you to select the transducers you wish to use with your EK80 Scientific wide band echo sounder. Which transducers to use depends on the number of transceivers in your system, and the licenses you have for these.

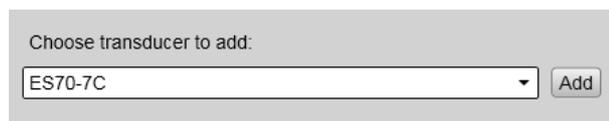
How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

On the **Transducer** page, select a transducer from the list, and then click **Add**.



The list of transducers is generated from a system file on your Processor Unit. It contains all transducers compatible with the Wide Band Transceiver (WBT) as well as key technical information about each transducer.

When you click **Add**, the **Add Transducer** dialog box opens. This dialog box allows you to identify your chosen transducer with a serial number and a custom name.

The name you select will only be used to identify the transducer in other dialog boxes. It will not be reflected in raw or processed data that you export.

Once a transducer has been defined, it will be listed in the collapsed menu on the left side of the **Installation** dialog box. To see the relevant transducer information, click on the menu entry. The parameters collected by the **Add Transducer** dialog box are then shown.

This page contains a Remove button that allows you to remove the transducer from the EK80 configuration.

Details

Choose transducer to add

The list of transducers is generated from a system file on your Processor Unit. It contains all transducers compatible with the Wide Band Transceiver (WBT) as well as key technical information about each transducer.

Add

When you have selected a transducer from the list, click this button to open the **Add Transducer** dialog box.

Model

This text box identifies the model (initial product name) of the transducer you have chosen. You can not change the text in this box.

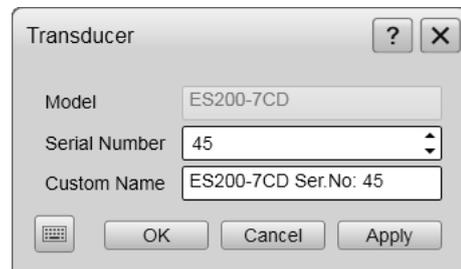
Serial Number

Use this text box to insert the transducer's serial number.

This serial number is very important, because you will need it as a reference identification when the EK80 Scientific wide band echo sounder is calibrated.

Tip

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*



Custom Name

Type any name that you wish to use.

The name you select will only be used to identify the transducer in other dialog boxes. It will not be reflected in raw or processed data that you export.

Related topics

[Installation dialog box, page 382](#)

[Installing one or more transducers, page 188](#)

[Main menu, page 316](#)

Transceiver page

The purpose of the **Transceiver** parameters are to define the necessary settings to connect the Processor Unit to the transceiver(s) and the transducer(s).

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

The **Transceiver** pages control the installation and disconnection of transceivers. The parameters are located on two pages in the **Installation** dialog box.

- **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.

- **Transceiver IP Address**

For advanced users, the **Transceiver IP Address** page provides you with the ability to control the IP addresses defined by the BOOTP server in the Processor Unit software. This BOOTP server controls the IP address that are assigned to each transceiver.

You can also initiate a search for transceivers by clicking the **Browse** button. To connect to an available frequency channel, select the correct transducer on an available channel.

Tip

*Parameters related to transmission and transducer depth are controlled in the **Normal Operation** dialog box.*

Topics

[Transceiver Installation page, page 387](#)

[Transceiver IP Address page, page 393](#)

[Transceiver Installation page, page 387](#)

[Transceiver IP Address page, page 393](#)

Transceiver Installation page

The **Transceiver Installation** page provides you with an overview of the frequency channels currently available. If you have many transceivers connected you can change the size of the dialog box, or you can use the two arrows on the right hand side of the frequency channel list to scroll up and down. The **Transceiver Information** field provides you with an overview of the technical parameters of the chosen frequency channel, while the **Browser** field parameters are used when you wish to start an automatic search for transceivers on the network. The communication is made between your computer (identified with its Local IP Address) and one or more transceivers.

Description

The following main parameter fields are provided on the **Transceiver Installation** page:

- **Frequency channels**

The phrase frequency channel is used to identify the combination of a transceiver, transducers and the frequencies offered.

The frequency channel list on the top of the **Transceiver Installation** page provides you with an overview of the frequency channels currently available.

If you have many transceivers connected you can change the size of the dialog box, or you can use the two arrows on the right hand side of the list to scroll up and down.

For each channel on the list, a status label is provided.

- **Transceiver information**

The **Transceiver Information** field provides you with an overview of the technical parameters of the chosen frequency channel. If you click one of the frequency channels in the channel list, the information is listed.

Note

*The information provided in the **Transceiver Information** field is not required for operational use.*

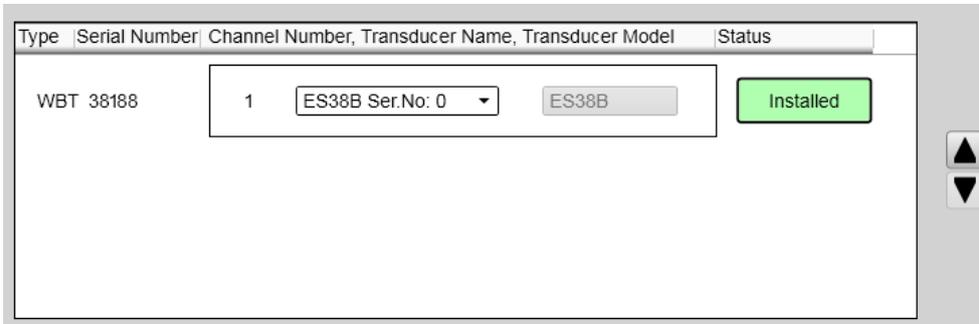
You may also choose to change the IP address on the transceiver, and download software to upgrade it. Software updates are only available if and when distributed with the EK80 operational software.

- **Transceiver Browsing**

The **Browser** parameters are used when you wish to start an automatic search for transceivers on the network. The communication is made between your computer (identified with its Local IP Address) and one or more transceivers.

To search your network for transceivers, check that the IP address of your computer's Ethernet board is shown, and click the **Browse** button. All transceivers connected to the computer through the network are automatically listed in the channel list. Each transceiver is identified with its applicable status label.

At the bottom of the **Transceiver Browsing** field, you can set up the EK80 to automatically scan for new software versions for the transceiver. Software updates for the transceiver are distributed with the EK80 operational software.



Details

Frequency channels

This is the "table" at the top of the **Transceiver Installation** page.

The following information is provided:

- Type (of transceiver)
- Transceiver's serial number
- Channel number
- Transducer identification
- Transducer model
- Status label

Type (of transceiver)

This column identifies the type of transceiver in use and/or currently available for the EK80.

- "GPT" means "General Purpose Transceiver"
- "WBT" means "Wide Band Transceiver"
- "SBT" means "Single Band Transceiver"

Serial number

This is the serial number of the transceiver. This number is fixed, and it can not be changed.

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 name you defined when you added the transducer to the EK80 system using the **Transducer** page.

The spin-box is used to select transducer. The transducer must be first be selected on the **Transducer** page to appear on this list.

If you can not find your transducer on **Transducer** page, contact you dealer, agent or Simrad to upgrade the relevant software component in the EK80.

Transducer Model

This field shows the actual product name of the transducer. You are not able to change this information

Status

The current status of the frequency channel is shown with a rectangular label.

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

Change IP address

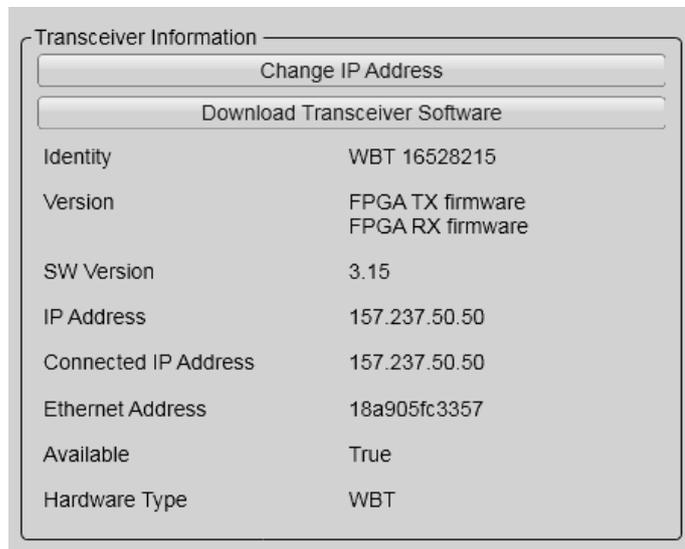
Each Wide Band Transceiver (WBT) is provided with a unique IP addresses from the Processor Unit. This button is therefore not used on the EK80.

Download Transceiver Software

It is possible to update the software in the transceiver.

This update is only necessary if new

functionality in the EK80 software requires a newer software version. The software release note provided will then include the necessary instructions. Transceiver software update can also be useful if you have an old unit.



Identity

This information reflects the type of transceiver connected, and the transceiver's unique Ethernet address.

- "GPT" means "General Purpose Transceiver"
- "WBT" means "Wide Band Transceiver"
- "SBT" means "Single Band Transceiver"

Version

This information includes the unique version parameters provided by the transceiver. Codes identifying frequency, serial number and firmware are provided.

SW Version

This is the software version currently running on the transceiver.

IP address

This is the transceiver's current IP address.

Note

If you use more than one transceiver with the same frequency, you must set up these transceivers to provide different IP addresses.

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*.

Hardware Type

This parameter identifies the type of transceiver.

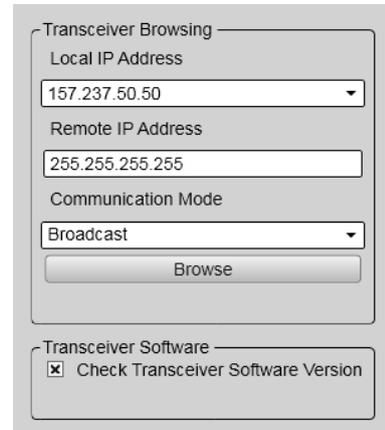
- "GPT" means "General Purpose Transceiver"
- "WBT" means "Wide Band Transceiver"
- "SBT" means "Single Band Transceiver"

Local IP Address

This is the Internet Protocol (IP) address of the local Ethernet interface adapter in your Processor Unit. If you have more than one interface adapter, you are provided with a list of the available addresses.

If you have more than one Ethernet adapter in your Processor Unit, set up one adapter to communicate with the transceiver(s) using the IP address and Subnet mask shown, and the other adapter to communicate with another local area network. You must use the operating system's functionality to set up these IP addresses.

The EK80 will automatically assign the remote IP addresses to the transceiver(s) you have connected to the Processor Unit.



The screenshot shows a dialog box titled "Transceiver Browsing". It contains the following elements:

- A section titled "Local IP Address" with a dropdown menu showing "157.237.50.50".
- A section titled "Remote IP Address" with a text input field containing "255.255.255.255".
- A section titled "Communication Mode" with a dropdown menu showing "Broadcast".
- A "Browse" button.
- A section titled "Transceiver Software" with a checked checkbox labeled "Check Transceiver Software Version".

Remote IP Address

Select the Internet Protocol (IP) address for the remote transceiver.

If you wish to locate a transceiver using *Point-to-Point* communication, type the Internet Protocol (IP) address for the transceiver.

If you don't know the transceiver's IP address, leave this field blank, and use *Broadcast* communication.

Communication mode

Choose *Broadcast* or *Point-to-Point*.

Use *Broadcast* if you do not know the Internet Protocol (IP) address of the transceiver.

Use *Point-to-Point* if you know the Internet Protocol (IP) address of the transceiver. You must then type the transceiver's IP address into the **Remote IP Address** field.

Browse

This button initiates a search on the network for available transceivers. The transceivers that are found are automatically listed in the channel list with their appropriate statuses.

Transceiver Software

At the bottom of the **Transceiver Browsing** field, you can set up the EK80 to automatically scan for new software versions for the transceiver. Software updates for the transceiver are distributed with the EK80 operational software.

Related topics

[Installation dialog box, page 382](#)

[Installing transceiver channels, page 189](#)

[Disconnecting transceiver channels, page 191](#)

Transceiver IP Address page

For advanced users, the **Transceiver IP Address** page provides you with the ability to control the IP address(es) defined by the BOOTP server in the Processor Unit and assigned to the transceiver(s).

Description

In order to establish communication between the Processor Unit and the transceiver(s), each of the units must have unique IP addresses. The software in the Processor Unit includes a function that automatically defines and assigns one IP address to each transceiver.

The IP address in the computer can either be fixed, or automatically obtained from a network. To control this, click **Control Panel**→**Network and Sharing Center**→**Change Adapter Settings**, and set up the TCP/IP4 parameters.

Tip

If you wish to have your Processor Unit connected both to the ship's network and to a number of transceivers, we strongly advise you to use two Ethernet adapters. Use one for the ship's network, and allow it to obtain its IP address automatically. Use the other Ethernet adapter to communicate with the transceiver(s), and define your own IP address.

The IP Address assigned to each transceiver will automatically use the same address range as the address given to the Processor Unit. Advanced users 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.

Details

Bootp Activity

The Wide Band Transceiver (WBT) is not provided with a fixed IP Address for Ethernet communication. In order to establish this communication channel, the EK80 Processor Unit will assign an address, and then send it to the transceiver. This happens automatically when the transceiver is connected, since the Processor Unit software includes a BOOTP configuration server.

Bootp Activity

Bootp Active

Transceiver IP4 Range

Minimum: 100 Maximum: 200

Processor Unit IP: 157.237.52.61

Transceiver IP:

IP - 1	IP - 2	IP - 3	IP - 4
157	237	52	100 - 200

Reset

Note

*This automatic assignment of an IP address to the transceiver will only work when **Bootp Active** is enabled.*

If you have several transceivers connected to your Processor Unit, each transceiver will automatically be assigned a unique IP address.

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 protocol 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.

http://en.wikipedia.org/wiki/Bootstrap_Protocol (October 2014)

Transceiver IP4 Range

Note _____

This function is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

On large networks, you may wish to limit the range of the IP address(es) provided to the 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 below.

(Table)

Note _____

This function is provided for advanced users. We assume that you are familiar with Ethernet communication and the relevant parameters.

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 interface adapter.
- **IP-3** is chosen using the spin box.
- The **IP-4** range is controlled by the **Transceiver IP4 Range** parameters.

Reset

Use this **Reset** function to restore all IP Address settings to their default values.

Related topics

[Installation dialog box, page 382](#)

Synchronization page

The purpose of the **Synchronization** parameters are 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.

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

Whenever more than one hydroacoustic system is installed on a vessel, interference may occur. To avoid this, the systems may either be connected to a common synchronization system, or one of the acoustic systems may be defined as a "master", and control the transmission on the other system(s).

The EK80 includes interface for remote transmit synchronisation. It can be set up to operate in either *Master* or *Slave* mode in relation to an external synchronization or an other hydroacoustic system.

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.

Wikipedia 2011

Details

Synchronization

Choose which synchronization mode to use.

- **Standalone**

This synchronization mode is used if the EK80 is working by itself, and with no synchronization required. This is the default setting. The EK80 will operate using its internal ping interval parameters, independent of any signals arriving at the synchronization port.

- **Master**

This mode is used if the EK80 shall act as a "Master" unit in a synchronized system. The peripheral hydroacoustic system(s) will then only be permitted to transmit when enabled by the EK80. When this mode is chosen, the EK80 will run using its internal ping interval parameters, and transmit external trigger signals to the peripheral system(s) on the synchronization port.

- **Slave**

This mode is used if the EK80 shall transmit only when permitted by a peripheral device. When this mode is chosen, the EK80 will wait for an external trigger to appear on the chosen synchronization port before each ping. The peripheral device may be any other hydroacoustic system (for example an echo sounder or sonar), or even a dedicated synchronisation system.

Note

The synchronization mode is not fixed. It can be changed at any time during EK80 operation.

Synchronization delay

This delay parameter is used differently depending on the chosen synchronization mode.

- **Standalone**

The **Synchronization Delay** is not applicable when synchronization is switched off.

- **Master**

The EK80 will wait 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 *Pre-trigger*.

Note that this delay will only work when the synchronization is set up using a serial port.

- **Slave**

The EK80 will wait for the delay time after the external trigger signal has arrived before transmitting the ping. This is often referred to as *Post-trigger*.

Synchronization port

This is the interface port currently used to transmit or receive synchronization signals.

This must be a serial port. Since the synchronization function only use the Request To Send (RTS) and Clear To Send (CTS) signals, you can use a serial port that is already used for other purposes. For the same reason, you do need to define any baud rate.

Related topics

[Installation dialog box, page 382](#)

[Setting up the EK80 in a synchronized system, page 180](#)

[Main menu, page 316](#)

Units page

The parameters on the **Units** page allow you to control the units of measurements used by the EK80.

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

The EK80 is prepared to work with several standards for units of measurements.

Use the **Units** options to set up the various units of measurements you wish to work with. The EK80 will use these in all presentations. Normally, you will only need to define these once.

Use the drop down lists provided to make the selections.

You can adjust the measurement units for:

- Length
- Depth
- Distance
- Speed
- Temperature

Details

Length

The length type is used for all presentation readouts such as cursor or range rings.

Depth

Choose the unit of measurement for water depth.

Distance

Choose the unit of measurement for sailed distance.

Speed

Choose the unit of measurement for speed readout.

Temperature

Choose the unit of measurement for water temperature.

Unit Type	Selected Unit
Length	metre
Depth	metre
Distance	Nautic Miles
Speed	knots
Temperature	Celsius
	Celsius
	Fahrenheit

Related topics

[Installation dialog box, page 382](#)

[Selecting measurement units, page 153](#)

[Main menu, page 316](#)

Navigation pages

The **Navigation** pages control how the EK80 receives information from external peripherals, such as positioning and/or gyro compass systems. The information provided by these systems are shown in the top bar.

How to open

This page - and the sub-pages - are located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

Several external sensors (GPS navigation, gyro compass etc) may be connected to the EK80 to provide information about the vessel's speed, position, heading and sailed distance. The EK80 must be set up to receive this information. The interface ports must be defined, and the format of the information must be selected. The **Navigation** parameters are provided to set up these communication settings.

The **Navigation** parameters are located on four pages in the **Installation** dialog box.

- **Position**

The parameters on the **Position** page allows you to control the interface with external positioning sensors.

- **Speed**

The parameters on the **Speed** page allows you to control the interface with external speed sensors. You can also define a manual speed value.

- **Distance**

The parameters on the **Distance** page allows you to control the interface with external sensors measuring the sailed distance.

- **Heading**

The parameters on this **Heading** page allows you to control the interface with external heading sensors. You can also define a manual heading value.

Note

*The properties of the interface ports are defined on the **IO Setup** page in the **Outputs or Installation** dialog boxes.*

Topics

[Position page, page 400](#)

[Speed page, page 402](#)

[Distance page, page 403](#)

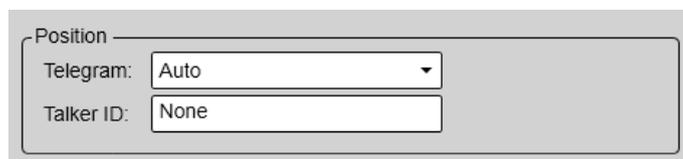
[Heading page, page 405](#)

Position page

External positioning sensors are typically global positioning systems (GPS). These provide their data on a serial line, or by means of the local area network.

Description

The information from the GPS system provides the position information on the EK80 top bar.



Position

Telegram: Auto

Talker ID: None

Note

*The properties of the interface ports are defined on the **IO Setup** page in the **Outputs or Installation** dialog boxes.*

Details

Telegram

Select which NMEA, third party or proprietary datagram format to be used for the communication.

Talker ID

If you wish to specify a dedicated Talker ID on the datagram format, it can be selected 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 defines the type of message. The Talker ID identifies the system that sends the datagram. You may leave this field blank, which means that two blank characters are inserted into the datagram, or you may 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 some 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, click the **Keyboard** button to open an on-screen keyboard.*

Supported datagram formats for position information

The EK80 supports the following datagram formats for position information.

- **Auto**

This choice allows the EK80 to read all relevant datagrams. If the specified information is provided to the EK80 on more than one datagram format, a built-in priority list will be used.

- **NMEA GGA**

The NMEA GGA datagram transfers the time, position and fix related data from a global positioning system (GPS).

- **NMEA GLL**

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

- **NMEA RMC**

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Related topics

[Setting up the input from a navigation system, page 164](#)

[NMEA GGA datagram, page 530](#)

[NMEA GLL datagram, page 531](#)

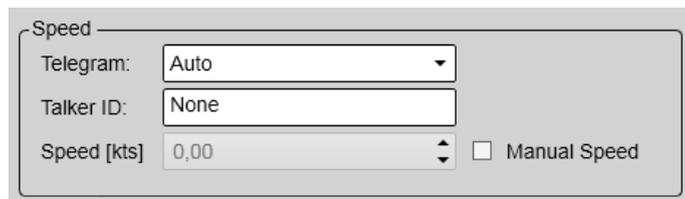
[NMEA RMC datagram, page 532](#)

Speed page

External speed sensors are typically global positioning systems (GPS) or dedicated speed sensors. They provide their data on a serial line, or by means of the local area network. You can also define the vessel's speed manually.

Description

The information from the speed sensor provides the speed information on the EK80 top bar.



Note

*The properties of the interface ports are defined on the **IO Setup** page in the **Outputs or Installation** dialog boxes.*

Details

Telegram

Select which NMEA, third party or proprietary datagram format to be used for the communication.

Talker ID

If you wish to specify a dedicated Talker ID on the datagram format, it can be selected 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 defines the type of message. The Talker ID identifies the system that sends the datagram. You may leave this field blank, which means that two blank characters are inserted into the datagram, or you may 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 some 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".

Speed / Manual speed

If you do not have any information from a speed sensor, or if you wish to enter the vessel's speed manually, you can click this box. When it is enabled, you can set the vessel speed manually using the **Speed** spin box.

Supported datagram formats for speed information

The EK80 supports the following datagram format for speed information.

- **Auto**

This choice allows the EK80 to read all relevant datagrams. If the specified information is provided to the EK80 on more than one datagram format, a built-in priority list will be used.

- **NMEA RMC**

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Related topics

[Setting up the input from a navigation system, page 164](#)

[NMEA RMC datagram, page 532](#)

Distance page

External distance sensors are typically global positioning systems (GPS) or dedicated distance sensors. They provide their data on a serial line, or by means of the local area network.

Description

On the EK80, you can select from which source you wish to receive the distance information. The following options are available:

- **None**

No distance information is accepted.

- **Speed**

The distance information is calculated using the speed information received by the EK80. It will always start with the previously calculated distance. If you need to reset this to zero (or any other value), set the **Distance** value to 0 (zero).

- **Sensor Input**

The distance information is received using appropriate datagram(s) from an external source.

Note

*The properties of the interface ports are defined on the **IO Setup** page in the **Outputs or Installation** dialog boxes.*

Details

Source

Choose from which source you wish to retrieve or calculate the distance information.

Talker ID

If you wish to specify a dedicated Talker ID on the datagram format, it can be selected 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 defines the type of message. The Talker ID identifies the system that sends the datagram. You may leave this field blank, which means that two blank characters are inserted into the datagram, or you may 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 some 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, click the **Keyboard** button to open an on-screen keyboard.*

Distance

The current vessel distance can be set manually using the spin box.

This parameter is not available if **Source** is set to *None* or *Sensor Input*.

Supported datagram formats for distance information

The EK80 supports the following datagram format for vessel distance information.

- **NMEA VLW**

The NMEA VLW datagram contains the travelled distance of the vessel. Two values are provided; relative to the water and over the ground.

Related topics

[Setting up the input from a navigation system, page 164](#)

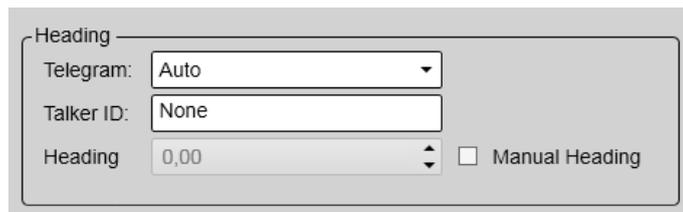
[NMEA VLW datagram, page 533](#)

Heading page

External heading sensors are typically global positioning systems (GPS) or dedicated gyro or compass systems. They provide their data on a serial line, or by means of the local area network.

Description

The information from the heading sensor provides the heading information on the EK80 top bar.



Note

*The properties of the interface ports are defined on the **IO Setup** page in the **Outputs or Installation** dialog boxes.*

Details

Telegram

Select which NMEA, third party or proprietary datagram format to be used for the communication.

Talker ID

If you wish to specify a dedicated Talker ID on the datagram format, it can be selected 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 defines the type of message. The Talker ID identifies the system that sends the datagram. You may leave this field blank, which means that two blank characters are inserted into the datagram, or you may 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 some 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, click the **Keyboard** button to open an on-screen keyboard.*

Heading / Manual heading

If you do not have any information from a heading sensor, or if you wish to enter the vessel's heading manually, you can click this box. When it is enabled, you can set the vessel heading manually using the **Heading** spin box.

Supported datagram formats for heading information

The EK80 supports the following datagram format for vessel heading information.

- **NMEA RMC**

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Related topics

- [Setting up the input from a navigation system, page 164](#)
- [NMEA RMC datagram, page 532](#)

Trawl page

The **Trawl** page allows you to enter the key parameters related to the trawl. The information is used to show the upper and lower trawl lines in the echogram.

How to open

This page is located in the **Installation** dialog box. To open, click **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.



Trawl information is used for display of an upper and/or lower trawl line in the echogram. All received data are stored to file when recording of raw data is enabled.

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.

Tip

*To set up the interface parameters between the trawl or catch monitoring system and the EK80, use the **I/O Setup** page in the **Installation and Output** dialog boxes.*

Details

Trawl Opening

Click to allow manual data entry.

Input the height of the trawl opening.

Physical properties

Click to allow manual data entry.

Input the distance between the vessel and the trawl.

Related topics

[Installation dialog box, page 382](#)

[Main menu, page 316](#)

Annotations page

The settings on the **Annotations** page allow you to type comments and annotations into the echograms.

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

Several different annotation types may be added to the echogram. The annotations defined are stored with the raw data as annotation datagrams. They are displayed on the echogram if this feature is enabled in the **Echogram** dialog box.

Note

Annotations can only be added to the echogram while in Normal operational mode.

Details

Event

The **Event** parameters initiate annotations whenever something happens. Events may be triggered by external devices, set by a timer, or initiated by clicking 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 this feature 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.

Tip

*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*

Timer

Set a time period for automatic generation of events.

Last annotation

This text box automatically displays the latest annotation text that was typed.

Supported datagram formats for annotations

The EK80 supports the following datagram format for annotations.

- **Simrad ATS**

Simrad ATS is a proprietary datagram format created by Kongsberg Maritime. It allows you to import annotations from external devices.

Related topics

[Installation dialog box, page 382](#)

[Main menu, page 316](#)

[Simrad ATS datagram, page 534](#)

Remote Control pages

The **Remote Control** parameters allow you to set up the remote controlled operation of the EK80. The parameters define both how the EK80 can be controlled from a peripheral system, and how the EK80 can export information to this system.

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

The EK80 software and computer can function as a data server for client applications running on peripheral computers connected to the local area network (LAN). In this case data are transferred as user datagram protocol (UDP) packets from and to the EK80 server using an Ethernet adapter with a specific IP address.

Important

The **As Server** parameters are only used if you want to set up and use the EK80 Processor Unit as a server for such client applications.

The **Remote Control** parameters are located on three pages in the **Installation** dialog box.

- **Application Information**

These parameters allow you to control system specific information. This is typically the name (EK80) and type of product, as well as an identification number.

- **As Server**

These parameters are used when you wish to set up your EK80 as a server in a larger network. This is typically used when a second computer is installed somewhere else on the vessel to monitor - and control - EK80 operations.

- **As Client**

These parameters are used when you wish to set up your EK80 as a client in a larger network. The Processor Unit with the transceiver(s) connected to it is regarded as the server in the network.

Topics

[Application Information page, page 410](#)

[As Client page, page 411](#)

[As Server page, page 412](#)

Application Information page

The **Application Information** parameters allow you to control system specific information. This is typically the name (EK80) and type of product, as well as an identification number.

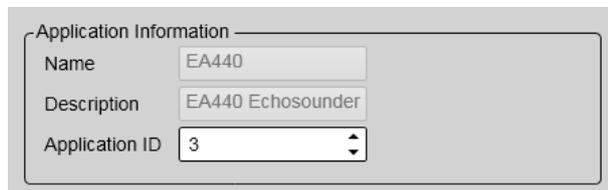
Description

The **Application Information** parameters includes product name and description, as well as an identification number. Only this identification number can be altered, the other parameters are fixed.

Details

Name

This is the name of your product (EK80). The name is fixed, and you are not permitted to change it.



The screenshot shows a configuration window titled "Application Information". It contains three fields: "Name" with the value "EA440", "Description" with the value "EA440 Echosounder", and "Application ID" with the value "3".

Application Information	
Name	EA440
Description	EA440 Echosounder
Application ID	3

Description

This is the type of product you are operating. The description is fixed, and you are not permitted to change it.

Application ID

This field allows you to enter a number. The number is used to recognize your EK80 system in the larger network.

As Client page

The **As Client** parameters are used when you wish to set up your EK80 as a client in a larger network. The Processor Unit with the transceiver(s) connected to it is regarded as the server in the network.

Description

The EK80 can function as a client receiving data from an application running on another computer connected to the local area network. In this case data are transferred as UDP packets from/to the client through an Ethernet adapter with a specific IP address.

The **As Client** parameters are only used if you want to use the EK80 as a client receiving data from another echo sounder program. If you have more than one network adapter you can select which one to use for client operations from the list of IP addresses.

The *remote port number* is the port number on the server (the EK80 Processor Unit that controls the transceiver) which is used to establish the initial connection. This number must be the same as the *local port number* found as **As Server** on the remote system which you wish to connect to.

Details

Local IP Address

This is the Internet Protocol (IP) address of the local Ethernet interface adapter. This is the adapter in your EK80 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 interface adapter, you are provided with a list of the available addresses.

Remote IP Address

This is the Internet Protocol (IP) address for the remote computer.

If the data communication between your EK80 Processor Unit and the remote computer is set up to only receive data on the Processor Unit, this parameter is not required.

If you wish to set up an output for broadcast from the Processor Unit to network computers, define IP address 255.255.255.255. This is the default setting.

If you use point-to-point communication in a closed network, you need to enter the remote IP address manually.

Remote Port

This port is important if you wish to transmit information from the Processor Unit to another computer on the network. The application on the remote computer will "listen" to this port number.

Communication Mode

Choose *Broadcast* or *Point-to-Point*.

Broadcast mode enables data to be sent from the EK80 Processor Unit to any number of remote systems. Data is thereby only transmitted to these systems. The remote systems receive the data, but the EK80 does not receive any reply or acknowledgement from them.

Point-to-Point mode implies that the EK80 Processor Unit is physically connected only to one single remote system. The value of such a permanent point-to-point network is unimpeded communications between the two EK80 and the remote system. A complete two-way communication system is then used.

As Server page

The **As Server** parameters are used when you wish to set up your EK80 as a server in a larger network. This is typically used when a second computer is installed somewhere else on the vessel to monitor - and control - EK80 operations.

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 echo sounder 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 appropriate IP address from the list. The initial connection between a server and a client is created through on 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 which 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 local Ethernet interface adapter. This is the adapter in your EK80 Processor Unit.

The screenshot shows a configuration window titled "As Server". It contains two input fields: "Local IP Address" with a dropdown menu showing "157.237.52.61" and "Local Port" with a spinner box showing "37655".

In most cases, each Ethernet adapter has a unique IP address, even when it supports multiple sockets. If you have more than one interface adapter, you are provided with a list of the available addresses.

Local Port

This port is important if you wish to receive information on the Processor Unit. The number you define here must match the port number on the remote computer.

To find the port number on the remote computer, consult the documentation for the software program to be used.

If the data communication is set up to only export information from the EK80 Processor Unit to a peripheral system, this **Local Port** parameter is not required.

Software License page

The purpose of the **Software License** page is to allow you to type the necessary license codes (text strings) to unlock the EK80 functionality.

How to open

This page is located in the **Installation** dialog box. To open, click **Installation** on the **Setup** menu.



Description

The software license is 32 character hexadecimal string built from the transceiver's serial number. It defines several key parameters that controls the functionality and behaviour of the transceiver(s) you use. The software license is not linked to the physical Processor Unit. You can therefore easily move the EK80 software from one computer to another, just remember to take a copy of the license string.

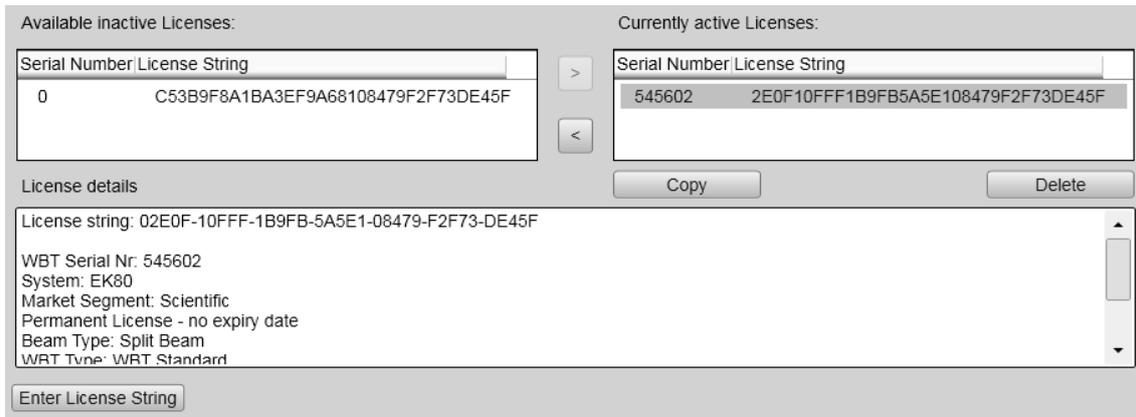
The basic license allows the EK80 Processor Unit to communicate with the transceiver(s).

In order to obtain a software license for your EK80, you must contact a Simrad dealers or distributor. You can also use the request form on <http://www.simrad.com/support>, or contact our support department directly.

Note

If you have purchased a complete EK80 system from Kongsberg Maritime with transducer(s) and a Processor Unit, the software license has already been installed.

Once you receive your software license string(s), do not loose them.



Details

Available inactive licenses

This list shows all the EK80 software licenses that you have applied, but that you are not using.

To activate one of the licenses, select it, and click the arrow button [**>**].

Currently active licenses

This list shows you the EK80 software licenses that you have currently activated on your Processor Unit.

Copy

Click to copy the currently selected license code.

Delete

Click to delete the currently selected license code.

License Details

This list contains an overview of the functionality available with the currently selected license code.

Type License String

Click to open the **Type License String** dialog box to accept a license code.

You do not need to type the string manually. You can also copy the string using the **Ctrl-C** and **Ctrl-V** keyboard combination, or right-click the mouse to use **Copy** and **Paste** on the short-cut menu.

Related topics

[Installation dialog box, page 382](#)

[Obtaining and installing the software license, page 183](#)

[Moving the software license from one computer to another, page 185](#)

[Main menu, page 316](#)

About dialog box

The **About** dialog box allows you to see the current EK80 software version.



How to open

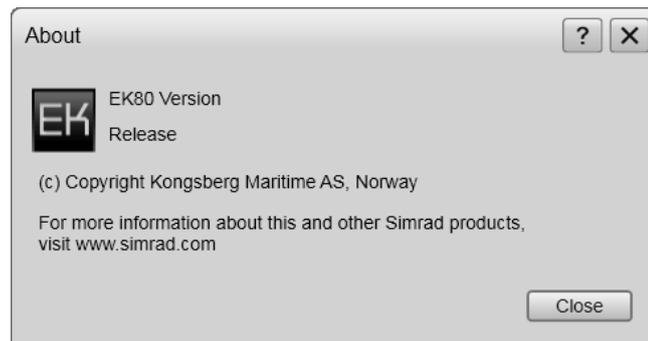
This dialog box is opened from the **Setup** menu.

Description

Every EK80 software release is uniquely identified. The **About** dialog box identifies the current EK80 software version with the release date.

Related topics

[Main menu, page 316](#)



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

Click once on the icon under the **Main** menu to open the **Active** menu.

Click one more time on the icon to close the menu.



Description

- **TVG**

The **TVG** (Time Variable Gain) function allows you to compensate the received data for loss due to geometric spread and absorption.

- **Echogram**

The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG (time varied gain), and how fast the echogram travels horizontally across the display.

- **New Layer**

The **New Layer** dialog box is used to insert a new depth layer.

- **Layer Properties**

The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer.

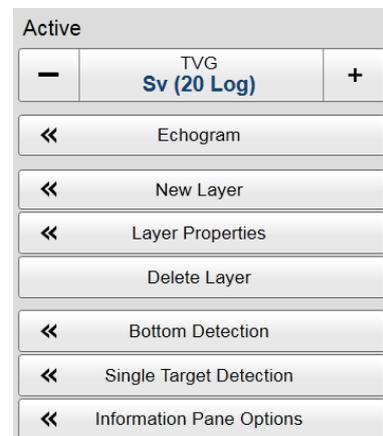
- **Delete Layer**

The **Delete Layer** function allows you to delete the currently selected ("active") depth layer.

- **Bottom Detection**

The purpose of the **Bottom Detection** parameters is 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.

If you have problems with bottom detection, you may consider disabling the function. This can be useful when you only wish to study targets in the water column. Use the dedicated option in the **Bottom Detection** dialog box.



- **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 settings made will not have any effect on the raw data that you save during the survey.

- **Information Pane Options**

The **Information Pane Options** dialog box allows you to change the operational parameters used to present the data in the information panes.

- **Bottom Detection**

The purpose of the **Bottom Detection** parameters is 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.

- **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 settings made will not have any effect on the raw data that you save during the survey.

- **Calculation Interval**

The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.

- **Colour Scale**

The **Colour Scale** dialog box allows you to change the echo level range presented by the current colour scale in the active view.

- **TS Histogram**

The **TS Histogram** options allow you to set up the parameters for the histogram presented in the *TS (Target Strength) Histogram* information pane.

- **Sv(f)**

The **Sv(f)** page controls the scale used in the *Sv(f)* information pane.

- **TS(f)**

The **TS(f)** page controls the scale used in the *TS(f)* information pane.

Context sensitivity

The choices in the **Active** menu depends on which view in the EK80 presentation that is currently "active".

The name of the currently active view is identified at the top of the menu.

To activate a view, click in it. The chosen view will appear with a thicker frame to indicate that it is active. The **Active** menu may therefore change from one view to another.

Topics

[TVG function, page 418](#)

[Echogram dialog box, page 419](#)

[New Layer dialog box, page 428](#)

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Bottom Detection dialog box, page 437](#)

[Single Target Detection dialog box, page 440](#)

[Information Pane Options dialog box, page 443](#)

[Colour Scale dialog box, page 445](#)

[TS Histogram page, page 448](#)

[Sv\(f\) page, page 449](#)

[TS\(f\) page, page 449](#)

TVG function

The **TVG** (Time Variable Gain) function allows you to compensate the received data for loss due to geometric spread and absorption.

How to open

This function is activated on the **Active** menu.

Description

The TVG (Time Variable Gain) functionality compensates for the loss in the acoustic energy due to the geometric spread and the absorption of the sound as it travels through the water.

- 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).
- Depending on the salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the range 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*.

Basically, the TVG function compensation is designed to counteract these natural phenomena, and this is done in the EK80 using digital signal processing. The TVG will thus equalize the echo presentation as a function of range to make targets with the same strength appear with the same intensity independent of their physical distance from the EK80 transducer.

The TVG compensation is expressed as a logarithmic curve. The TVG curve can be selected with several different slopes, each having different gain regulations. The curves are identified as **X log TVG**, where the coefficient **X** is an integer. Typical values for **X** are 10 to 40.

Tip

*The selection made using the **TVG** button is the same as found on the **Echogram** page in the **Echogram** dialog box.*

Details

TVG

Several TVG settings are available.

- **Pr (No TVG)**
TVG compensation is not implemented.
- **Sv (20 log R)**
Volume backscattering strength.
- **Sp (40 log R)**
Point backscattering strength.

To change the setting, move the cursor to either side of the button, and observe that the background colour changes. Click [—] on the left side to decrease the setting value, or click [+] on the right side to increase.

You can also click the middle of the button to open a small menu with the available options.

Apply to all

Click this box if you wish to implement your TVG changes to all the echograms presently in use on the EK80.

Related topics

[Adjusting the TVG \(Time Varied Gain\), page 106](#)

[Active menu, page 318](#)

Echogram dialog box

The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG (time varied gain), and how fast the echogram travels horizontally across the display.



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. The dialog box is provided with three tabs to set up the parameters.

Important

The changes you make here will by default only be applied to the currently selected active echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.

- **Lines**

The **Lines** page in the **Echogram** dialog box allows you to control the horizontal and vertical lines used to enhance the echogram presentation. You can add an extra bottom line, and you can enable either a white line or a hardness indicator line. The page also offers several horizontal information lines, and you can choose the vertical scale of the echogram. Finally, the **Lines** page offers time or distance markers, and you can enable annotations.

- **Echogram**

The **Echogram** page in the **Echogram** dialog box allows you to select which TVG curve to use for the echogram. You can choose from several standard curves. The tab also allows you to choose which type of echogram you wish to display.

- **Horizontal Axis**

The **Horizontal Axis** page in the **Echogram** dialog box allows you to choose the horizontal scale of the echogram. This controls how "fast" the echogram moves from right towards left across the display.

Tip

*Note that you can also select TVG by means of the **TVG** button on the **Active** menu.*

Topics

[Lines page, page 421](#)

[Echogram page, page 424](#)

[Horizontal Axis page, page 427](#)

Lines page

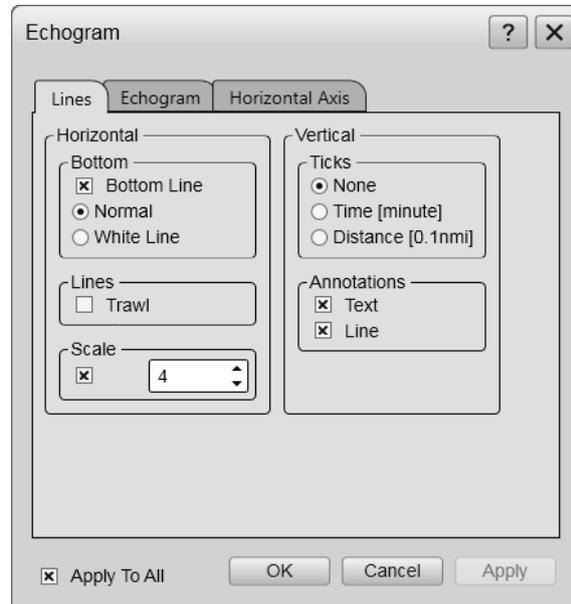
The **Lines** page in the **Echogram** dialog box allows you to control the horizontal and vertical lines used to enhance the echogram presentation.

Description

The parameters on the **Lines** page allows you to add a bottom line, and you can enable a white line to enhance the bottom presentation. The page offers a trawl line, and you can choose the vertical scale of the echogram. The **Lines** page offers time or distance markers, and you can enable annotations.

Important

The changes you make here will by default only be applied to the currently selected active echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.



Details

Horizontal: Bottom

The bottom line can be switched off or on. In addition, you can enable a white line to enhance the presentation.

- **Bottom Line**

The 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.

This is an "on/off" switch. Click to enable.

- **Normal**

The bottom line is presented with its "normal" presentation. The bottom line is drawn in the current foreground colour.

- **White Line**

The 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.

Horizontal: Lines

These options allow you to enable or disable other horizontal lines on the echogram.

- **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. The information from these sensors are drawn as horizontal lines on the EK80 echogram.

Manual trawl parameters can be entered using the **Trawl** page in the **Installation** dialog box.

This is useful for trawl sensor systems not measuring 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.

Horizontal: Scale

When enabled, equidistant horizontal scale lines are drawn inside the echogram in the current foreground colour; black during day and white during night.

No scale lines are drawn when the scale line count is set to 0 (zero).

A maximum of 10 scale lines can be selected.

Vertical: Ticks

When enabled, this function places vertical markers on the echogram.

- **None**
No vertical markers are shown.
- **Time**
This option places a short vertical line in the upper part of the echogram once every specified number of minutes.
- **Distance**
This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of 1/10 nautical miles.

Vertical: Annotations

Select *Text* or *Line* to allow annotations to be displayed in the echogram view. If you select *Line*, the text annotation will be followed by a vertical line for improved visibility.

An annotation can be entered manually using the **Annotation** page in the **Installation** dialog box, or they can be imported from a peripheral device.

Several different annotation types may be added to the echogram. The annotations defined are stored with the raw data as annotation datagrams. They are displayed on the echogram if this feature is enabled in the **Echogram** dialog box.

Note _____

Annotations can only be added to the echogram while in Normal operational mode.

Apply to all

Click this box if you wish to implement your changes to all the echograms presently in use on the EK80.

Related topics

[Adding bottom marker lines to the echograms, page 137](#)

[Adding vertical ticks to the echograms, page 138](#)

[Adding annotations to the echograms, page 139](#)

Echogram page

The **Echogram** page in the **Echogram** dialog box allows you to which type of echogram you wish to display.

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 allows you to select which TVG curve to use for the chosen echogram. You can choose from several standard curves.

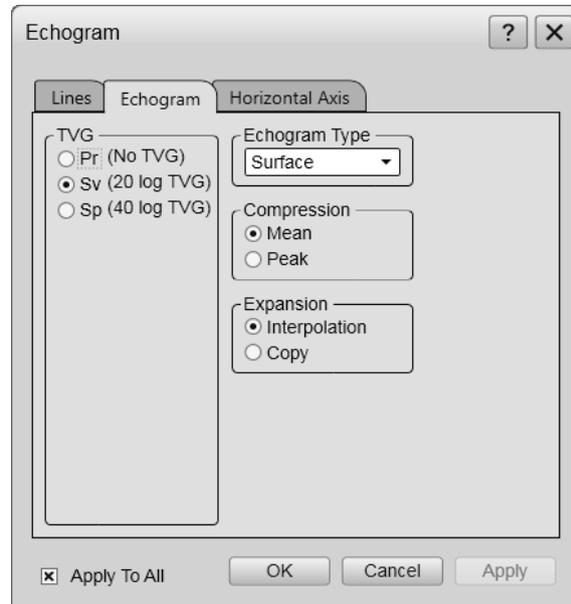
Note that this choice of a TVG curve *is the same* as offered by the **TVG** function. A choice made here will replace any previous choice made by means of the **TVG** function.

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.

Important

The changes you make here will by default only be applied to the currently selected active echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.



Details

TVG

The TVG (Time Variable Gain) functionality compensates for the loss in the acoustic energy due to the geometric spread and the absorption of the sound as it travels through the water.

Several TVG settings are available.

- **Pr (No TVG)**
TVG compensation is not implemented.
- **Sv (20 log R)**
Volume backscattering strength.
- **Sp (40 log R)**
Point backscattering strength.

Echogram Type

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

- **Surface echogram**
The *Surface echogram* shows the echoes starting from the sea surface and down. The sea surface is used as depth reference. 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 on the **Main** menu.

In the surface echogram, all calculations are made from the sea surface and down to the detected bottom. Use this echogram type to obtain correct calculation of the biomass, as well as valid data for the information offered in the *Target Strength Histogram* information pane.
- **Bottom echogram**
The *Bottom echogram* shows the echoes over and below the bottom contour. The bottom is used as depth reference, and is therefore shown as a flat contour. 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 on the **Main** menu.

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

- **Pelagic echogram**

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. 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 on the **Main** menu. The bottom contour shall not be visible in the echogram.

In the pelagic echogram the calculations will disregard any bottom detection. All calculations are thus 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 echogram**

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. This range is set by adjusting the **Start Range** and **Range** settings on the **Main** menu.

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

Compression

These 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

These options describe the situation when the number of samples is lower than the number of pixels, and the sample values are expanded to pixel values.

- **Interpolation:** Pixel values are interpolated between two sample values.
- **Copy:** A sample value is copied into multiple pixel values.

Apply to all

Click this box if you wish to implement your changes to all the echograms presently in use on the EK80.

Related topics

[Selecting which echogram type to use, page 125](#)

[Adjusting the TVG in the Echogram dialog box, page 133](#)

Horizontal Axis page

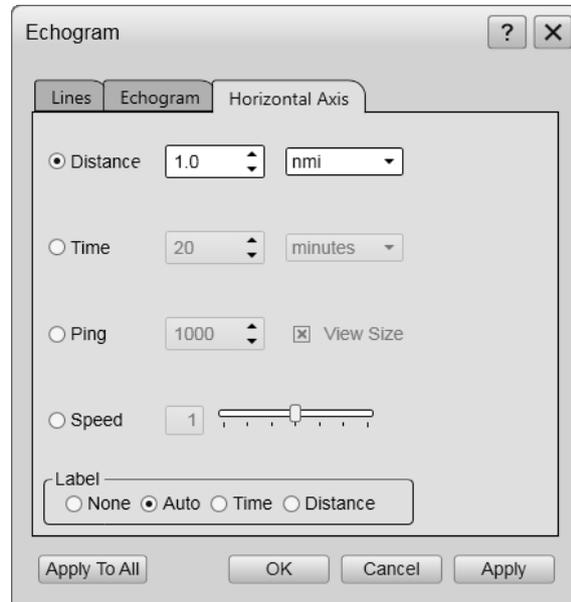
The **Horizontal Axis** tab in the **Echogram** dialog box allows you to choose the horizontal scale of the echogram.

Description

The horizontal scale controls how "fast" the echogram moves from right towards left across the EK80 presentation.

Important

The changes you make here will by default only be applied to the currently selected active echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.



Details

Horizontal Axis

You can set up the horizontal speed of the echogram, that is how fast it travels from left towards right.

- **Distance**

The horizontal scale of the echogram is based on sailed distance. Choose resolution and units with the spin boxes provided.

- **Time**

The horizontal scale of the echogram is based on time. Choose resolution and units with the spin boxes provided.

- **Ping**

The horizontal scale of the echogram is based on the number of pings (transmissions) made. Choose resolution and units with the spin boxes provided. Check the **View Size** box to specify that the number of horizontal pixels shall define the number of displayed horizontal pings (One ping per pixel).

- **Speed**

The horizontal scale of the echogram is based on the relative speed you choose. Choose speed with the ruler provided.

Label

By default, small labels are shown in the bottom left and right corners of the echogram. These labels can contain time or distance to identify the horizontal axis of the echogram. You can also hide them from view.

The following label options are available:

- **None:** Both 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

Click this box if you wish to implement your changes to all the echograms presently in use on the EK80.

Related topics

[Selecting the horizontal scale in the echogram views, page 134](#)

[Adding scale labels to the echogram views, page 136](#)

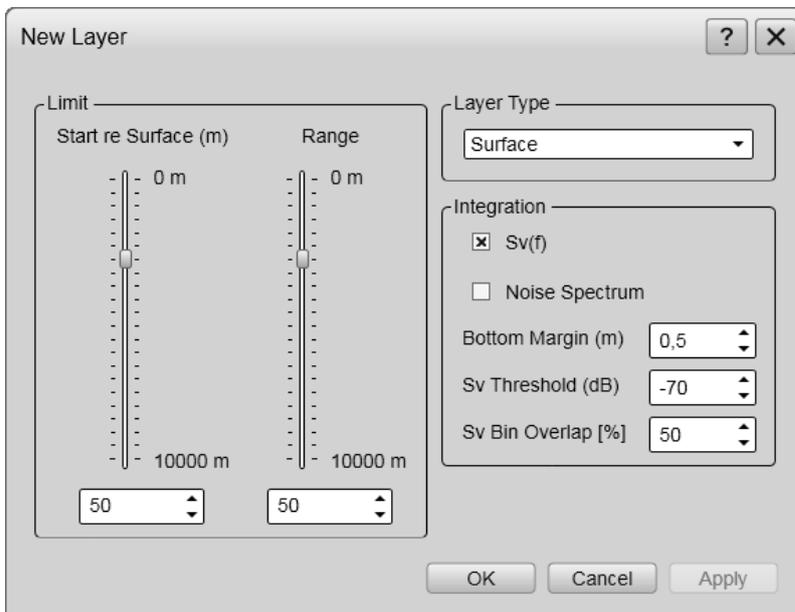
New Layer dialog box

The **New Layer** dialog box is used to 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 echo data collected within a specific depth range in the water column.

By default, a background layer will collect 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 will be 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** on the **Active** menu.

The Numerical information pane is probably the best means of 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.

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.

Sv(f)

The $Sv(f)$ information pane is a plot showing the how echo strength for a group of targets (for example a school of fish) are changing with the operational frequency.

The $Sv(f)$ information pane 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.

This option is by default "on".

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. Naturally, you will then also loose the plot in the information pane.

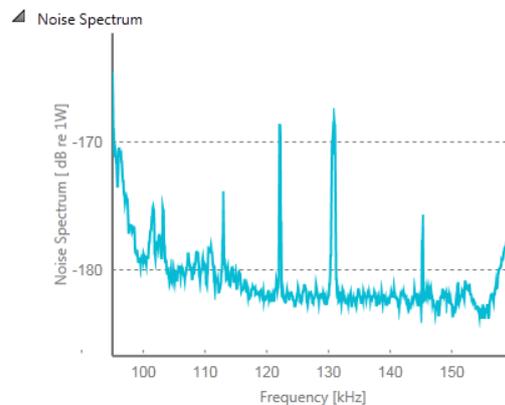
Noise Spectrum

This option is by default "off".

The **Noise Spectrum** option will display 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 numerical data presentation in the *Numerical* information pane.



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.

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 topics

[Layer Properties dialog box, page 432](#)

[Delete Layer function, page 436](#)

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

[Depth layers in the echogram views, page 304](#)

[Measuring the noise in passive mode, page 163](#)

[Selecting *Passive* transceiver mode, page 158](#)

[Sv\(f\) information pane, page 270](#)

[Numerical information pane, page 272](#)

[Active menu, page 318](#)

Layer Properties dialog box

The **Layer Properties** dialog box is used to change the current properties of the chosen ("active") depth layer.

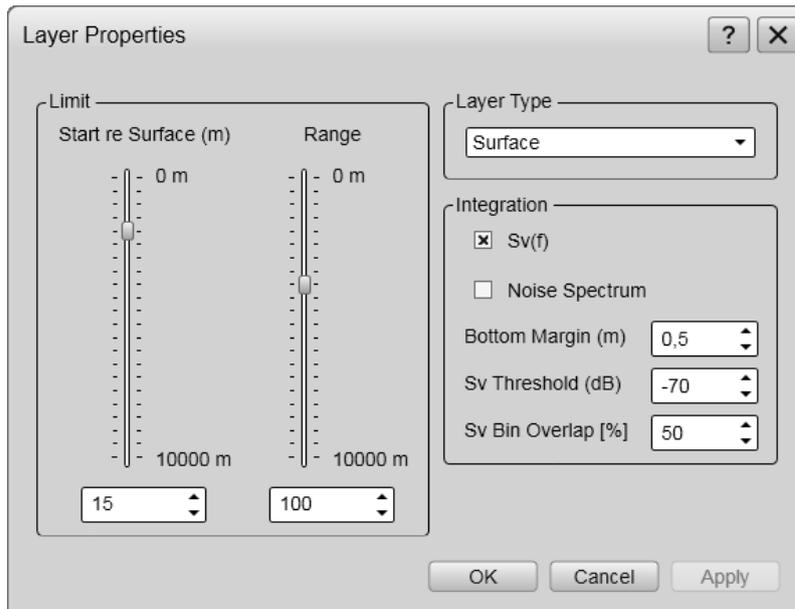


Prerequisites

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 echo data collected within a specific depth range in the water column.

By default, a background layer will collect 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 will be 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** on the **Active** menu.

The Numerical information pane is probably the best means of 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.

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.

Sv(f)

The $Sv(f)$ information pane is a plot showing the how echo strength for a group of targets (for example a school of fish) are changing with the operational frequency.

The $Sv(f)$ information pane 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.

This option is by default "on".

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. Naturally, you will then also loose the plot in the information pane.

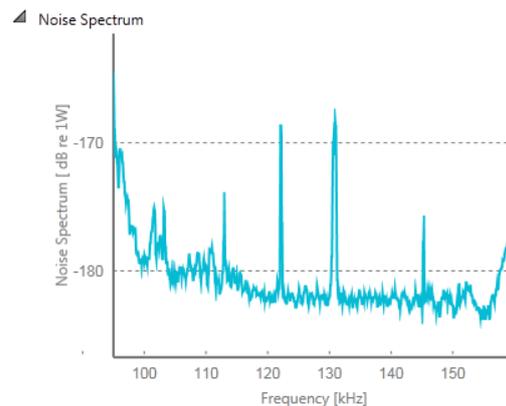
Noise Spectrum

This option is by default "off".

The **Noise Spectrum** option will display 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 numerical data presentation in the *Numerical* information pane.



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.

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 topics

[Delete Layer function, page 436](#)

[New Layer dialog box, page 428](#)

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

[Depth layers in the echogram views, page 304](#)

[Measuring the noise in passive mode, page 163](#)

[Selecting *Passive* transceiver mode, page 158](#)

[Sv\(f\) information pane, page 270](#)

[Numerical information pane, page 272](#)

[Active menu, page 318](#)

Delete Layer function

The **Delete Layer** function allows you to delete the currently selected ("active") depth layer.



Prerequisites

To use the **Delete Layer** function, you must first select a layer in the *Numerical* information pane.

How to open

This function is activated on 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.*

Related topics

[Layer Properties dialog box, page 432](#)

[New Layer dialog box, page 428](#)

[Creating a new depth layer, page 142](#)

[Modifying an existing depth layer, page 144](#)

[Deleting a depth layer, page 145](#)

[Monitoring the numerical information in the depth layers, page 146](#)

[Depth layers in the echogram views, page 304](#)

[Numerical information pane, page 272](#)

[Active menu, page 318](#)

Bottom Detection dialog box

The purpose of the **Bottom Detection** parameters is 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

The **Bottom Detection** parameters can be accessed from two places in the EK80 user interface.

- The **Bottom Detection** page can be opened from the **Information Pane Options** dialog box. To open this dialog box, click the **Information Pane Options** button on the **Active** menu, or the **Setup** button in an information pane. 
- The **Bottom Detection** dialog box can be opened from the **Bottom Detection** button on the **Active** menu

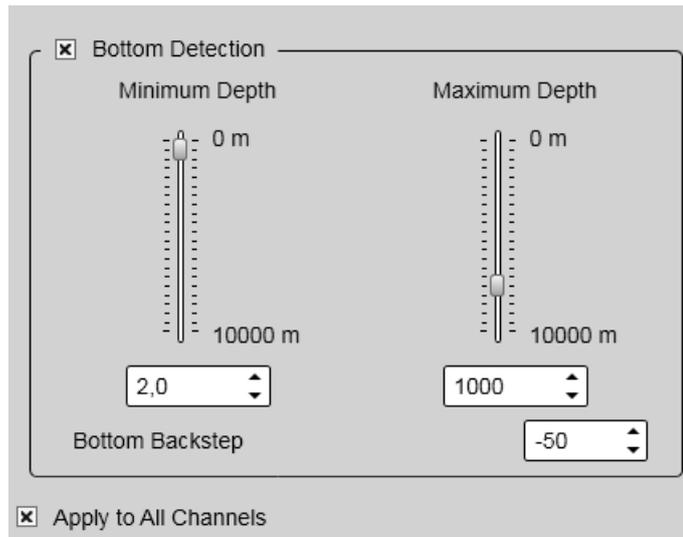
The parameters are the same, it does not matter from where you open the page or the dialog box.

Description

Occasionally, difficult environmental, water or bottom conditions may inhibit bottom lock. 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 "bottom lock" on the depth when the EK80 is pinging. The EK80 needs this lock to locate the correct depth, and to stay on it during the operation, even though the depth changes continuously.

The **Bottom Backstep** parameter allows you to manually modify where on the bottom echo the depth shall be detected.



Tip

*If you have problems with bottom detection, you may consider disabling the function. This can be useful when you only wish to study targets in the water column. Use the dedicated option in the **Bottom Detection** dialog box.*

Details

Bottom Detection

This function allows you to switch bottom detection on and off. Click to activate it.

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.

You can enter the desired **Minimum Depth** value by dragging the slider up or down, or by means of the spin box.

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 in order to avoid annoyingly long ping intervals every time bottom track is lost. A depth value of either 0 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 then not be able to detect the bottom at all, and the displayed depth will be 0.00 m

You can enter the desired **Maximum Depth** value by dragging the slider up or down, or by means of the spin box.

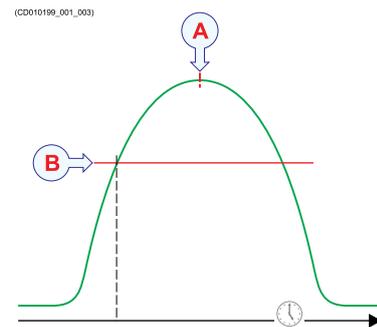
Bottom Backstep

The **Bottom Backstep** 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 EK80's 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 **Apply to All Channels** to use the selected setting(s) on all the channels presently in use on the EK80.

Related topics

[Information Pane Options dialog box, page 443](#)

[Depth information pane, page 261](#)

[Active menu, page 318](#)

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 settings made will not have any effect on the raw data that 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.

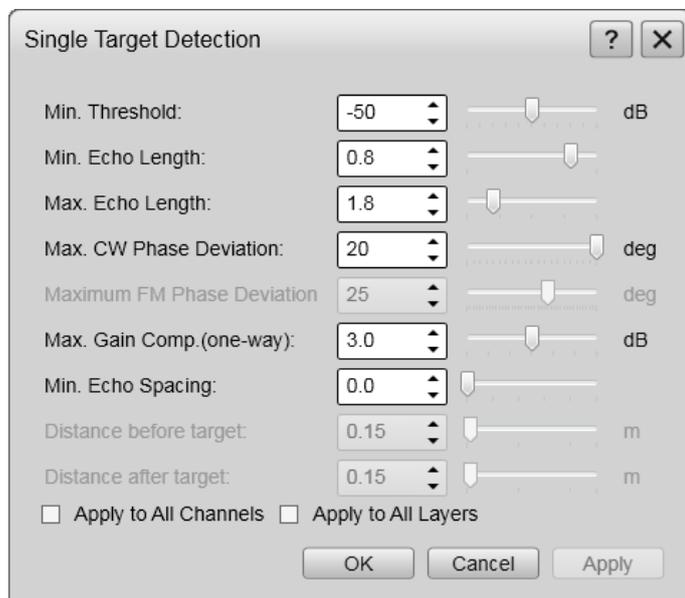
- The **Single Target Detection** dialog box can be opened (as a page) from the **Information Pane Options** dialog box. To open this dialog box, click the **Setup** button in an information pane, or the menu button on the **Active** menu.
- The **Single Target Detection** dialog box can be opened from 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 provided for the real-time presentation of the data.*



Details

Min. Threshold

This setting applies to both CW and FM operation.

Some echoes will be 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 for both CW and FM operation.

The target strength for a single target must exceed this threshold (in dB) to be accepted.

Tip _____

Use this function to define a "filter" value.

Min. Echo Length / Max. 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 these settings, 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 the 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 the maximum echo length to 1.8, all echoes longer than 1.8 times the length of the transmitted pulse will be deleted.

Max. 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.

Max. 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 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.

Max. 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.

Min. 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 **Apply to All Channels** to use the selected setting(s) on all the channels presently in use on the EK80.

Apply to All Layers

Select **Apply to All Layers** to use the selected setting(s) on all the depth layers presently in use on the EK80.

Related topics

[Information Pane Options dialog box, page 443](#)

[Target Strength Histogram information pane, page 263](#)

[Target Position information pane, page 265](#)

[Active menu, page 318](#)

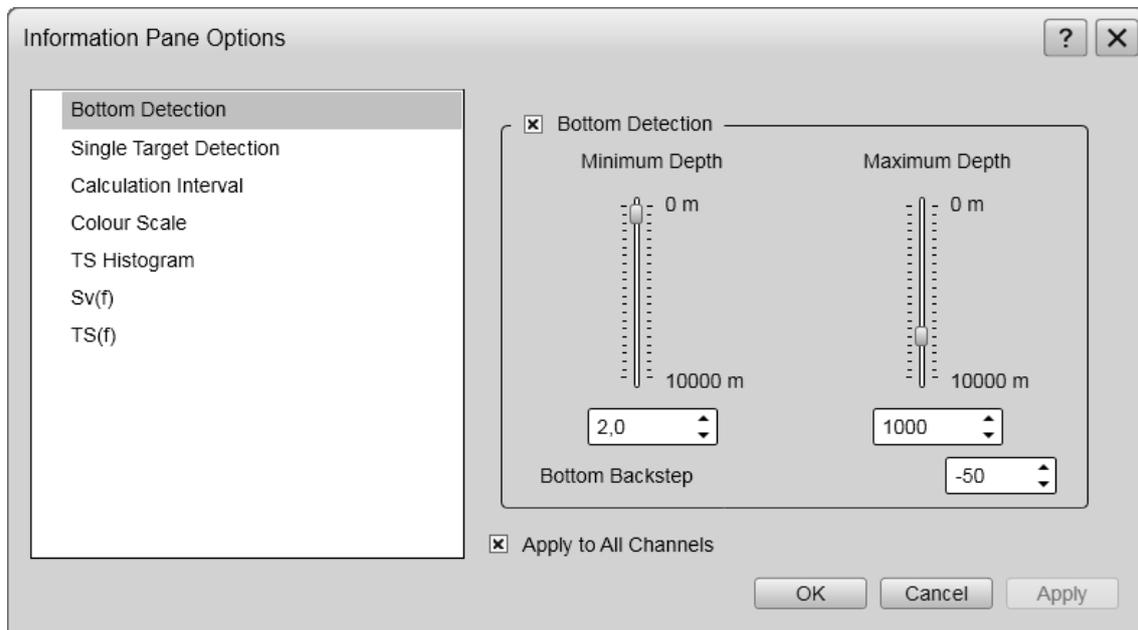
Information Pane Options dialog box

The **Information Pane Options** dialog box allows you to change the operational parameters used to present the data in the information panes.



How to open

This dialog box is opened from the **Active** menu.



Description

The **Information Pane Options** dialog box offers a menu on the left side, and several pages for operational parameters on the right side.

- **Bottom Detection**

The purpose of the **Bottom Detection** parameters is 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.

- **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 settings made will not have any effect on the raw data that you save during the survey.

- **Calculation Interval**

The **Calculation Interval** options allow you to define the time, number of pings, or sailed distance used to calculate the biomass and the size distribution.

- **Colour Scale**

The **Colour Scale** dialog box allows you to change the echo level range presented by the current colour scale in the active view.

- **TS Histogram**

The **TS Histogram** options allow you to set up the parameters for the histogram presented in the *TS (Target Strength) Histogram* information pane.

- **Sv(f)**

The **Sv(f)** page controls the scale used in the *Sv(f)* information pane.

- **TS(f)**

The **TS(f)** page controls the scale used in the *TS(f)* information pane.

Related topics

- [Bottom Detection dialog box, page 437](#)
- [Single Target Detection dialog box, page 440](#)
- [Calculation Interval dialog box, page 381](#)
- [Colour Scale dialog box, page 445](#)
- [TS Histogram page, page 448](#)
- [Sv\(f\) page, page 449](#)
- [TS\(f\) page, page 449](#)
- [Colour Scale information pane, page 260](#)
- [Depth information pane, page 261](#)
- [Target Strength Histogram information pane, page 263](#)
- [Target Position information pane, page 265](#)
- [TS\(f\) information pane, page 266](#)
- [Biomass information pane, page 268](#)
- [Sv\(f\) information pane, page 270](#)
- [Active menu, page 318](#)

Colour Scale dialog box

The **Colour Scale** dialog box allows you to change the echo level range presented by the current colour scale in the active view.

How to open

To open the **Information Pane Options** dialog box with the **Colour Scale** page, click the **Setup** button in the *Colour Scale* information pane. The information pane is in turn opened from the button on the top bar.



You can also open the **Information Pane Options** dialog box from the **Active** menu.

Description

The colour scales used by the EK80 are designed to reflect the echo strength.

When the page opens, it will reflect all the TVG settings in the active echograms. The minimum levels chosen in the page is also reflected on the relevant **Gain** buttons on the **Main** menu.



12 colours

Sonar colours

Echogram colours

Grayscale

BI500 colours



The **Echogram colours** scale is based on the standard 12-colour scale, but additional colours have been added between these to make smoother colour transitions.

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.

However, as the number of colours can differ, and dedicated colour schemes can be used, this is not necessarily correct. A high numeric TVG value displays weak echo signals properly while the stronger signals saturate into the darker colours. A low numeric value displays strong echo signals properly. Weak signals below the lower limit of the colour scale are not displayed (the display background colour is used).

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 down 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.

Important

It is important to understand that any changes made to the colour scales have no effect on the gain. The parameters only controls the visual presentation of the EK80 echograms.

Details

Min (Minimum) Level

Set the lower limit of the echo strength you wish the relevant colour scale to reflect.

Max (Maximum) Level

Set the upper limit of the echo strength you wish the relevant colour scale to reflect.

Common Colour Span

Set the upper limit of the echo strength you wish the colour scale to reflect.

Apply to All Channels

Select **Apply to All Channels** to use the selected setting(s) on all the channels presently in use on the EK80.

Related topics

[Information Pane Options dialog box, page 443](#)

[Colour Scale information pane, page 260](#)

[Active menu, page 318](#)

TS Histogram page

The **TS Histogram** options allow you to set up the parameters for the histogram presented in the *TS (Target Strength) Histogram* information pane.

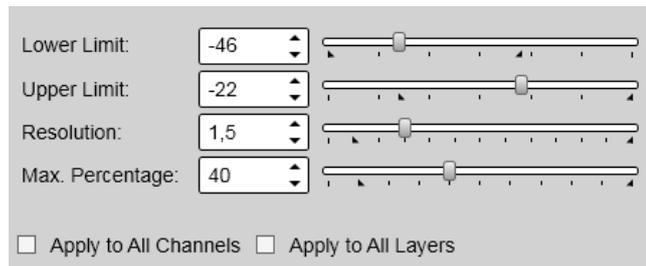
How to open

This page is located in the **Information Pane Options** dialog box. To open, click **Information Pane Options** on the **Active** menu.



Description

The **TS Histogram** options allow you to shape the histogram in the *TS Histogram* information pane to your own requirements. You can set the upper and lower limits, the accuracy, and the vertical resolution.



Details

Lower limit

This function specifies the lower limit of the histogram in the information pane.

The value selected reflects the target strength in dB.

Upper limit

This function specifies the upper limit of the histogram in the information pane.

The value selected reflects the target strength in dB.

Resolution

This function specifies accuracy of the histogram; that is how many vertical bars that are used in the *Size Distribution* information pane.

This function specifies accuracy of the histogram; that is how many vertical bars that are used.

Max(imum) percentage

This function controls the vertical resolution of the histogram.

Apply to All Channels

Select **Apply to All Channels** to use the selected setting(s) on all the channels presently in use on the EK80.

Apply to All Layers

Select **Apply to All Layers** to use the selected setting(s) on all the depth layers presently in use on the EK80.

Related topics

- [Information Pane Options dialog box, page 443](#)
- [Target Strength Histogram information pane, page 263](#)
- [Active menu, page 318](#)

Sv(f) page

The Sv(f) page controls the scale used in the Sv(f) information pane.

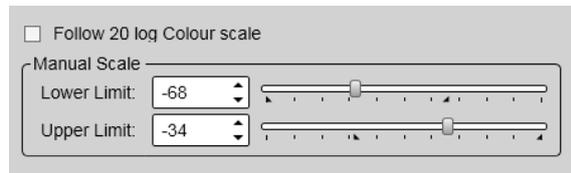
How to open

This page is located in the **Information Pane Options** dialog box. To open, click **Information Pane Options** on the **Active** menu.



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 Sv(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.

Related topics

- [Information Pane Options dialog box, page 443](#)
- [Sv\(f\) information pane, page 270](#)
- [Active menu, page 318](#)

TS(f) page

The TS(f) page controls the scale used in the TS(f) information pane.

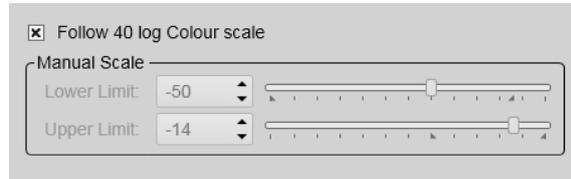
How to open

This page is located in the **Information Pane Options** dialog box. To open, click **Information Pane Options** on the **Active** menu.



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 40 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.

Related topics

[Information Pane Options dialog box, page 443](#)

[TS\(f\) information pane, page 266](#)

[Active menu, page 318](#)

Secondary functions and dialogs boxes

Topics

- [Replay File dialog box, page 451](#)
- [LAN Port Setup dialog box, page 453](#)
- [Serial Port Setup dialog box, page 454](#)
- [Port Monitor dialog box, page 456](#)
- [Add Serial Port dialog box, page 458](#)
- [Select Inputs dialog box, page 458](#)
- [Messages dialog box, page 460](#)

Replay File dialog box

The **Replay File** dialog box allows you to choose which file(s) to be used for playback. The files listed in the dialog box have been generated automatically during recording. Each file is identified with the time and date it was made.

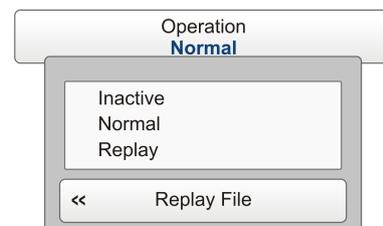


How to open

To open the **Replay File** dialog box, click **Operation** on the **Operation** menu.

Tip _____

*Once the playback has started, you can also open the **Replay File** dialog box from the replay bar.*



Description

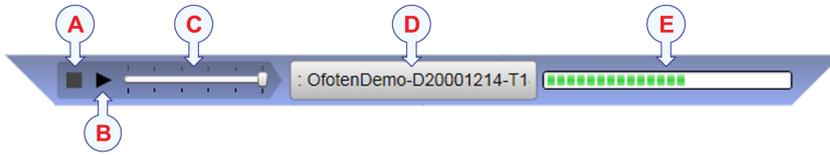
The EK80 is provided with a few example files for playback. You can also create files by means of the recording function of the EK80.

In order to play back these files, you must first choose playback mode on the **Operation** menu, and then click the **Replay File** button to open the **Replay File** dialog box.

The dialog box allows you to add one or more files to a the list of active files for playback. You can click **Loop** to have a 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.

Once you selected a replay file, and started the presentation, you will use the replay bar to control it.



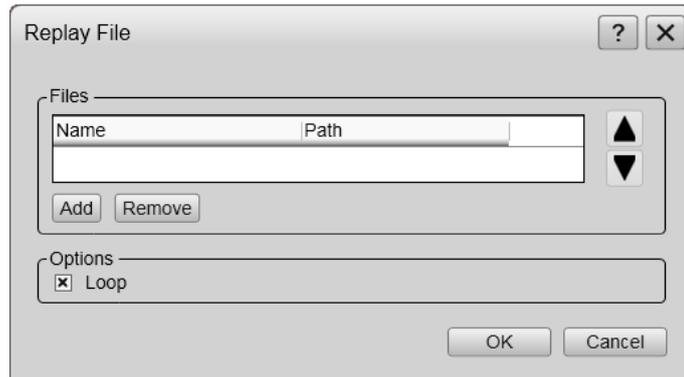
Details

Files

This list displays the currently files available for playback.

Add

Click this button to add additional file(s) to the playback **Files** list. A standard operating system dialog box opens to choose files.



Remove

Click on a file in the playback list, then click this button to remove the file from the list. The file is removed from the list, but not from the hard disk.

Tip

If you wish to remove a playback file from your hard disk, you need to use an operating system file program.

Loop

Check this box if you want the EK80 playback function to loop through all the currently selected replay files without stopping.

Related topics

[Operation function, page 333](#)

[Selecting *Replay* operational mode, page 114](#)

[Choosing which echogram RAW data file\(s\) to replay, page 223](#)

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 sensors (speed, position etc) or peripheral systems.

How to open

To open the **LAN Port Setup** dialog box, click once on one of the LAN ports listed in the **I/O Setup** area of the **Outputs** and **Installation** dialog boxes. Then, click the **Setup** button under the list.

The **Outputs** dialog box can be opened from the **Operation** menu.



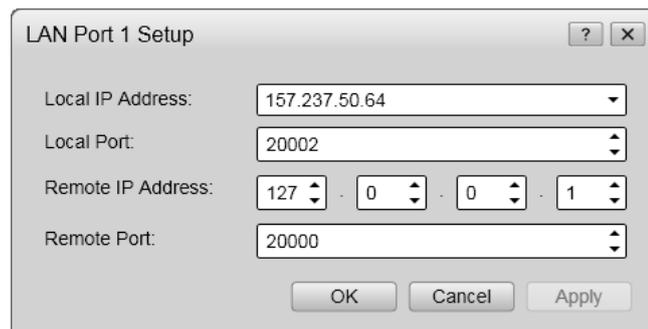
The **Installation** dialog box opens from the **Setup** menu.



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.



Details

Local IP Address

This is the Internet Protocol (IP) address of the local Ethernet interface adapter. This is the adapter in your EK80 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 interface adapter, you are provided with a list of the available addresses.

Local Port

This port is important if you wish to receive information on the Processor Unit. The number you define here must match the port number on the remote computer.

To find the port number on the remote computer, consult the documentation for the software program to be used.

If the data communication is set up to only export information from the EK80 Processor Unit to a peripheral system, this **Local Port** parameter is not required.

Remote IP Address

This is the Internet Protocol (IP) address for the remote computer.

If the data communication between your EK80 Processor Unit and the remote computer is set up to only receive data on the Processor Unit, this parameter is not required.

If you wish to set up an output for broadcast from the Processor Unit to network computers, define IP address 255.255.255.255. This is the default setting.

If you use point-to-point communication in a closed network, you need to enter the remote IP address manually.

Remote Port

This port is important if you wish to transmit information from the Processor Unit to another computer on the network. The application on the remote computer will "listen" to this port number.

Related topics

[I/O Setup page, page 349](#)

Serial Port Setup dialog box

The **Serial Port Setup** dialog box allows you to define the parameters for serial line communication with external sensors (speed, position etc) or peripheral systems. Typical serial lines formats are RS-232 and RS-422.

How to open

To open the **Serial Port Setup** dialog box, click once on one of the serial ports listed in the **I/O Setup** area of the **Outputs** and **Installation** dialog boxes. Then, click the **Setup** button under the list.

The **Outputs** dialog box can be opened from the **Operation** menu.



The **Installation** dialog box opens from the **Setup** menu.



Description

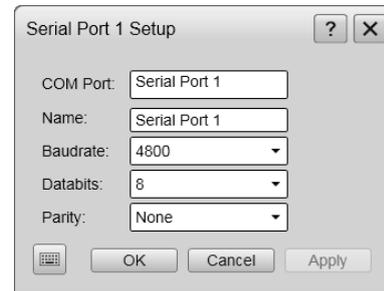
Serial ports are still a very common method for interface between maritime systems.

It is very important that any serial line between the EK80 and any external system is setup up correctly with identical parameters at each end.

The NMEA (*National Marine Electronics Association*) standard for serial communication defines standard parameters for such interfaces.

For more information, see:

- <http://www.nmea.org>



Details

COM Port

This text fields identifies the current communication port on the computer. You can not change this information.

Name

This is a text field. Use it to provide a suitable name for the communication port.

Tip _____
*If you do not have a computer keyboard connected to your EK80 system, click the **Keyboard** button to open an on-screen keyboard.*

Baud rate

Use this entry to specify the baudrate ("speed") for the serial communication.

Tip _____
Standard baudrate defined for NMEA serial line communication is 4800 baud.

Data bits

Use this entry to specify the number of data bits for the serial communication.

Tip _____
The standard number of data bits defined for NMEA serial line communication is 8 (eight).

Parity

Use this entry to specify the parity for the serial communication.

Tip

Standard parity defined for NMEA serial line communication is "None".

Related topics

[I/O Setup page, page 349](#)

Port Monitor dialog box

The **Port Monitor** dialog box allows you to study the communication stream on the chosen serial line or Ethernet port.

How to open

To open the **Port Monitor** dialog box, click once on one of the serial or LAN ports listed on the **I/O Setup** page of the **Outputs** and **Installation** dialog boxes. Then, click the **Monitor** button under the relevant list.

The **Outputs** dialog box can be opened from the **Operation** menu.



The **Installation** dialog box opens from the **Setup** menu.

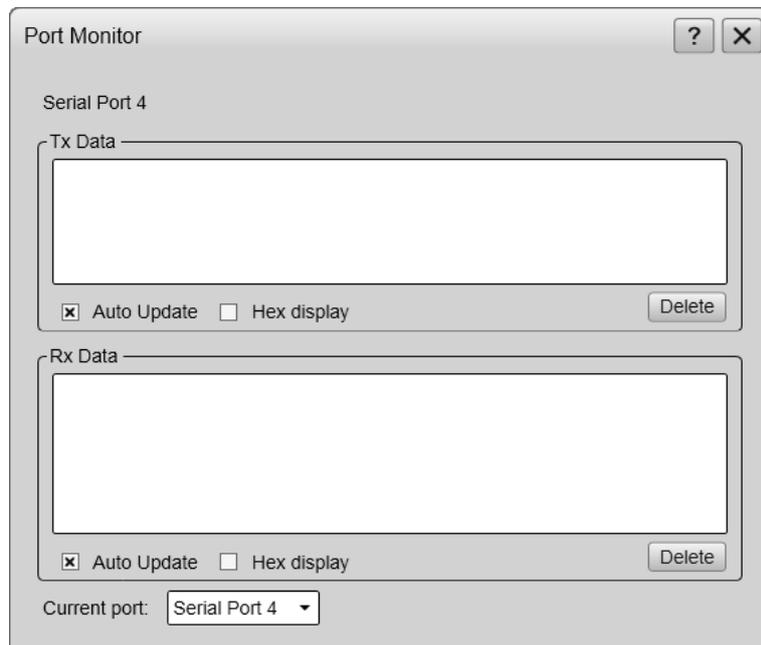


Description

The **Port Monitor** dialog box provides one text field for incoming messages (**Rx Data**), and one for outgoing (**Tx Data**). Use these fields and your own knowledge of the data communication to investigate the telegrams.

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 window displays the data communication transmitted out from the EK80 to external devices.

Rx Data

This text window is used to display the data communication received by the EK80 from external sensors (position, speed etc) or peripheral systems.

Auto update

When this box is selected, the relevant field is continuously updated with new information. If you wish to freeze the information for further investigation, deselect to disable the automatic update.

Hex display

When this box is selected, the information in the relevant text field is shown in hexadecimal format.

Delete

This button clears the text field to allow a new stream of communication data to start on a blank page.

Current port

This field identifies the port you are monitoring.

Related topics

[I/O Setup page, page 349](#)

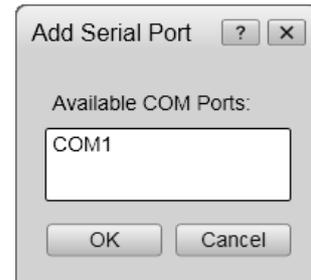
Add Serial Port dialog box

The **Add Serial Port** dialog box allows you to put a free serial port (COM port) on the EK80 computer to use for interface purposes.

How to open

To open the **Add Serial Port** dialog box, click the **Add** button under the list of serial ports in the **I/O Setup** area in the **Outputs** and **Installation** dialog boxes.

The **Outputs** dialog box can be opened from the **Operation** menu.



The **Installation** dialog box opens from the **Setup** menu.



Description

The ports available on the computer are listed automatically. To select a port, click once on its name, and then click **OK**.

When a serial port has been added, it is automatically listed among the other serial ports on the **I/O Setup** page.

Tip

*You can give your new serial port a better name in the **Serial Port Setup** dialog box.*

Related topics

[I/O Setup page, page 349](#)

Select Inputs dialog box

The **Select Inputs** dialog box allows you to select information from external sensors (position, speed etc) or peripheral systems, and connect these to the chosen Ethernet (LAN) or serial line input.

How to open

To open the **Select Inputs** dialog box, click once on one of the Ethernet (LAN) or serial ports listed in the **I/O Setup** area of the **Outputs** and **Installation** dialog boxes. Then, click the **Input** button under the list.

The **Outputs** dialog box can be opened from the **Operation** menu.



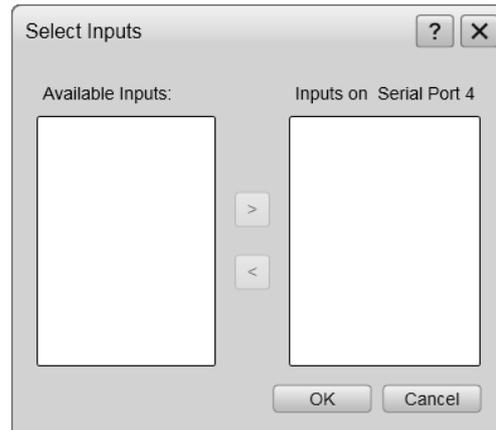
The **Installation** dialog box opens from the **Setup** menu.



Description

In the **Select Inputs** dialog box, all available input sources are listed in the left text field.

- To add an input, click on it in the left column to select it, and then click the [**>**] button.
- To remove an input, click on it in the right column to select it, and then click the [**<**] button.



Important

Note that this dialog box allows you to add more than one input signal to a serial port. You must be familiar with the type of input signals before you do this. If an input port is set up to receive NMEA serial messages, the same input port can not be used to simultaneously receive ASCII messages.

Details

Available Inputs

This field lists the available input signals.

The available sources are defined in a configuration file on the EK80, and reflects the input sources and file formats the EK80 supports.

Inputs

This field lists the selected input signals you have chosen to connect to the relevant communication port.

Related topics

[I/O Setup page, page 349](#)

[NMEA datagram formats, page 527](#)

[Proprietary datagram formats, page 534](#)

[Third party datagram formats, page 541](#)

Messages dialog box

The **Messages** dialog box allows you to read and acknowledge messages from the EK80.

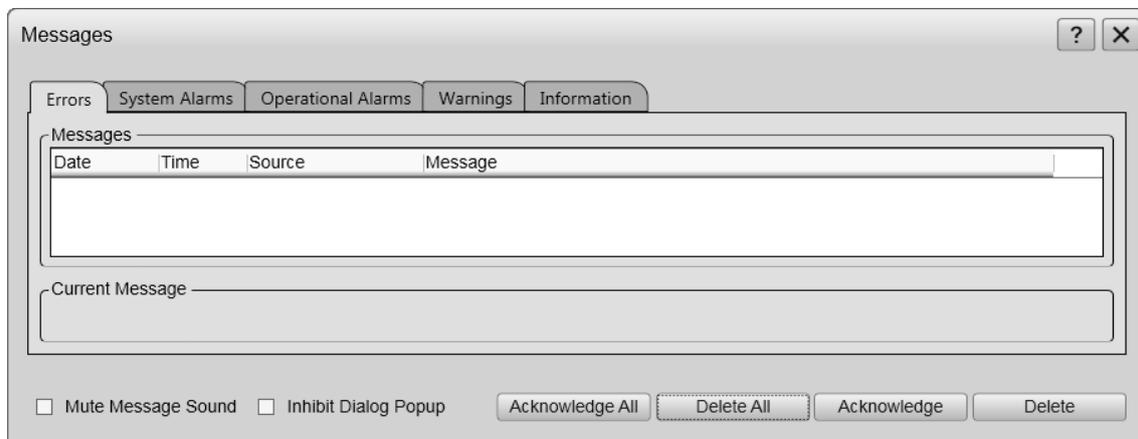
How to open

To open the **Messages** dialog box, click the **Messages** button on the top bar.



When a new message is issued by the EK80, the **Messages** icon on the top bar will flash. If you hold the cursor over the icon, a short list of current message status shown.

The **Messages** dialog box can also be opened from the **Test And Report** dialog box on the **Setup** menu.



Description

Messages from the EK80 can be related to any type of hardware or software errors, as well as events related to operational conditions.

A new message is flagged by means of the **Message** icon on the top bar. Click the icon to open the **Messages** dialog box.

The same icon and dialog box is used with other message types presented by the EK80. 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 click on the message text to copy it to the larger text field under the table.

The following message types are used:

- **Errors**

These are fatal errors. Operation of the EK80 can not continue. You need to power down the system, and attempt a restart.

- **System alarms**

These are messages related to the EK80 system, or to major software components. You can continue the operation, but note that the data provided by the EK80 may be inaccurate. A system 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 message is issued when an irregular event occurs. Depending of the message nature, check what is causing the message. A system restart is not required.

- **Information**

An information messages is simply a notification of a minor operational event. No actions are required.

Details

Tabs

There are several tabs on the **Messages** dialog box, one for each message category. Click on the tab to see the list of messages in the applicable category.

Messages

The messages are listed in a table providing the date and time of issue, the source of the information (for example a software function), and the actual message.

Current Message

The text in a message may be longer than the message listing may show. To read the complete message, click on it. The text will be copied into the **Current Message** field.

Mute message sound

Provided that your EK80 system is equipped with a loudspeaker, messages can be notified using an audible sound. Use this option to disable the audible signal.

Inhibit Dialog Popup

Click to prevent the **Messages** dialog box from opening automatically.

When this option is used, you must keep an eye on the **Message** icon on the top bar, as new messages will only be flagged by this icon.

Acknowledge All

Click to acknowledge all new messages in the current list.

Delete all

Click to delete all new messages in the current list.

Acknowledge

Click to acknowledge the currently selected message.

Delete

Click to delete the currently selected message.

Concept descriptions

Topics

[Ramping concept description, page 464](#)

[Sound speed algorithms, page 465](#)

[Absorption algorithm, page 466](#)

[Observation range versus operational frequency, page 467](#)

[Bottom echo concept description, page 468](#)

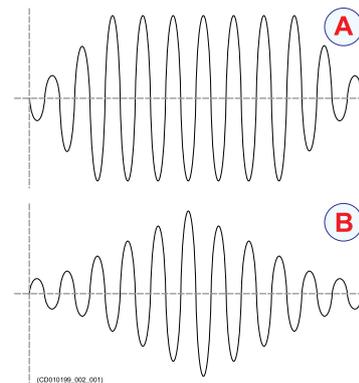
[Wave propagation concept description, page 468](#)

[Acoustic noise, page 470](#)

Ramping concept description

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 only two cycles. At the end of the pulse, another two cycles are used to reduce the output level. 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 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.

The advantage with *Fast* ramping is that the transmitted pulse contains more energy. 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 in the outer edges of the frequency band.

- *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 based on the principles we use when filtering the echoes with a frequency matched filter. This filtering will produce sidelobes, and these will be lower with *Slow* ramping than with *Fast* ramping. Smaller side lobes will reduce "crosstalk"; a strong echo from one range will not contaminate other ranges.

A raised cosine window is used as ramping function.

Ramping when using FM transmission

- *Fast* ramping will result in a longer effective pulse duration 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 which 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 a longer effective pulse duration than *Slow* ramping. *Fast* ramping is normally used to increase signal-to-noise ratio.
- *Slow* ramping increases and decreases the transmit signal amplitude slowly which is more "gentle" to the transducer and can sometimes 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 335](#)

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

[Environment dialog box, page 377](#)

[Absorption algorithm, page 466](#)

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

[Environment dialog box, page 377](#)

[Sound speed algorithms, page 465](#)

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 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 frequency.

Bottom detection can be expected to work down to 3000 meters when using the *Simrad 38-7* transducer (37 kHz, 7x7 degrees, 2000 W). However, bottom detection becomes unreliable below 450 meters if you use the *Simrad 50/200D* transducer (200 kHz, 7x7 degrees, 1000 W)

Typical observation ranges are shown in the table.

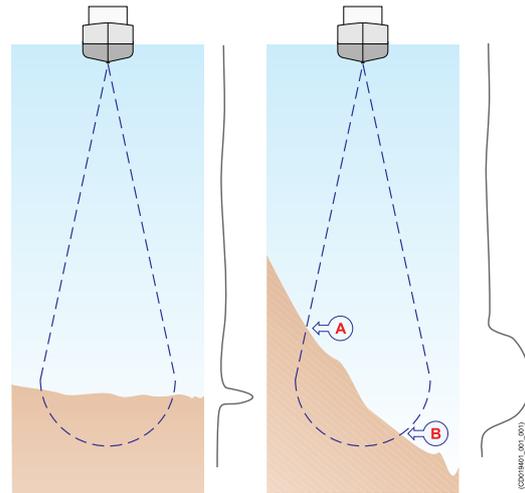
Transducer	Frequency (kHz)	Pulse duration (ms)	Beam angle (deg)	Bandwidth (Hz)	Tx power (W)	Range (m)
38-7	38	4	7	766	2000	3000
38-9	38	4	9	766	1500	2600
38/200D	38	4	13x21	766	1000	2100
50/200D	50	2	10x16	1493	1000	1400
50-18	50	2	18	1526	500	1400
50-7	50	2	7	1493	2000	1900
120-15	120	1	10	3026	1000	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
<i>Maximum detection depth</i>						

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.

Bottom echo concept description

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.

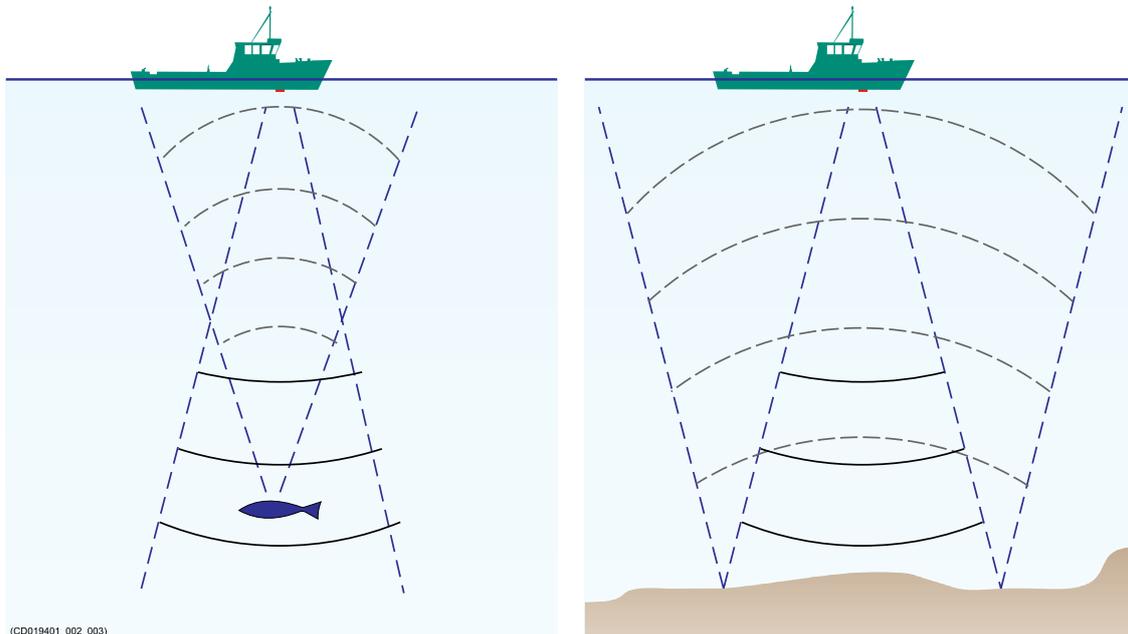
The EK80 algorithm is designed to handle a number of difficult situations. The algorithm maintains bottom lock for a discontinuous jump in bottom depth. It avoids false bottom detections on for example a dense school of fish. The algorithm chooses the upper boundary of the first layer when the bottom 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.

Wave propagation concept description

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.

A good average value to be used in the **Environment** dialog box is 1500 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.

At the bottom there are many small targets. All targets within the beam angle will be reflected. The area which is covered by the beam will increase with the *square-law* or $20 \log TVG$ (Time Varying Gain) spreading. Bottom of the same type (same backscatter) will be displayed with the same colour independent of the depth.

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. In underwater acoustics the reference value is that of a plane wave of rms pressure 1 uPa measured at a distance of 1 m.

Acoustic noise

As with any other hydroacoustic systems, the quality of the EK80 presentations are subject to unwanted acoustic noise. The echoes from any large and small target must be detected inside the noise.

Topics

[Contributing factors, page 470](#)

[Self noise, page 472](#)

[Ambient noise, page 474](#)

[Fishing gear noise, page 474](#)

[Electrical noise, page 475](#)

[Some means to reduce acoustic noise, page 475](#)

Contributing factors

Several factors are contributing to the performance of the hydroacoustic equipment used on board a vessel.

Such factors include:

- 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.

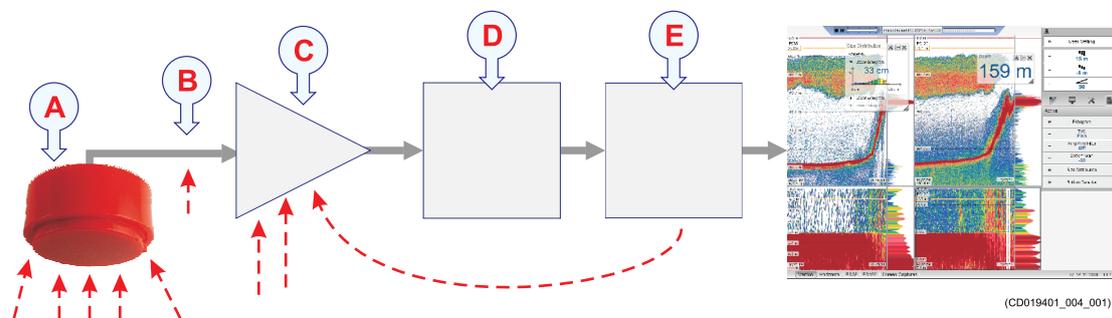
The *signal-to-noise ratio*, however, can be improved by making the correct choices during installation.

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 [...].

http://en.wikipedia.org/wiki/Signal_to_noise_ratio (September 2013)

For active sonar and echo sounder systems, 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 long range and dependable interpretation. The noise that contributes to the signal to noise ratio on hydroacoustic instruments may be divided into the following types of noise:

- Self noise
- Ambient noise
- Fishing gear noise
- Electrical noise
- Reverberation



- 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 etc.
- C** The preamplifiers are very sensitive, and they can easily pick up electrical noise from internal and external power supplies. They are also vulnerable for analogue noise created by their own circuitry. Digital noise created by the converter and processing circuitry can also create problems.
- D** A/D converters transform the analogue echoes to digital format.
- E** Signal processing circuitry can create digital noise.

Self noise

Any vessel equipped with a hydroacoustic system will produce more or less self noise.

There are many sources of such self noise.

- **Machinery noise:** Main engine, auxiliary engines, gears, pumps, blowers, refrigerator systems, etc.
- **Electric noise:** Electric motors, ground loops, etc
- **Propeller noise:** Propeller blade properties, cavitation, shaft vibrations, static discharges
- **Cavitation**
- **Flow noise:** Laminar flow, turbulent flow, bubbles, etc
- **Rattle noise:** Loose parts
- **Interferences:** Other hydroacoustic systems on your own vessel

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 is usually the main engine on board the vessel. The contribution from auxiliary machinery may, however, be considerable, especially if some of it is in poor shape. The machinery noise can be transmitted to the transducer as a:

- Structure-borne noise through the ship structure and the transducer mountings
- Water-borne noise through the hull into the water to the transducer

Electric 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 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 maintained.

Propeller noise

This source 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.

This 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 usually occurs more willingly in air filled water and the occurrence is dependent on the hydrostatic pressure. Cavitation is a severe source of noise. The noise is made when the voids implode. Cavitation noise often occurs at the propeller and near extruding objects at higher speeds.



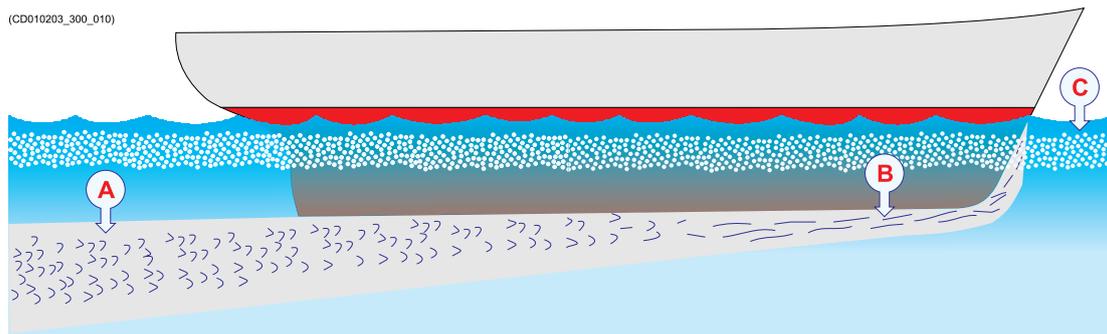
Contributions to the flow noise may also be caused by air bubbles hitting the transducer face, or by the splash caused by the waves set up by the vessel. In some cases a resonant phenomenon is set up in a hole near the hull. This sound will have a discrete frequency, while all other flow noise will have a wide frequency spectrum.

(Image from U. S. Navy in the public domain.)

Flow noise

Every object that moves through water will disturb the medium, and it will cause friction in the water. 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*

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 noises

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.

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, etc.
- **Man made noise:** Other vessels, interference
- **Precipitation noise**

In some areas, where many vessels are operating together the engine and propeller noise from other vessels might be disturbing.

Interference from hydroacoustic instruments located in other vessels may also be a limiting factor.

The sea noise is as can be expected dependent on the weather conditions. In bad weather the sea noise can be quite high.

Fishing gear noise

Whenever your fishing gear is in use, it will create noise.

A bottom trawl, for instance, is a considerable noise maker.

Still, this noise 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(s) placed on the trawl, the gear noise is one of the main contributors to the noise level.

Electrical noise

Electrical or electronic 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 voltage supply is usually the most common source of electrical noise.

At higher frequencies – where rather wide bandwidths are necessary – the noise from components, transistors or other analogue electronic may be a limiting factor.

Some means to reduce acoustic noise

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 transducer. 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

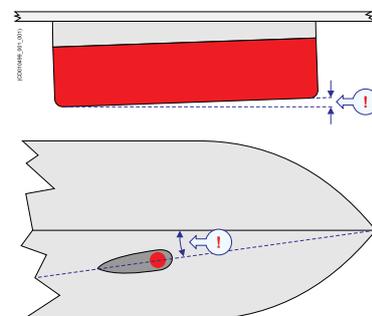
The information here must be considered as general advice. Each EK80 installation must be handled separately depending on the hull design and the other electrical and mechanical systems installed on the vessel.

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. Be especially aware of bilge keels and zinc alloy anodes. The keel should be rounded off without sharp edges.

Important

No extruding objects or any abrupt transitions should appear.



- Echo sounder transducer should be mounted with a small inclination angle (approximately 2 degrees).

Reducing machinery noise

- The transducer(s) must be installed as far away from the engine room as possible.
- The main engine and relevant auxiliary engines and equipment should be fixed to rigid foundations to avoid vibrations. Use of shock absorbers or floating rafts may sometimes reduce this noise.
- Any hull structure that may vibrate should be damped or coated to reduce the vibrations.
- 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

- The transducer should be installed as far away from the propellers as possible.
- Sufficient clearance between the propellers and the hull, the rudder and the keel should 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 ground.

Reducing rattle noise

Ensure that no parts near the transducer 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 metal conduits from as close to the transducer as possible, and all the way to the rear side of the transceiver.

- Make sure that all units are properly grounded, as this is important to avoid electrical noise.
- You must use shielded cables with correct grounding.
- Separate EK80 cables from other cables with heavy currents or transients.
- Place all high voltage power cables in metal conduits.

File formats

Topics

[About the EK80 raw data format, page 479](#)

[Configuration XML datagram, page 483](#)

[Filter binary datagram, page 485](#)

[Environment XML datagram, page 486](#)

[Parameter XML datagram, page 487](#)

[Sample binary datagram, page 487](#)

[NMEA text datagram, page 488](#)

[Annotation text datagram, page 489](#)

[MRU binary datagram, page 489](#)

About the EK80 raw data format

Saving echograms in a raw data format is a key functionality provided by the Simrad EK80 Scientific wide band echo sounder. In order to do this, a dedicated file format has been established.

Topics

- [The EK80 *.raw data file format, page 479](#)
- [EK80 versus EK60 raw data formats, page 480](#)
- [Using XML datagrams, page 480](#)
- [Numeric type definition, page 481](#)
- [Data encapsulation in binary datagrams, page 482](#)

The EK80 *.raw data file format

The datagram sequence in an EK80 raw data file is not fixed. It depends of the number of installed frequency channels.

However, it will normally be similar to the following structure.

- **Configuration:** XML datagram, type "XML0"
- **Filter:** Binary datagram, type "FIL1"
There are two filter datagrams for each channel. The first datagram contains the filter parameters from the transceiver, while the second datagram contains the filter parameters from the Processor Unit software.
- **Filter:** Binary datagram, type "FIL1"
- **Environment:** XML datagram, type "XML0"

After these first four datagrams follows sample data for each channel. The sample data are comprised of two datagrams for each channel for each ping.

- **Parameter:** XML datagram, type "XML0"
- **Sample:** Binary datagram, type "RAW3"

Note

The information in the various datagrams are linked using the time stamp and the Channel ID information.

Asynchronous with the sample data the following datagrams may be interleaved.

- **Environment:** XML datagram, type "XML0"

- **NMEA:** Binary datagram, type "NME0"
- **Annotation:** Binary datagram, type "TAG0"
- **Motion:** Binary datagram, type "MRU0"

Related topics

[About the EK80 raw data format, page 479](#)

EK80 versus EK60 raw data formats

The raw data format supported by the Simrad EK80 follows the same conventions as the format for the previous Simrad EK60.

It is also common - but not identical - to the raw data formats supported by most other Simrad scientific systems. However, in the EK80 *XML* datagrams are used more frequently, and new datagrams have been introduced.

The EK80 raw data format should be regarded as an *extension* to the EK60 format. The EK80 can read EK60 generated *.raw files, but the EK60 can not read the EK80 format.

The differences between the new and previous format are all related to the introduction of new parameters and data. In the EK80 format, the XML datagrams contain much of the information found in the EK60 Configuration and Sample datagrams.

Related topics

[About the EK80 raw data format, page 479](#)

Using XML datagrams

XML datagrams are introduced for description of parameters and data. They offer more flexibility than binary datagrams with a fixed structure, and they are not as compressed as binary datagrams.

XML datagrams are not used for the actual sample data.

The XML datagrams are simply an XML text file following the standard XML convention. Tag attributes are used to contain the information. The length of the XML file can, as with all types of datagrams, be determined from the length of the datagram given in the datagram encapsulation.

The name of the first tag defines the contents of the XML datagram type.

Currently the following datagram tags are used by the EK80 raw data file format.

- **Configuration**

The first tag <Configuration> defines the type.

This XML datagram replaces the EK60 Configuration datagram (Datagram type "CON0").

- **Environment**

The first tag `<Environment>` defines the type.

This XML datagram replaces the environment information part of the EK60 Sample datagram (Datagram type "RAW0").

- **Parameter**

The first tag `<Parameter>` defines the type.

This XML datagram replaces the parameter information part of the EK60 Sample datagram (Datagram type "RAW0").

Related topics

[About the EK80 raw data format, page 479](#)

Numeric type definition

In order to describe the data type formats in the binary datagrams, common "C" structures are used. These represent individual data blocks.

The size of the various "C" types are shown in the table.

"C" type	Contents and size
char	8-bit integer
WORD	16-bit unsigned integer
short	16-bit integer
Int	32-bit integer
long	32-bit integer
float	32-bit floating point (IEEE 754)
double	64-bit floating point (IEEE 754)
DWORDLONG	64-bit integer

Related topics

[About the EK80 raw data format, page 479](#)

Data encapsulation in binary datagrams

A standard encapsulation scheme is used for all binary data files. Each datagram is preceded by a 4 byte length tag stating the datagram length in bytes. An identical length tag is appended at the end of the datagram.

Format

```
long Length;
struct DatagramHeader
{
    long DatagramType;
    struct {
        long LowDateTime;
        long HighDateTime;
    } DateTime;
};
- -
datagram content
- -
long Length;
};
```

Description

All datagrams use the same header. The datagram type field identifies the type of datagram. ASCII quadruples are used to ease human interpretation and long term maintenance; three characters identify the datagram type and one character identifies the version of the datagram.

The *DateTime* structure contains a 64-bit integer value stating the number of 100 nanosecond intervals since January 1, 1601. This is the internal "filetime" used by the Windows NT operating system. The data part of the datagram contains any number of bytes, and its content is highly datagram dependent.

Common computers fall into two categories:

- Intel based computers write a multibyte number to file starting with the LSB (Least Significant Byte).
- HP, Sun and Motorola do the opposite. They write the MSB (Most Significant Byte) to file first.

The byte order of the length tags and all binary fields within a datagram is always identical to the native byte order of the computer that writes the data file. It is the responsibility of the software that reads the file to perform byte swapping of all multibyte numbers within a datagram if required. Byte swapping is required whenever there is an apparent mismatch between the head and the tail length tags. Hence, the two length tags may be used to identify the byte order of the complete datagram.

The Intel processors allow a multibyte number to be located at any RAM address. However, this may be different on other processors; a short (2 byte) must be located at an even address, a long (4 byte) and a float (4 byte) must be located at addresses that can be divided by four. Hence, the numeric fields within a datagram is specified with this in mind.

Related topics

[About the EK80 raw data format, page 479](#)

Configuration XML datagram

The Configuration datagram is the first datagram in the raw data file. It contains parameters that are not subject to change in the file.

Format

The basic structure, with the XML tags shown without attributes:

```
<Configuration>
<Header/>
<Transceivers>
  <Transceiver>
    <Channels>
      <Channel>
        <Transducer/>
      </Channel>
    </Channels>
  </Transceiver>
</Configuration>
```

The <Header> tag:

```
<Header
  Copyright="Copyright (c) Kongsberg Maritime AS, Norway"
  ApplicationName="EK80"
  Version="1.7.5596.4208"
  FileFormatVersion="1.01"
  TimeBias="-60"/>
```

The <Transceivers> element can hold one or more <Transceiver> elements:

```
<Transceiver
  TransceiverName="WBT 545603"
  EthernetAddress="009072085343"
  IPAddress="169.254.236.100"
  Version="[0] Ethernet: 00:90:72:08:53:43 [1]
  Parts-list: WBT 371790/D [2]
  Product: WBT
  IP Address: 169.254.236.100
  Subnet mask: 255.255.0.0
  Default gateway: 169.254.236.1
  Serial number: 545603
  Embedded software: Rev. 1.70
  FPGA TX firmware: Rev. 4
  FPGA RX firmware: Rev. 7"
  TransceiverSoftwareVersion="1.70"
  TransceiverNumber="1"
  TransceiverType="WBT"
  SerialNumber="545603">
```

Each <Transceiver> element holds one <Channels> element:

```
<Channels>
```

The <Channels> element holds one or more <Channel> elements. Example:

```
<Channel
  ChannelID="WBT 545603-15 ES120-7C"
  ChannelIdShort="ES120-7C Ser.No: 878"
  ChannelNumber="1"
  MaxTxPowerTransceiver="2000"
  PulseLength="6.4E-05;0.000128;0.000256;0.000512;0.001024"
  HWChannelConfiguration="15">
```

Each <Channel> element holds one <Transducer> element. Example:

```
<Transducer
  TransducerName="ES120-7C"
  SerialNumber="878"
  Frequency="120000"
  FrequencyMinimum="95000"
  FrequencyMaximum="160000"
  BeamType="1"
  EquivalentBeamAngle="-21"
  Gain="25.5;26.8;27;27;27"
  SaCorrection="0;0;0;0;0"
  MaxTxPowerTransducer="250"
  BeamWidthAlongship="7"
  BeamWidthAthwartship="7"
  AngleSensitivityAlongship="23"
  AngleSensitivityAthwartship="23"
  AngleOffsetAlongship="0"
  AngleOffsetAthwartship="0"
  DirectivityDropAt2XBeamWidth="0"/>
```

Description

The Configuration datagram is of type "XML0", and is identified by the <Configuration> tag.

Information are contained in the specified attributes.

The <ChannelID> is the information which links data from different datagrams in the raw file to a specific frequency channel.

Filter binary datagram

The Filter binary datagrams contains filter coefficients used for filtering the received signal.

Format

```
struct FilterDatagram
{
    DatagramHeaderDgHeader; // "FIL1"
    short Stage; // Filter stage number
    char Spare[2];
    char ChannelID[128]; // Channel identification string
    short NoOfCoefficients; // Number of complex filter coefficients
    short DecimationFactor; // Filter decimation factor
    float Coefficients[]; // Filter coefficients
};
```

Description

The filter coefficients in the Filter datagrams are used in combination with information of the transmitted signal to create the matched filter which can be used to create matched filter or pulse compressed echogram data.

The filter coefficients are complex values. Thus, the number of values found in Coefficients[] are $2 \times \text{NoOfCoefficients}$ since each complex filter coefficient consist of one real part and one imaginary part. The complex filter coefficients $F(n)$ are arranged in Coefficients[] as:

```
real(F(1)), imag(F(1)), real(F(2)), imag(F(2)), ... ,
```

Environment XML datagram

The Environment XML datagram contains environment parameters. There may be one or more Environment datagrams in the file. Absorption coefficient etc may be calculated using these parameters.

Format

Example:

```
<Environment
  Depth="100"
  Acidity="8"
  Salinity="35"
  SoundSpeed="1491.435067861"
  Temperature="10">

<Transducer
  TransducerName="Unknown"
  SoundSpeed="1490"/>

</Environment>
```

Description

The Environment XML datagram is identified by the `<Environment>` tag.

The following tags and attributes are used:

- 1 `<Environment>`
The `<Environment>` tag can hold one or more `<Transducer>` elements.
- 2 `<Transducer>`
This is for future use.

Parameter XML datagram

The Parameter XML datagram contains information of all relevant parameters at "ping" time for each channel.

Format

Example:

```
<Parameter>
  <Channel
    ChannelID="WBT 545603-15 ES120-7C"
    ChannelMode="0"
    PulseForm="1"
    FrequencyStart="95000"
    FrequencyEnd="160000"
    BandWidth="3026.39148748301"
    PulseLength="0.002048"
    SampleInterval="1.066666666666667E-05"
    TransducerDepth="0"
    TransmitPower="250"
    Slope="0.0102796052631579"/>
</Parameter>
```

Description

The Parameter XML datagram is identified by the <Parameter> tag.

The following tags and attributes are used:

- <Parameter>

The <Parameter> tag can hold one or more <Channel> elements.

Sample binary datagram

The sample datagram contains sample data from each "ping". The datagram may have different size and contain different kind of data, depending on the DataType parameter.

Format

```
struct SampleDatagram
{
  DatagramHeaderDgHeader; // "RAW3"
  char ChannelID[128]; // Channel identification string
  short Datatype;
  // Bit0 = Power
  // Bit1 = Angle
  // Bit2 = ComplexFloat16
  // Bit3 = ComplexFloat32
  // Bit8-10: Number of Complex per Samples
  char Spare[2];
  long Offset; // First sample number
  long Count; // Number of samples
  byte Samples[]; // Received sample values
};
```

Description

In this structure, the information after the "///" characters are comments to that line.

The number of values in Samples[] depends on the value of Count and the Datatype.

As an example a DataType decimal value of 1032 means that Samples[] contains ComplexFloat32 samples and that each sample consists of 4 complex numbers (one from each of the 4 transducer quadrants). In this case Samples[] consists of 4*2*Count values of 32 bit floats, since each sample consists of 4 complex numbers each consisting of one real part and one imaginary part. The sample values S(i,n) are arranged as:

```
Real(S(1,1)), Imag(S(1,1)),  
Real(S(2,1)), Imag(S(2,1)),  
Real(S(3,1)), Imag(S(3,1)),  
Real(S(4,1)), Imag(S(4,1)),  
Real(S(1,2)), Imag(S(1,2)), ...
```

NMEA text datagram

The NMEA datagram contains the original NMEA 0183 input message line including carriage return (CR) and line feed (LF).

Format

```
struct TextDatagram  
{  
    DatagramHeader DgHeader; // "NME0"  
    char Text[]; // "$GPGLL,5713.213,N....."  
};
```

Description

In this structure, the information after the "///" characters are comments to that line.

The size of the datagram depends on the message length.

Example

An example GLL NMEA position message:

```
$GPGLL,5713.213,N,1041.458,E<cr><lf>
```

Example

An example NMEA speed message line:

```
$HUVTG,245.0,T,245.0,M,4.0,N,2.2,K<cr><lf>
```

Annotation text datagram

The annotation datagram contains comment text that you have entered, for example "dangerous wreck".

Format

```
struct TextDatagram
{
    DatagramHeader DgHeader; // "TAG0"
    char Text[]; // "Dangerous wreck"
};
```

Description

In this structure, the information after the "//" characters are comments to that line.

The text string is zero terminated. The size of the complete datagram depends on the annotation length.

MRU binary datagram

The MRU binary datagram contains motion sensor data at a given time..

Format

```
struct MRUDatagram
{
    DatagramHeaderDgHeader; // "MRU0"
    float Heave;
    float Roll;
    float Pitch;
    float Heading;
};
```

Description

In this structure, the information after the "//" characters are comments to that line.

Data subscription and remote control

Topics

[About data subscription and remote control, page 491](#)

[Overview of the data subscriptions, page 492](#)

[Data subscription processes, page 493](#)

[Data subscription types, page 506](#)

[Parameter descriptions, page 519](#)

About data subscription and remote control

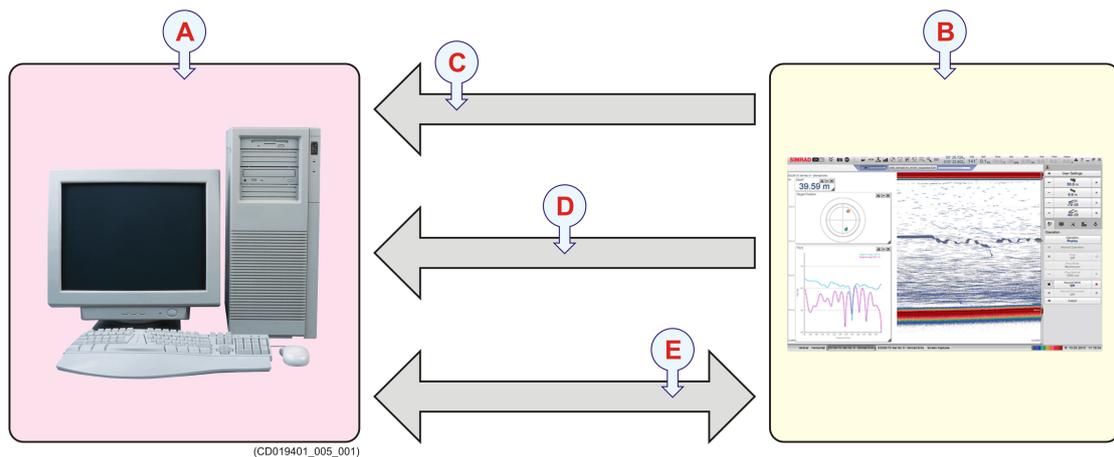
The Simrad EK80 Scientific wide band echo sounder allows you subscribe to echo data, and to control the system operation from your own remote application. You can thus program your an application to control the EK80 operations. Such operations may for example include start/stop pinging, changing ping interval, or start/stop data recording.

By means of your application you can also subscribe to data from the EK80. This means that you can ask the EK80 to continuously send various data (for example Depth data, Target Strength data or Integration data) to your application.

The communication between the EK80 program and your own application is done by exchanging UDP messages via the local area network (LAN).

Command and response messages are all text messages on XML format.

Subscribed data updates are binary data structures, these must be decoded using the relevant information about the data structure.



- A** Local computer (may be connected to the local area network) running your own client application.
- B** Processor Unit (computer) running the EK80 program ("server application").
- C** Subscriber parameter updates (UDP/Binary)
- D** Subscribed data updates (UDP/Binary)
- E** Commands and responses (UDP/XML)

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

Overview of the data subscriptions

A specific process must be implemented to establish data subscription and remote control.

- 1 Request server information (from the EK80 Processor Unit)
- 2 Connect to server (Processor Unit)
- 3 Keep connection alive
- 4 Issue commands on server (Processor Unit)

Subscription of data:

- a Create data subscriptions
- b Handle data
- c Change data subscriptions
- d Destroy data subscriptions

Parameter management:

- a Get parameter
- b Set parameter
- c Start parameter notifications
- d Stop parameter notifications

- 5 Disconnecting from server (EK80 Processor Unit)

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

Related topics

- [Request server information, page 493](#)
- [Connecting to server, page 494](#)
- [Keep connection alive, page 496](#)
- [Issue commands to the server, page 497](#)
- [Collecting data, page 499](#)
- [Parameter management, page 503](#)
- [Disconnecting from server, page 505](#)

Data subscription processes

Topics

[Request server information, page 493](#)

[Connecting to server, page 494](#)

[Keep connection alive, page 496](#)

[Issue commands to the server, page 497](#)

[Collecting data, page 499](#)

[Parameter management, page 503](#)

[Disconnecting from server, page 505](#)

Request server information

Before you connect to the Processor Unit running the EK80 program, your application must obtain information about the IP address and command port number used by the Processor Unit.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

RequestServerInfo

Send the following **RequestServerInfo** message to the specific IP address of the Processor Unit, or broadcast the message to receive information from all computers on the local area network.

The message must be send to the user datagram protocol (UDP) port number found in the **Local port** field on the **Remote Control - Server** page in the **Installation** dialog box in the EK80 program.

```
struct RequestServerInfo
{
    char Header[4]; // "RSI\0"
};
```

ServerInfo2

The EK80 Processor Unit will respond to the requesting client application with a message containing information about the EK80 program. The content of the **ServerInfo2** message is shown below.

```
struct ServerInfo2
{
    char Header[4]; // "SI2\0"
    char ApplicationType[64];
    char ApplicationName[64]; // Name of the current server application (EK80)
    char ApplicationDescription[128]; // Description of the current application
    long ApplicationID; // ID of the current application
    long CommandPort; // Port number to send commands to
    long Mode; // If the server application (EK80) is running
               // against the local data source or a remote data source
    char HostName[64]; // IP address of the Processor Unit the server
               // application is running on
};
```

CommandPort

The EK80 Processor Unit UDP port number **CommandPort** must be used from now on to send commands to the EK80 program.

Related topics

[Overview of the data subscriptions, page 492](#)

Connecting to server

Before commands can be sent to the EK80 program, your client application must identify itself to the Processor Unit server application by sending a connect command, the **ConnectRequest**. This connect command must contain user account and password information..

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

ConnectRequest

The contents of the **ConnectRequest** message is shown below.

```
struct ConnectRequest
{
    char Header[4]; // "CON\0"
    char ClientInfo[1024]; // e.g. "Name:Simrad;Password:\0"
};
```

Response

The EK80 server application will respond with a **Response** message.

- If the **ConnectRequest** command succeeded, it will contain at least the client identification.
- If the **ConnectRequest** command failed, it will contain an error messages.

```
struct Response
{
  char Header[4]; // "RES\0"
  char Request[4]; // "CON/0"
  char MsgControl[22]; // "\0"
  char MsgResponse[1400]; // Response text containing result of connection request
};
```

The **MsgResponse** field consist of **ResultCode** and **Parameters**.

- 1 The **ResultCode** contains the result of the **ConnectRequest** command. The following values are used:
 - **S_OK**: The operation was successful.
 - **E_ACCESSDENIED**: The operation failed due to unknown account or wrong password.
 - **E_FAIL**: The operation failed due to an unspecified error.
- 2 The **Parameters** is a comma separated list of various "name:value" pairs that may be present. These parameters are only provided if the **ConnectRequest** was successful. The following values are used:
 - **ClientID**: identification of the current client, to be used in all further communication with the server application
 - **AccessLevel**: general access level for the current client

A successful connection will for example provide a **MsgResponse** message containing:

```
ResultCode:S_OK,
Parameters:{ClientID:1,AccessLevel:1}\0
```

In case the connect command fails, the **ResponseField** will contain a **ResultInfo** field. This **ResultInfo** field will contain text describing the failure.

Related topics

[Overview of the data subscriptions, page 492](#)

Keep connection alive

Once the client application on the local computer is connected to the server application on the EK80 Processor Unit, a two-way monitoring of the communication status must be started. This means that both the client and the server applications must send an "alive" message, **AliveReport**, every second.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

AliveReport

The content of the **AliveReport** message is shown using C-code.

```
struct AliveReport
{
    char Header[4]; // "ALI\0"
    char Info[1024]; // e.g. "ClientID:1,SeqNo:1\0"
};
```

SeqNo

The **SeqNo** part of the **Info** field shall contain the sequence number of the next request message from the client application to the EK80 server. The sequence number shall start on 1. The Processor Unit will use this to detect if any messages from the client have been lost. If a loss is detected, the Processor Unit will issue a re-transmit request to the client application.

The **AliveReportDef** message from the EK80 to the client application may contain (for example):

```
SeqNo:1\0
```

Similar, the **SeqNo** part of the **Info** field shall contain the sequence number of the next response message from the EK80 server to the client. The client application can use this to detect if any message from the EK80 has been lost, and may then issue a re-transmit request to the Processor Unit.

Related topics

[Overview of the data subscriptions, page 492](#)

Issue commands to the server

Once the local computer with the client application is connected to the EK80 Processor Unit with the server application (the EK80 program), specific messages are used to issue commands.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

Request

A **Request** message must be sent to the server application (the EK80 program) in order to issue a command on one of the available command targets in the server application. An example of the main elements of a command request is shown below.

```
struct Request
{
    char Header[4]; // "REQ\0"
    char MsgControl[22]; // Sequence no, Current msg no, Total msg no
    char MsgRequest[1400]; // XML based command request
};
```

The **MsgControl** field consists of the following parts:

- 1 **Sequence number**: increments for each request message sent to the server.
- 2 **Current message**: contains the current message in case a request must be split into several UDP messages.
- 3 **Total message**: contains the total number of messages the current request consists of.

If the contents of **MsgControl** is "2,1,3\0" it means that the current UDP message is the second request message sent from the client to the server, and that the current message is message number 1 of a request that consists of a total of three UDP messages.

The contents of the **MsgRequest** depend on the current command target and will be described in detail later. For the moment it is enough to say that the format of the request is XML based and that the request must specify a command target, a method on the command target and any input parameters relevant for the current method. The general structure of a request is shown below.

```
<request>
  <clientInfo>
    <cid>clientid</cid>
    <rid>requestid</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>xx</targetComponent>
  <method>
    <yy>
      <zz></zz>
    </yy>
  </method>
</request>
```

where:

- **clientid** = client identification
- **requestid** = request identification
- **xx** = the name of the current command target
- **yy** = the name of the current method
- **zz** = any parameters of the current method

Response

The server application (the EK80 program) will respond with a **Response** message as shown below.

```
struct Response
{
  char Header[4]; // "RES\0"
  char Request[4]; // "REQ\0"
  char MsgControl[22]; // Sequence no, Current msg no, Total msg no
  char MsgResponse[1400]; // XML based response text
  // containing result of command request
};
```

The contents of the **Response** depend on the current command target and will be described in detail later. For the moment it is enough to say that the format of the response is XML based and that the response contains the result, any error messages, and any output parameters relevant for the current method. The general structure of a response is shown below.

```
<response>
  <clientInfo>
    <cid dt="3">clientid</cid>
    <rid dt="3">requestid</rid>
  </clientInfo>
  <fault>
    <detail>
      <errorcode dt="3">0</errorcode>
    </detail>
  </fault>
  <yyResponse>
    <zz dt="3"></zz>
  </yyResponse>
</response>
```

where:

- **clientid** = client identification
- **requestid** = request identification
- **error code** = the result of the operation. 0 = OK
- **yy** = the name of the current method
- **zz** = any parameters of the current method

Related topics

[Overview of the data subscriptions, page 492](#)

Collecting data

In order to collect echo sounder data from the server application (the EK80 program), commands must be sent to the **RemoteDataServer** component of the server application.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

The following methods/commands are available.

- Create data subscription
- Handling data
- Change data subscription
- Destroy data subscription

For all commands a **Request** message must be sent from the client application on the local computer to the Processor Unit. In the following sections only the contents of the **Request** field of the **Request** will be described.

For all commands a **Response** message will be sent from the Processor Unit to the client application. In the following sections only the contents of the **Response** field of the **Response** will be described.

Create data subscription

The method part of the request shall be set to **Subscribe**. The **Subscribe** method is defined with the following input parameters.

- **RequestedPort**: The local port on the client application that the data should be sent to
- **DataRequest**: The actual specification of the subscription

An example of the contents of the **Request** field of a **Subscribe** command to the **RemoteDataServer** is shown below:

```
<request>
  <clientInfo>
    <cid>1</cid>
    <rid>1</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>RemoteDataServer</targetComponent>
  <method>
    <Subscribe>
      <requestedPort>12345</requestedPort>
      <dataRequest>BottomDetection</dataRequest>
    </Subscribe>
  </method>
</request>
```

The server application will respond with a **Response** message. The **Subscribe** method has the following output parameters:

- **SubscriptionID**: This is the identification of the current subscription. It can be used to differentiate between multiple subscriptions on the same port.

An example of the contents of the **Response** field of a **Subscribe** command to the **RemoteDataServer** is shown below.

```
<response>
  <clientInfo>
    <cid dt="3">1</cid>
    <rid dt="3">1</rid>
  </clientInfo>
  <fault>
    <detail>
      <errorcode dt="3">0</errorcode>
    </detail>
  </fault>
  <SubscribeResponse>
    <subscriptionID dt="3"></subscriptionID>
  </SubscribeResponse>
</response>
```

Handling data

Data from the **RemoteDataServer** are wrapped in a **ProcessedData** structure.

```
struct ProcessedData
{
  char Header[4]; // "PRD\0"
  long SeqNo; // Sequence number of the current UDP message
  long SubscriptionID; // Identification of the current data
  unsigned short CurrentMsg; // Current message number
  unsigned short TotalMsg; // Total number of UDP messages
  unsigned short NoOfBytes; // Number of bytes in the following data field
  unsigned short Data[]; // Actual data
};
```

If the amount of data exceeds the limit of one UDP message, the data will be split into multiple UDP messages. The **TotalMsg** field contains the number of UDP messages for the current data. This is identified with any number larger than 1.

The **CurrentMsg** field contains the current message number out of the total number of messages.

The **Data** field shall be decoded according to the specified output structure from the subscription described in section *Data subscription types*.

Change data subscription

The method part of the request shall be set to **ChangeSubscription**. The **ChangeSubscription** method has the following parameters.

- **subscriptionID**: The id of the subscription that should be changed
- **dataRequest**: The actual specification of the subscription.

This is described in the section *Data subscription types*.

An example of the contents of the **Request** field of a **ChangeSubscription** command to the **RemoteDataServer** is shown below.

```
<request>
  <clientInfo>
    <cid>1</cid>
    <rid>1</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>RemoteDataServer</targetComponent>
  <method>
    <ChangeSubscription>
      <subscriptionID>1</subscriptionID>
      <dataRequest>BottomDetection</dataRequest>
    </ChangeSubscription>
  </method>
</request>
```

The server application will respond with a **Response** message. The **ChangeSubscription** method does not have any output parameters.

An example of the contents of the **Response** field of a **ChangeSubscription** command to the **RemoteDataServer** is shown below.

```
<response>
  <clientInfo>
    <cid dt="3">1</cid>
    <rid dt="3">1</rid>
  </clientInfo>
  <fault>
    <detail>
      <errorCode dt="3">0</errorCode>
    </detail>
  </fault>
  <ChangeSubscriptionResponse></ChangeSubscriptionResponse>
</response>
```

Destroy data subscription

The method part of the request shall be set to **Unsubscribe**. The **Unsubscribe** method has the following parameters.

- **subscriptionID**: The identification of the subscription that shall be closed

An example of the contents of the **szRequest** field of an **Unsubscribe** command to the **RemoteDataServer** is shown below.

```
<request>
  <clientInfo>
    <cid>1</cid>
    <rid>1</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>RemoteDataServer</targetComponent>
  <method>
    <Unsubscribe>
      <subscriptionID>1</subscriptionID>
    </Unsubscribe>
  </method>
</request>
```

The server application will respond with a **ResponseDef** message. The **Unsubscribe** method does not have any output parameters.

An example of the contents of the **Response** field of an **Unsubscribe** command to the **RemoteDataServer** is shown below.

```
<response>
  <clientInfo>
    <cid dt="3">1</cid>
    <rid dt="3">1</rid>
  </clientInfo>
  <fault>
    <detail>
      <errorCode dt="3">0</errorCode>
    </detail>
  </fault>
  <UnsubscribeResponse></UnsubscribeResponse>
</response>
```

Related topics

[Overview of the data subscriptions, page 492](#)

[About data subscription types, page 506](#)

[Data subscription type: Bottom detection, page 507](#)

[Data subscription type: Target strength \(TS\) detection, page 508](#)

[Data subscription type: Target strength \(TS\) detection chirp, page 509](#)

[Data subscription type: Sample data, page 510](#)

[Data subscription type: Echogram, page 512](#)

[Data subscription type: Targets echogram, page 513](#)

[Data subscription type: Integration, page 514](#)

[Data subscription type: Integration chirp, page 515](#)

[Data subscription type: Targets integration, page 516](#)

[Data subscription type: Noise spectrum, page 518](#)

Parameter management

In order to set/get parameters in the server application (the EK80 program), commands must be sent to the **ParameterServer** component of the server application.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

The following methods/commands are available.

- Get parameter value/attribute (with input and output parameters)
- Set parameter value/attribute (with input and output parameters)
- Subscribe on parameter value/attribute change notifications
- Unsubscribe parameter notifications

Get parameter value/attribute

The method part of the request shall be set to **GetParameter**. The server application (the EK80 program) will respond with a **Response** message.

The **GetParameter** method has the following input parameters:

- **ParamName**: Full name of the current parameter
- **Time**: The time where the value should be read (only available for some parameters). Use 0 (zero) if the latest value is wanted.

An example of the contents of the **Request** field of a **GetParameter** command to the **ParameterServer** is shown below.

```
<request>
  <clientInfo>
    <cid>1</cid>
    <rid>28</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>ParameterServer</targetComponent>
  <method>
    <GetParameter>
      <paramName>RemoteCommandDispatcher/ClientTimeoutLimit</paramName>
      <time>0</time>
    </GetParameter>
  </method>
</request>
```

The **GetParameter** method has the following output parameters:

- **Value**: The value of the parameter
- **Time**: The time when the parameter was updated

An example of the contents of the **Response** field of a **GetParameter** command to the **ParameterServer** is shown below.

Set parameter value/attribute

The method part of the request shall be set to **SetParameter**. The server application (the EK80 program) will respond with a **Response** message.

The **SetParameter** method has the following input parameters:

- **ParamName**: Full name of the current parameter
- **paramValue**: The new value to update the parameter with
- **paramType**: The data type of the **paramValue** field

An example of the contents of the **Request** field of a **SetParameter** command to the **ParameterServer** is shown below.

```
<request>
  <clientInfo>
    <cid>1</cid>
    <rid>28</rid>
  </clientInfo>
  <type>invokeMethod</type>
  <targetComponent>ParameterServer</targetComponent>
  <method>
    <SetParameter>
      <paramName>RemoteCommandDispatcher/ClientTimeoutLimit</paramName>
      <paramValue>60</paramValue>
      <paramType>3</paramType>
    </SetParameter>
  </method>
</request>
```

The **SetParameter** method does not have any output parameters.

An example of the contents of the **Response** field of a **SetParameter** command to the **ParameterServer** is shown below.

```
<response>
  <clientInfo>
    <cid dt="3">1</cid>
    <rid dt="3">28</rid>
  </clientInfo>
  <fault>
    <detail>
      <errorcode dt="3">0</errorcode>
    </detail>
  </fault>
</response>
```

Related topics

[Overview of the data subscriptions, page 492](#)

[About parameters, page 519](#)

[Ping based parameters, page 519](#)

[Asynchronous parameters, page 521](#)

[Operation mode parameters, page 522](#)

Disconnecting from server

The client application on the local computer must send a **DisconnectRequestDef** message to the server application (the EK80 program) when the client is finished with its operations.

Note

In this context the EK80 Processor Unit is regarded as a "server", while the EK80 program is the "server application".

The program you make yourself to run on a local computer is referred to as the "client application".

The parameters are:

- **Header:** DIS\0
- **szClientInfo:** Name:Simrad;Password:\0

Related topics

[Overview of the data subscriptions, page 492](#)

Data subscription types

Topics

[About data subscription types, page 506](#)

[Data subscription type: Bottom detection, page 507](#)

[Data subscription type: Target strength \(TS\) detection, page 508](#)

[Data subscription type: Target strength \(TS\) detection chirp, page 509](#)

[Data subscription type: Sample data, page 510](#)

[Data subscription type: Echogram, page 512](#)

[Data subscription type: Targets echogram, page 513](#)

[Data subscription type: Integration, page 514](#)

[Data subscription type: Integration chirp, page 515](#)

[Data subscription type: Targets integration, page 516](#)

[Data subscription type: Noise spectrum, page 518](#)

About data subscription types

Specific data subscription types are used to enable the data subscription and remote control.

All data subscriptions require the **ChannelID** (channel identifier) for the frequency channel from which the subscription data is requested. A comma separated list of available identifiers can be obtained using the **ParameterServer** component to get the parameter **TransceiverMgr Channels**.

The data output will always start with a 64-bit integer time value, which identifies the number of 100 nanoseconds intervals that has elapsed since January 1, 1601.

If a parameter is skipped in the subscription input string it will be replaced by the default value.

The decoding of the subscription will be case insensitive.

In the output data to be received by external devices, the information about the current structure length is given. From this information, the number of elements in an array may be calculated.

The following data subscription types are used:

- Bottom detection
- Target strength (TS) detection
- Sample data

- Echogram
- Targets echogram
- Integration
- Targets integration

Related topics

[Collecting data, page 499](#)

[Data subscription type: Bottom detection, page 507](#)

[Data subscription type: Target strength \(TS\) detection, page 508](#)

[Data subscription type: Sample data, page 510](#)

[Data subscription type: Echogram, page 512](#)

[Data subscription type: Targets echogram, page 513](#)

[Data subscription type: Integration, page 514](#)

[Data subscription type: Targets integration, page 516](#)

Data subscription type: Bottom detection

The bottom detection data subscription string is **BottomDetection**.

Input

Parameters	Range	Default	Unit
UpperDetectorLimit	(0,20000)	0	m
LowerDetectorLimit	(0,20000)	1000	m
BottomBackstep	(-200,100)	-50	dB

Output

```

struct StructBottomDepthHeader
{
    DWORDLONG dlTime;
};

struct StructBottomDepthData
{
    double dBottomDepth; // detected bottom depth [meter]
    double dReflectivity; // bottom surface backscatter [dB]
    double dVesselLogDistance; // sailed distance [nmi]
};

struct StructBottomDepth
{
    StructBottomDepthHeader BottomDepthHeader;
    StructBottomDepthData BottomDepthData;
};

```

Example

Building a **BottomDetection** subscription string:

```
BottomDetection,
ChannelID=<ChannelID>,
UpperDetectorLimit=3.0,
LowerDetectorLimit=500.0,
BottomBackstep=-60.0
```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Target strength (TS) detection

The target strength (TS) detection data subscription string is **TSDetection**.

Input

Parameters	Range	Default	Unit
sLayerType	(Surface, Bottom, Pelagic)	Surface	None
Range	(0,20000)	10000	m
RangeStart	(0,20000)	0	m
MinTSValue	(-120,50)	-50.0	dB
MinEchoLength	(0,20)	0.8	None
MaxEchoLength	(0,20)	1.8	None
MaxGainCompensation	(0,12)	6.0	None
MaxPhaseDeviation	(0,100)	8.0	Phase steps

Output

```
struct StructTSDataHeader
{
    DWORDLONG dlTime;
};

struct StructEchoTrace
{
    double Depth; // Target depth [meter]
    double TSComp; // Compensated TS [dB]
    double TSUncomp; // Uncompensated TS [dB]
    double AlongshipAngle; // Alongship angle [deg]
    double AthwartshipAngle; // Athwartship angle [deg]
    double sa; // Sa value for target
};

struct StructTSDataBody
{
    WORD NoOfEchoTraces; // Number of targets accepted in ping
    StructEchoTrace EchoTraceElement[100];
};
```

```

struct StructTSDData
{
    StructTSDDataHeader TSDDataHeader;
    StructTSDDataBody TSDDataBody;
};

```

Example

Building a **TSDetection** subscription string:

```

TSDetection,
ChannelID=<ChannelID>,
LayerType=Surface,
Range=200,
RangeStart=3,
MinTSValue=-55,
MinEcholength=0.7,
MaxEcholength=2.0,
MaxGainCompensation=6.0,
MaxPhasedeviation=7.0

```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Target strength (TS) detection chirp

The Target strength detection chirp data subscription string is **TSDetectionChirp**.

Input

Parameters	Range	Default	Unit
LayerType	(Surface, Bottom, Pelagic)	Surface	None
Range	(0,20000)	10000	m
RangeStart	(0,20000)	0	m
MinTSValue	(-120,50)	-50	dB
RangeBeforeTarget	(0,?)	0.15	m
RangeAfterTarget	(0,?)	0.15	m
MaxGainCompensation	(0,12)	6.0	dB
MaxPhaseDeviation	(0,100)	25	deg

Output

```

struct StructEchoTraceWBT
{
double Depth;
double TSComp;
double TSUncomp;
double AlongshipAngle;
double AthwartshipAngle;
double sa;
float frequencyLimits[2];
float uncompensatedFrequencyResponse[1000];
float compensatedFrequencyResponse[1000];
int withinMaxBeamCompensation[1000];
};

struct StructTSDataWBT
{
DWORDLONG dlTime;
WORD NoOfEchoTraces;
StructEchoTraceWBT EchoTraceElement[100];
};
    
```

Example

Building a **TSDetectionChirp** subscription string:

```

TSDetectionChirp,
ChannelID=<ChannelID>
LayerType=Surface,
Range=200,
RangeStart=3,
MinTSValue=-55,
RangeBeforeTarget=0.15,
RangeAfterTarget=0.7,
MaxGainCompensation=6.0,
MaxPhasedeviation=25.0
    
```

Related topics

[Collecting data, page 499](#)

Data subscription type: Sample data

The target strength (TS) detection data subscription string is **SampleData**.

Input

Parameters	Range	Default	Unit
SampleDataType	(Power, Angle, Sv, Sp, Ss, TVG20, TBG40, PowerAngle)	Power	None
Range	(0,20000)	100	m
RangeStart	(0,20000)	0	m

Output for Power, Angle, Sv, Sp, Ss, TVG20 and TVG40

```

struct StructSampleDataHeader
{
    DWORDLONG dlTime;
};

struct StructSampledataArray
{
    short nSampleDataElement[30000]; // 16-bits sample in logarithmic format
};

struct StructSampleData
{
    StructSampleDataHeader SampleDataHeader;
    StructSampledataArray SampledataArray;
};

```

Output for PowerAngle

```

struct StructSampleDataHeader
{
    DWORDLONG dlTime;
};

struct StructSamplePowerAngleArray
{
    short nSampleDataElement[60000]; // Composite sample array for power and angle
};

struct StructSamplePowerAngleValues
{
    int nPowerValues; // Number of power samples
    int nAngleValues; // Number of angle values
};

struct StructSamplePowerAngle
{
    StructSampleDataHeader SampleDataHeader;
    StructSamplePowerAngleValues SamplePowerAngleValues;
    StructSamplePowerAngleArray SamplePowerAngleArray;
};

```

Example

Building a **SampleData** subscription string:

```

SampleData,
ChannelID=<ChannelID>,
SampleDataType=Power,
Range=100,
RangeStart=10

```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Echogram

The echogram data subscription string is **Echogram**.

Input

Parameters	Range	Default	Unit
PixelCount	(0,10000)	500	None
Range	(0,20000)	100	m
RangeStart	(0,20000)	0	m
TVGType	(Pr, Sv, Sp, TS, SpAndTS)	Sv	None
EchogramType	(Surface, Bottom, Trawl)	Surface	None
CompressionType	(Mean, Peak)	Mean	None
ExpansionType	(Interpolation, Copy)	Interpolation	None

Output

```

struct StructEchogramHeader
{
    DWORDLONG dlTime;
};

struct StructEchogramArray
{
    short nEchogramElement[30000]; // 16-bit logarithmic format
};

struct StructEchogram
{
    StructEchogramHeader EchogramHeader;
    StructEchogramArray EchogramArray;
};
    
```

Example

Building a **Echogram** subscription string:

```

Echogram,
ChannelID=<ChannelID>,
PixelCount=500,
Range=100,
RangeStart=0,
TVGType=TS,
EchogramType=Surface,
CompressionType=Mean,
ExpansionType=Interpolation
    
```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Targets echogram

The targets echogram data subscription string is **TargetsEchogram**.

This subscription will only produce an echogram array containing detected echo traces with their compensated target strength (TS) values between the transmit pulse and the bottom. Below bottom the selected TVG type is used.

Input

Parameters	Range	Default	Unit
PixelCount	(0,10000)	500	None
Range	(0,20000)	100	m
RangeStart	(0,20000)	0	m
TVGType	(TS, SP, Ts)	Must be set	None
EchogramType	(Surface, Bottom)	Surface	None
MinTSValue	(-120,50)	-50	dB
MinEchoLength	(0,20)	0.8	None
MaxEchoLength	(0,20)	1.8	None
MaxGainCompensation	(0,12)	6.0	dB
MaxPhaseDeviation	(0,100)	8.0	Phase steps

Output

```

struct StructEchogramHeader
{
    DWORDLONG dlTime;
};

struct StructEchogramArray
{
    short nEchogramElement[30000];
};

struct StructEchogram
{
    StructEchogramHeader EchogramHeader;
    StructEchogramArray EchogramArray;
};

```

Example

Building a TargetsEchogram subscription string:

```
TargetsEchogram,
ChannelID=<ChannelID>,
PixelCount=500,
Range=100,
RangeStart=0,
TVGType=TS,
EchogramType=Surface,
MinTSValue=-55.0,
MinEcholength=0.7,
MaxEcholength=2.0,
MaxGainCompensation=6.0,
MaxPhasedeviation=7.0
```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Integration

The integration data subscription string is **Integration**.

The update of Sa will be enabled by setting the **Integration State** to start. If the update parameter is set to **Update Ping**, the new Sa value is received for every ping. If the **Update Accumulate** is set, the Sa is received only when the **Integration State** changes to *Stop*.

Input

Parameters	Range	Default	Unit
LayerType	(Surface, Bottom, Pelagic)	Surface	None
IntegrationState	(Start, Stop)	Start	None
Update	(UpdatePing, UpdateAccumulate)	UpdatePing	None
Range	(0,20000)	100	m
RangeStart	(0,20000)	10	m
Margin	(0,200)	1	m
SvThreshold	(-200,100)	-100	dB

Output

```

struct StructIntegrationDataHeader
{
    DWORDLONG dlTime;
};

struct StructIntegrationDataBody
{
    double dSa; // integrated value [m2/nmi2]
};

struct StructIntegrationData
{
    StructIntegrationDataHeader IntegrationDataHeader;
    StructIntegrationDataBody IntegrationDataBody;
};

```

Example

Building a **Integration** subscription string:

```

Integration,
ChannelID=<ChannelID>,
State=Start,
Update=UpdatePing,
LayerType=Surface,
Range=100,
RangeStart=10,
Margin=0.5,
SvThreshold=-100.0

```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Integration chirp

The Integration chirp data subscription string is **IntegrationChirp**.

Input

Parameters	Range	Default	Unit
LayerType	(Surface, Bottom, Pelagic)	Surface	None
IntegrationState	(Start,Stop)	Start	None
Update	(UpdatePing, UpdateAccumulate)	Update ping	None
Range	(0,20000)	100	m
RangeStart	(0,20000)	10	m
Margin	(0,200)	1	m

Parameters	Range	Default	Unit
SvThreshold	(-200,100)	-100	dB
SvBinOverlap	(0,100)	50	%

Output

```

struct StructIntegrationDataWBT
{
    DWORDLONG dlTime;
    double dSa;
    double Distance;
    float frequencyLimits[2];
    float SVFrequencies[1000];
};
    
```

Example

Building a **IntegrationChirp** subscription string:

```

Integration,
ChannelID=<ChannelID>
State=Start,
Update=UpdatePing,
Layertype=Surface,
Range=100,
Rangestart=10,
Margin=0.5,
SvThreshold=-100.0,
SvBinOverlap=50
    
```

Related topics

[Collecting data, page 499](#)

Data subscription type: Targets integration

The targets integration data subscription string is **TargetsIntegration**.

This is a composite subscription where target strength (TS) detection and integration parameters must be set. The Sa value is taken only from the accepted single echo trace inside the range.

Input

Parameters	Range	Default	Unit
sLayerType	(Surface, Bottom, Pelagic)	Surface	None
sIntegrationState	(Start, Stop)	Start	None
Update	(UpdatePing, UpdateAccumulate)	UpdatePing	None
Range	(0,20000)	100	m

Parameters	Range	Default	Unit
RangeStart	(0,20000)	10	m
Margin	(0,200)	1	m
SvThreshold	(-200,100)	-100	dB
MinTSValue	(-120,50)	-50	dB
MinEchoLength	(0,20)	0.8	None
MaxEchoLength	(0,20)	1.8	None
MaxGainCompensation	(0,12)	6.0	dB
MaxPhaseDeviation	(0,100)	8.0	Phase steps

Output

```

struct StructIntegrationDataHeader
{
    DWORDLONG dlTime;
};

struct StructIntegrationDataBody
{
    double dSa; // integrated value from single echo trace [m2/nmi2]
};

struct StructIntegrationData
{
    StructIntegrationDataHeader IntegrationDataHeader;
    StructIntegrationDataBody IntegrationDataBody;
};

```

Example

Building a **TargetsIntegration** subscription string:

```

TargetsIntegration,
ChannelID=<ChannelID>,
State=Start,
Layertype=Surface,
Range=100,
Rangestart=10,
Margin=0.5,
SvThreshold=-100.0,
MinTSValue=-55.0,
MinEcholength=0.7,
MaxEcholength=2.0,
MaxGainCompensation=6.0,
MaxPhasedeviation=7.0

```

Related topics

[Collecting data, page 499](#)

[About data subscription types, page 506](#)

Data subscription type: Noise spectrum

The noise spectrum data subscription string is **NoiseSpectrum**.

Input

Parameters	Range	Default	Unit
Range	(0,20000)	100	m
RanegStart	(0,20000)	10	m
State	(Start,Stop)	Start	None

Output

```
struct StructNoiseSpectrumData
{
    DWORDLONG dlTime;
    float NoiseLevel[1000];
};
```

Example

Building a **NoiseSpectrum** subscription string:

```
NoiseSpectrum,
ChannelID=<ChannelID>,
Range=100,
Rangestart=10,
State=Start
```

Related topics

[Collecting data, page 499](#)

Parameter descriptions

Topics

[About parameters, page 519](#)

[Ping based parameters, page 519](#)

[Asynchronous parameters, page 521](#)

[Operation mode parameters, page 522](#)

About parameters

The **ParameterServer** component can be used to access asynchronous and ping based parameters. The parameters can be "read", "set" or "subscribed" to. A subscription will notify only when the parameter's value is changed.

Parameters identified as "read only" (R/O) can not be set. Some of them, for example sensor parameters, can be set, but the new value will immediately be overwritten if an active sensor is connected.

The parameter name must be used when working with parameters as described in section *Parameter management*.

The following parameter types are used:

- Ping based parameters
- Asynchronous parameters
- Operation mode parameters

Related topics

[Parameter management, page 503](#)

[Ping based parameters, page 519](#)

[Asynchronous parameters, page 521](#)

[Operation mode parameters, page 522](#)

Ping based parameters

Description	Parameter name	R/O	Range	Unit
List of ChannelID's	TransceiverMgr / Channels	Yes	N/A	-
Frequency	TransceiverMgr / <ChannelID> / Frequency	Yes	1.000 to 1.000.000	Hz
Pulse length	TransceiverMgr / <ChannelID> / PulseLength	No	0,000 to 0,065535	sec

Description	Parameter name	R/O	Range	Unit
Sample interval	TransceiverMgr / <ChannelID>/ SampleInterval	No	0,000010 to 0,065535	sec
Transmit power	TransceiverMgr/ <ChannelID>/ TransmitPower	No	0 to 10.000	W
Absorption Coefficient	TransceiverMgr/ <ChannelID>/ AbsorptionCoefficient	Yes	0,0 to 0,3	dB/m
Sound velocity	TransceiverMgr/ <ChannelID>/ SoundVelocity	No	1.400 to 1.700	m/s
Transducer name	TransceiverMgr/ <ChannelID>/ TransducerName	Yes	N/A	-
Transducer depth	TransceiverMgr/ <ChannelID>/ TransducerDepth	No	0 to 10.000	m
Equivalent beam angle	TransceiverMgr/ <ChannelID>/ EquivalentBeamAngle	No	-100 to 0	dB
Angle sensitivity alongship	TransceiverMgr/ <ChannelID>/ AngleSensitivityAlongship	No	0 to 100	el.deg/mec.deg
Angle sensitivity athwartship	TransceiverMgr/ <ChannelID>/ AngleSensitivityAthwartship	No	0 to 100	el.deg/mec.deg
Beamwidth alongship	TransceiverMgr/ <ChannelID>/ BeamWidthAlongship	No	0 to 100	deg
Beamwidth athwartship	TransceiverMgr/ <ChannelID>/ BeamWidthAthwartship	No	0 to 100	deg
Angle offset alongship	TransceiverMgr/ <ChannelID>/ AngleOffsetAlongship	No	-10 to 10	deg
Angle offset athwartship	TransceiverMgr/ <ChannelID>/ AngleOffsetAthwartship	No	-10 to 10	deg
Gain	TransceiverMgr/ <ChannelID>/ Gain	No	1 to 100	dB
Sa correction	TransceiverMgr/ <ChannelID>/ SaCorrection	No	-10 to 10	dB
Ping time	TransceiverMgr/ PingTime	Yes	2E64	100 ns step
Vessel latitude	TransceiverMgr/ Latitude	No	-90 to 90	deg
Vessel longitude	TransceiverMgr/ Longitude	No	-180 to 180	deg

Description	Parameter name	R/O	Range	Unit
Vessel heave	TransceiverMgr/ Heave	No	-100 to 100	m
Vessel roll	TransceiverMgr/ Roll	No	-90 to 90	deg
Vessel pitch	TransceiverMgr/ Pitch	No	-90 to 90	deg
Vessel distance	TransceiverMgr/ Distance	Yes	0 to 100.000	nmi
Noise estimate	ProcessingMgr/ <ChannelID>/ ChannelProcessingCommon/ NoiseEstimate	Yes	0 to -200	dB

Related topics

[Parameter management, page 503](#)

[About parameters, page 519](#)

Asynchronous parameters

Description	Parameter name	R/O	Range	Unit
Vessel speed	OwnShip/ Speed	No	0 to 100	m/s
Vessel latitude	OwnShip/ Latitude	No	-90 to 90	deg
Vessel longitude	OwnShip/ Longitude	No	-180 to 180	deg
Vessel heave	OwnShip/ Heave	No	-100 to 100	m
Vessel roll	OwnShip/ Roll	No	-90 to 90	deg
Vessel pitch	OwnShip/ Pitch	No	-90 to 90	deg
Vessel distance	OwnShip/ VesselDistance	No	0 to 100.000	nmi
Environment temperature	OwnShip/ EnvironmentData/ Temperature	No	-5 to 50	deg
Environment salinity	OwnShip/ EnvironmentData/ Salinity	No	0 to 0,01	-
Environment sound velocity	OwnShip/ EnvironmentData/ SoundVelocity	No	1400 to 1700	m/s

Related topics

[Parameter management, page 503](#)

[About parameters, page 519](#)

Operation mode parameters

Description	Parameter name	R/O	Range	Unit
Ping start/stop	OperationControl/ OperationMode	No	Last bit: 0 = Stop, 1 = Start	
Ping rate mode	AcousticDeviceSynchroniser/ SyncMode	No	1 = Interval, 2 = Maximum, 32 = Single step	
Ping interval	AcousticDeviceSynchroniser/ Interval	No	Larger than 10	msec
Save raw data on/off	AcousticDeviceSynchroniser/ SaveRawData	No	0 = Off, 1 = On	

Related topics

[Parameter management, page 503](#)

[About parameters, page 519](#)

Datagram formats

Topics

[About NMEA and standard datagram formats, page 524](#)

[NMEA datagram formats, page 527](#)

[Proprietary datagram formats, page 534](#)

[Third party datagram formats, page 541](#)

About NMEA and standard datagram formats

The majority of the datagrams used by the EK80 are defined by the National Marine Electronics Association (NMEA).

Topics

[About the NMEA datagram formats, page 524](#)

[National Marine Electronics Association \(NMEA\), page 525](#)

[NMEA sentence structure, page 525](#)

[Standard NMEA 0183 communication parameters, page 526](#)

About the NMEA datagram formats

The EK80 can send and receive information to and from several different peripherals. All transmissions take place as **datagrams** with data sentences. Each datagram has a defined format and length.

The NMEA 0183 standard is the most common protocol used to receive and transmit data to and from peripheral sensors. A parametric sentence structure is used for all NMEA data.

The sentence start with a "\$" delimiter, and represent the majority of approved sentences defined by the standard. This sentence structure, with delimited and defined data files, is the preferred method for conveying information.

For more information about the NMEA standard, the format and the data sentences, refer to their official publications. Their document *NMEA 1083 - Standard for interfacing marine electronic devices* explains the formats in detail. The document can be obtained from NMEA.

Note

Two phrases are in general use to describe basic transfer unit associated with a packet-switched network; "telegram" and "datagram". In this publication, we use the phrase "datagram".

National Marine Electronics Association (NMEA)

The National Marine Electronics Association (NMEA) has defined communication standards for maritime electronic equipment, and the EK80 Scientific wide band echo sounder supports these standards for communication with external sensors and peripheral systems.

The most common standard is the NMEA 0183. The National Marine Electronics Association describes it as follows:

The NMEA 0183 Interface Standard defines electrical signal requirements, data transmission protocol and time, and specific sentence formats for a 4800 baud serial data bus. Each bus may have only one talker but many listeners.

National Marine Electronics Association

For more information about the National Marine Electronics Association and the NMEA 0183 standard, refer to the organization's web site at:

- <http://www.nmea.org>

NMEA sentence structure

A defines sentence structure is defined by NMEA to establish the communication between two units. Most other datagram formats are designed using the same, or a similar, structure.

The following provides a summary explanation of the approved parametric sentence structure.

```
$aacc,c-c*hh<CR><LF>
```

1 "\$"

This character (Hex: 24) is used to identify the start of the sentence.

2 "aacc"

This is the address field. The first two characters (aa) identifies the *talker ID*, while the last three characters are the *sentence formatter* mnemonic code identifying the data type and the string format of the successive fields.

3 ","

The comma (Hex: 2C) is used as *field delimiter*. This character starts each field except the address and checksum fields. If it is followed by a null field, it is all that remains to indicate no data in the field.

4 "c-c"

This is the *data sentence block*. This is a series of data fields containing all the data to be transmitted. The data field sentence is fixed and identified by the sentence formatter in the address field. Data fields may be of variable lengths, and they are preceded by the field delimiter.

5 "*"

This character (Hex: 2A) is the *checksum delimiter*. This delimiter follows the last field of the sentence, and indicates that the following two alphanumerical characters contain the checksum.

6 "hh"

This is the *checksum*.

7 <CR><LF>

The carriage return and line feed characters terminates the sentence.

Note

In some proprietary telegrams received from other Kongsberg Maritime equipment, the \$ character is replaced by the @ character. The checksum field may then not be in use.

Standard NMEA 0183 communication parameters

The EK80 uses both NMEA and proprietary datagram formats to communicate with peripheral systems and sensors. The majority of the datagrams used by the EK80 are defined by the National Marine Electronics Association (NMEA). NMEA defines a fixed set of transmission parameters.

The communication parameters defined for **NMEA 0183** are:

- **Baud rate:** 4800 bits per second
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** One

Some instruments may offer other parameters and/or choices. You must always check the relevant documentation provided by the manufacturer.

NMEA datagram formats

Topics

[NMEA DBK datagram, page 527](#)

[NMEA DBS datagram, page 528](#)

[NMEA DBT datagram, page 528](#)

[NMEA DPT datagram, page 529](#)

[NMEA GGA datagram, page 530](#)

[NMEA GLL datagram, page 531](#)

[NMEA RMC datagram, page 532](#)

[NMEA VLW datagram, page 533](#)

NMEA DBK datagram

The NMEA DBK datagram contains depth in feet, meters and fathoms. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram.

Format

```
$--DBK,x.x,f,y.y,M,z.z,F*hh
```

Description

All depths are measured from below the keel.

- 1 **\$--**: talker identifier
- 2 **DBK**: datagram identifier
- 3 **x.x,f**: depth in feet
- 4 **y.y,M**: depth in meters
- 5 **z.z,F**: depth in fathoms
- 6 ***hh**: checksum

Tip

If you need the depth below the surface, use the NMEA DBS datagram.

NMEA DBS datagram

The NMEA DBS datagram provides the current depth from the surface. The datagram is no longer recommended for use in new designs. It is frequently replaced by the NMEA DPT datagram.

Format

```
$--DBS,x.x,f,y.y,M,z.z,F*hh<CR><LF>
```

Description

All depths are measured from below the sea surface.

- 1 **\$--**: talker identifier
- 2 **DBS**: datagram identifier
- 3 **x.x,f**: depth in feet
- 4 **y.y,M**: depth in meters
- 5 **z.z,F**: depth in fathoms
- 6 ***hh**: checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram.

Related topics

[Depth Output page, page 356](#)

NMEA DBT datagram

The NMEA DBT datagram provides the current depth under the transducer. In dew designs, this datagram is frequently used to replace the DBK and DBS datagrams.

Format

```
$--DBT,x.x,f,y.y,M,z.z,F*hh<CR><LF>
```

Description

All depths are measured from below the transducer face.

- 1 **\$--**: talker identifier
- 2 **DBT**: datagram identifier
- 3 **x.x,f**: depth in feet

- 4 **y.y,M**: depth in meters
- 5 **z.z,F**: depth in fathoms
- 6 ***hh**: checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram.

Related topics

[Depth Output page, page 356](#)

NMEA DPT datagram

The NMEA DPT datagram provides the water depth relative to the transducer, and the offset of the measuring transducer.

Format

```
$--DPT,x.x,y.y,z.z*hh<CR><LF>
```

Description

This description is not complete. For additional details, refer to the NMEA standard.

- 1 **\$--**: talker identifier
- 2 **DPT**: datagram identifier
- 3 **x.x**: water depth, in meters, relative to the transducer
- 4 **y.y**: offset, in meters, from the transducer
Positive offset numbers provide the distance from the transducer to the water line. Negative offset numbers provide the distance from the transducer to the part of the keel of interest.
- 5 **z.z**: maximum range scale in use
- 6 ***hh**: checksum

Tip

If you need the depth below the keel, use the NMEA DBK datagram.

If you need the depth below the transducer, use the NMEA DBT datagram.

If you need the depth below the sea surface, use the NMEA DBS datagram.

Related topics[Depth Output page, page 356](#)**NMEA GGA datagram**

The NMEA GGA datagram transfers the time, position and fix related data from a global positioning system (GPS).

Format

```
$--GGA,hhmmss.ss,llll.ll,a,yyyy.yy,a,x,zz,d.d,a.a,M,g.g,M,r.r,cccc*hh
```

Description

- 1 **\$--**: talker identifier
- 2 **GGA**: datagram identifier
- 3 **hhmmss.ss**: coordinated universal time (UTC) of current position
- 4 **lll.ll**: latitude North/South
The position is given in degrees, minutes and hundredths.
- 5 **a**: North/South direction of latitude
N: North
S: South
- 6 **yyyy.yy**: longitude East/West
The position is given in degrees, minutes and hundredths.
- 7 **a**: West/East direction of longitude
W: West
E: East
- 8 **x**: Global positioning system (GPS) quality indicator
Refer to the NMEA standard for further details.
- 9 **zz**: number of satellites in use, 00 to 12, may be different from the number in view
- 10 **d.d**: horizontal dilution of precision
- 11 **a.a,M**: altitude related to mean sea level (geoid) in meters
- 12 **g.g,M**: geoidal separation in meters
- 13 **r.r**: age of differential global positioning system (GPS) data
- 14 **cccc**: differential reference station identification, 0000 to 1023
- 15 ***hh**: checksum

Related topics[Position page, page 400](#)**NMEA GLL datagram**

The NMEA GLL datagram transfers the latitude and longitude of vessel position, the time of the position fix and the current status from a global positioning system (GPS).

Format

```
$--GLL,l111.l1,a,yyyy.yy,a,hmmss.ss,A,a*hh<CR><LF>
```

Description

- 1 **\$--**: talker identifier
- 2 **GLL**: datagram identifier
- 3 **lll.ll**: latitude North/South
The position is given in degrees, minutes and hundredths.
- 4 **a**: North/South direction of latitude
N: North
S: South
- 5 **yyyy.yy**: longitude East/West
The position is given in degrees, minutes and hundredths.
- 6 **a**: West/East direction of longitude
W: West
E: East
- 7 **hmmss.ss**: coordinated universal time (UTC) of current position
- 8 **A**: status
A: data is valid
V: data is not valid
- 9 **a**: mode indicator
- 10 ***hh**: checksum

Related topics[Position page, page 400](#)

NMEA RMC datagram

The NMEA RMC datagram transfers the time, date, position, course and speed data from a global navigation satellite system (GNSS) receiver.

Format

```
$--RMC,hhmmss.ss,A,llll.ll,a,yyyy.yy,a,x.x,z.z,ddmmyy,r.r,a,a*hh
```

Description

- 1 **\$--**: talker identifier
- 2 **RMC**: datagram identifier
- 3 **hhmmss.ss**: coordinated universal time (UTC) of current position
- 4 **A**: status
 A: data is valid
 V: data is not valid
- 5 **lll.ll**: latitude North/South
 The position is given in degrees, minutes and hundredths.
- 6 **a**: North/South direction of latitude
 N: North
 S: South
- 7 **yyyy.yy**: longitude East/West
 The position is given in degrees, minutes and hundredths.
- 8 **a**: West/East direction of longitude
 W: West
 E: East
- 9 **x.x**: speed over ground in knots
- 10 **z.z**: course over ground, degrees true
- 11 **ddmmyy**: date
- 12 **r.r**: magnetic variation, degrees East/West
- 13 **a**: bearing
 E: East
 W: West
- 14 **a**: mode indicator
- 15 ***hh**: checksum

Related topics[Position page, page 400](#)[Speed page, page 402](#)[Heading page, page 405](#)**NMEA VLW datagram**

The NMEA VLW datagram contains the travelled distance of the vessel. Two values are provided; relative to the water and over the ground.

Format

```
$--VLW,x.x,N,y.y,N,z.z,N,g.g,N*hh<CR><LF>
```

Description

- 1 \$--: talker identifier
- 2 VLW: datagram identifier
- 3 x.x,N: total cumulative water distance, nautical miles
- 4 y.y,N: water distance since reset, nautical miles
- 5 z.z,N: total cumulative ground distance, nautical miles
- 6 g.g,N: ground distance since reset, nautical miles
- 7 *hh: checksum

Related topics[Distance page, page 403](#)

Proprietary datagram formats

Topics

[Simrad ATS datagram, page 534](#)

[Simrad EK500 Depth datagram, page 534](#)

[Simrad Sounder/TSS1 datagram, page 536](#)

[Kongsberg EM Attitude 1000 datagram, page 537](#)

[Kongsberg EM Attitude 3000 datagram, page 539](#)

Simrad ATS datagram

Simrad ATS is a proprietary datagram format created by Kongsberg Maritime. It allows you to import annotations from external devices.

Format

```
$??ATS,tttt<CR><LF>
```

Description

- 1 **??**: talker identifier
- 2 **ATS**: datagram identifier
- 3 **tttt**: free text string

Related topics

[Annotations page, page 407](#)

Simrad EK500 Depth datagram

Simrad EK500 Depth is a proprietary datagram format created by Kongsberg Maritime. It was originally defined for the Simrad EK500 scientific echo sounder. It provides the current depth from three channels, as well as the bottom surface backscattering strength and the athwartships bottom slope. This telegram has been designed for output on either a serial line or a local area network Ethernet connection.

Serial line format

```
D#,hhmssstt,x.x,y.y,t,s.s<CR><LF>
```

Serial line description

- 1 **D#:** channel identifier
 - **D1:** Channel 1
 - **D2:** Channel 2
 - **D3:** Channel 3
- 2 **hhmmsstt:** current time; hour, minute, second and hundredth of second
- 3 **x.x:** detected bottom depth in meters
- 4 **y.y:** bottom surface backscattering strength in dB
- 5 **t:** transducer number
- 6 **s,s:** athwartships bottom slope in degrees

Ethernet format

The Ethernet line output is specified using a “C” programming language structure. Note that this format does not include carriage return and line feed characters at the end of the telegram.

```
struct Depth {
    char Header[2];
    char Separator1[1];
    char Time[8];
    char Separator1[2];
    float Depth[4];
    float Ss[4];
    long TransducerNumber[4];
    float AthwartShips;
};
```

Ethernet description

- 1 **Header#**
 - **D1:** Channel 1
 - **D2:** Channel 2
 - **D3:** Channel 3
- 2 **Seperator:** “,”
- 3 **Time:** current time; hour, minute, second and hundredth of second
- 4 **Depth:** detected bottom depth in meters
- 5 **Ss:** bottom surface backscattering strength in dB
- 6 **TransducerNumber:** transducer number
- 7 **AthwartShips:** athwartships bottom slope in degrees

Related topics

[Depth Output page, page 356](#)

Simrad Sounder/TSS1 datagram

Simrad Sounder/TSS1 is a proprietary datagram format created by Kongsberg Maritime for heave, roll and pitch compensation. When you select this protocol, the number of sensor variables is fixed, and there is no token associated with it.

Format

```
:aabbbb shhhhx srrrr spppp<CR><LF>
```

Description

The format is based on ASCII characters, the datagram has a fixed length, and it is terminated with a carriage return and line feed. Baud rate and output rate may be adjusted to fit your needs.

The definition of the attitude angles in this format is different from the *Euler* angles definition used elsewhere. The difference appears in the roll angle, where:

$$\text{Roll}_{\text{echo sounder}} = \arcsin [\sin(\text{Roll}_{\text{Euler}}) \times \cos(\text{Pitch}_{\text{Euler}})]$$

1 **aa** : sway acceleration

This is a dual characters hex number, value provided as 0.03835 m/ss units.

2 **bbbb**: heave acceleration

This is a four characters hex number, value provided as 0.000625 m/ss units.

3 **s**: this is a single character.

If the value is positive, a "space" character is provided.

If the value is negative, a "-" character is provided.

4 **hhhh**: heave position

This is a four characters decimal number with value in centimeters, positive up.

5 **x**: status character

- **U**: Unaided mode and stable data. The sensor operates without external input data.
- **u**: Unaided mode but unstable data. The sensor is without external input data, but the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on restarted. The alignment period from a power recycle is normally approximately five minutes.
- **G**: Speed aided mode and stable data. The sensor operates with external input of speed data.
- **g**: Speed aided mode but unstable data. The sensor operates with external input of speed data, but the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on restarted, or a failure in the speed data input.

- **H**: Heading aided mode and stable data. The sensor operates with external input of heading data.
 - **h**: Heading aided mode but unstable data. The sensor operates with external input of heading data, but the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on restarted, or a failure in the heading data input.
 - **F**: Full aided mode and stable data. The sensor operates with external input of both speed and heading data.
 - **f**: Full aided mode but unstable data. The sensor operates with external input of heading and speed data, but the data from the sensor is unstable. A probable cause for this is the lack of alignment after the sensor has been switched on restarted, or a failure in the heading and/or speed data input.
- 6 **s**: this is a single character.
If the value is positive, a "space" character is provided.
If the value is negative, a "-" character is provided.
- 7 **rrrr**: roll angle
This is a four characters decimal number value in hundreds of a degree.
- 8 **s**: this is a single character.
If the value is positive, a "space" character is provided.
If the value is negative, a "-" character is provided.
- 9 **pppp**: pitch angle
This is a four characters decimal number value in hundreds of a degree.

Kongsberg EM Attitude 1000 datagram

Kongsberg EM Attitude 1000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch heave and heading. The datagram contains a 10-bytes long message. In many new designs, this datagram format has been replaced with Kongsberg EM Attitude 3000

Format

Data description	Example	Format	Valid range
Sync byte 1 / Sensor status [1]	90h to Afh = sensor status	1U	00h, 90h to Afh
Sync byte 2	Always 90h	1U	144
Roll LSB [2]		1U	
Roll MSB [2]		1U	
Pitch LSB [2]		1U	
Pitch MSB [2]		1U	
Heave LSB [2]		1U	
Heave MSB [2]		1U	

Data description	Example	Format	Valid range
Heading LSB [2]		1U	
Heading MSB [2]		1U	

Description

LSB = least significant byte

MSB = most significant byte.

1 **Sync byte 1 / Sensor status**

2 **All data are in 2's complement binary.**

Resolution is 0.01 degrees for roll, pitch and heading, and 1 cm for heave.

- Roll is positive with port side up with valid range ± 179.99 degrees.
- Pitch is positive with bow up with valid range ± 179.99 degrees.
- Heave is positive up with valid range ± 9.99 m.
- Heading is positive clockwise with valid range 0 to 359.99 degrees.

If a value is outside the valid range, it is assumed to be non-valid, and rejected.

Note

Heave is logged as positive downwards (the sign is changed) including roll and pitch induced lever arm translation to the transmit transducer.

You can define how roll is assumed to be measured, either with respect to the horizontal plane (the *Hippy 120* or *TSS* convention), or to the plane tilted by the given pitch angle (i.e. as a rotation angle around the pitch tilted forward pointing x-axis).

The latter convention (called *Tate-Bryant* in the POS/MV documentation) is used inside the system in all data displays and in the logged data. A transformation is applied if the roll is given with respect to the horizontal.

Note

This format was originally designed for use with the early multibeam echo sounders manufactured by Kongsberg Maritime. In the original version of the format (Kongsberg EM Attitude 1000), the first synchronisation byte was always assumed to be zero. The sensor manufacturers were then requested to include sensor status in the format using the first synchronisation byte for this purpose. With this additional information added, the datagram format is known as Kongsberg EM Attitude 3000.

Kongsberg EM Attitude 3000 datagram

Kongsberg EM Attitude 3000 is a proprietary datagram format created by Kongsberg Maritime for use with digital motion sensors. It holds roll, pitch heave and heading. The datagram contains a 10-bytes long message.

Format

Data description	Example	Format	Valid range
Sync byte 1 / Sensor status [1]	90h to Afh = sensor status	1U	00h, 90h to Afh
Sync byte 2	Always 90h	1U	144
Roll LSB [2]		1U	
Roll MSB [2]		1U	
Pitch LSB [2]		1U	
Pitch MSB [2]		1U	
Heave LSB [2]		1U	
Heave MSB [2]		1U	
Heading LSB [2]		1U	
Heading MSB [2]		1U	

Description

LSB = least significant byte

MSB = most significant byte.

1 Sync byte 1 / Sensor status

- **00h**: This value is sync byte 1.
- **90h**: This value indicates valid measurements with full accuracy.
- Any value from **91h** to **99h** indicates valid data with reduced accuracy (decreasing accuracy with increasing number).
- Any value from **9Ah** to **9Fh** indicates non-valid data but normal operation (for example configuration or calibration mode).
- Any value from **A0h** to **AFh** indicates a sensor error status.

2 All data are in 2's complement binary.

Resolution is 0.01 degrees for roll, pitch and heading, and 1 cm for heave.

- Roll is positive with port side up with valid range ± 179.99 degrees.
- Pitch is positive with bow up with valid range ± 179.99 degrees.
- Heave is positive up with valid range ± 9.99 m.
- Heading is positive clockwise with valid range 0 to 359.99 degrees.

If a value is outside the valid range, it is assumed to be non-valid, and rejected.

Note

Heave is logged as positive downwards (the sign is changed) including roll and pitch induced lever arm translation to the transmit transducer.

You can define how roll is assumed to be measured, either with respect to the horizontal plane (the *Hippy 120* or *TSS* convention), or to the plane tilted by the given pitch angle (i.e. as a rotation angle around the pitch tilted forward pointing x-axis).

The latter convention (called *Tate-Bryant* in the POS/MV documentation) is used inside the system in all data displays and in the logged data. A transformation is applied if the roll is given with respect to the horizontal.

Note

This format was originally designed for use with the early multibeam echo sounders manufactured by Kongsberg Maritime. In the original version of the format (Kongsberg EM Attitude 1000), the first synchronisation byte was always assumed to be zero. The sensor manufacturers were then requested to include sensor status in the format using the first synchronisation byte for this purpose.

Third party datagram formats

Topics

[Atlas Depth datagram, page 541](#)

Atlas Depth datagram

Atlas Depth is a proprietary datagram format created by Atlas Elektronik (<http://http://www.atlas-elektronik.com/>) to provide the current depth from two channels.

Format

```
Dyxxxxxx.xxm
```

Description

- 1 **Dy**: channel number
 - **DA**: channel number 1
 - **DB**: channel number 2
- 2 **xxxxx.xx**: depth (in meters)
- 3 **m**: meters

Related topics

[Depth Output page, page 356](#)

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