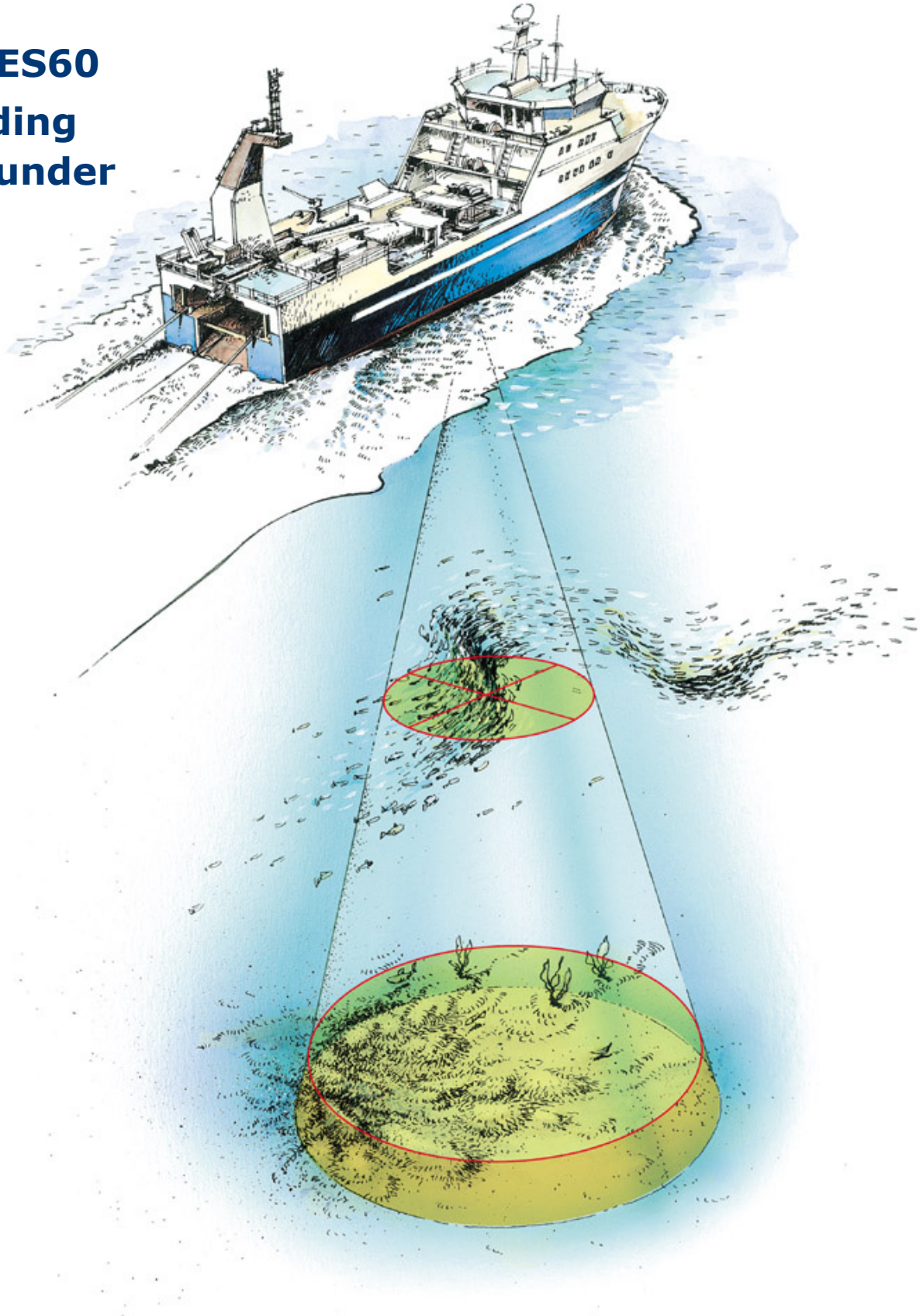
Reference manual

Simrad ES60
Fish finding echo sounder



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Simrad ES60
Fish finding echo sounder

Reference manual

Document revisions

Rev	Date	Written by	Checked by	Approved by
Rev.H	25.09.06	RBr	AJ	AJ
	Removed information about installation.			

About this document

ISBN 82-8066-028-3

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Chapters

1 System description

This chapter presents a general description of the echo sounder system. Refer to page 1.

2 Display views

This chapter explains the layout of the echo sounder display presentation. Refer to page 12.

3 Getting started

This chapter provides an operational example to get you started with the operation. Refer to page 26.

4 Operational procedures

This chapter provides specific procedures for common tasks. Refer to page 37.

5 Reference guide

This chapter explains the menus and dialogue boxes in detail. Refer to page 57.

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SYSTEM DESCRIPTION

Introduction

This chapter provides a brief introduction to the Simrad ES60 fishery echo sounder system.

Related topics

→ *Overview, page 2*
→ *ES60 System drawing, page 3*
→ *Wave propagation, page 4*
→ *Bottom echo, page 6*
→ *Split-beam operation, page 8*
→ *Observation range, page 10*

Important notice

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Echosounder software version

This manual complies to echo sounder software version 1.5.0.75.

System overview

Key facts

The Simrad ES60 echo sounders is designed for the professional fishery community implementing the latest innovations.

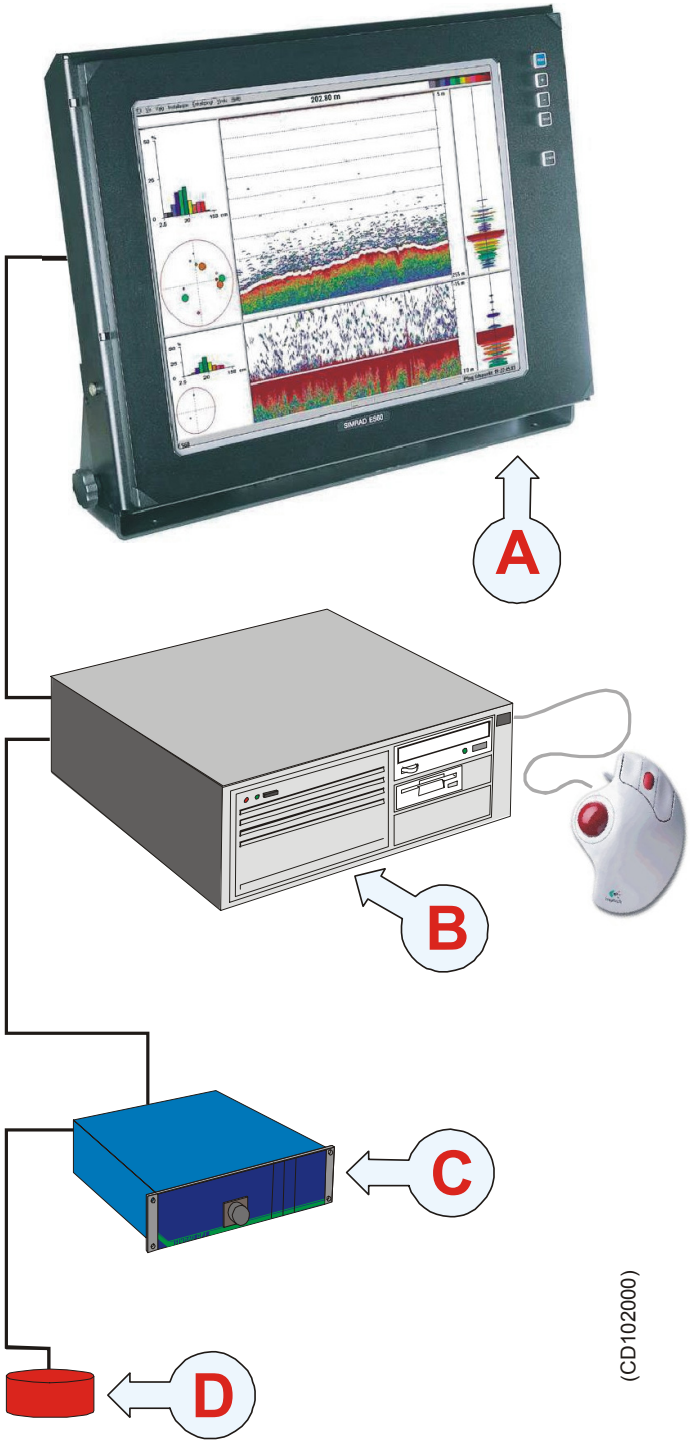
- The ES60 system is flexible and easy to configure due to the modular design.
- Echo sounders ranging from relatively low-cost single beam to large multi-frequency systems containing several split-beam channels can be realised.
- Menus and dialogue boxes are operated by a standard mouse or a roller ball.
- Large colour liquid crystal displays (LCD) are used. A standard computer mouse may be used.
- The ES60 uses the Microsoft Windows® display interface. Operation is to a large extent self-explanatory. Getting started is easy if you are familiar with standard Microsoft Windows® programs.
- A store/replay function reduces the need for echogram printout on paper. The unprocessed transducer signal is recorded on the internal harddisk. During replay, this signal is injected into the ES60 processing software as if it arrived directly from the transceiver.

Main units

The standard version of the ES60 echo sounder consists of the following units:

- a display unit (several sizes are available)
- a Processing Unit (personal computer)
- a General Purpose Transceiver (different types are available)
- a transducer (a wide range of frequencies are available)

Up to four frequency channels can be installed in a single system. High-power single-beam and split-beam transducers are available at operating frequencies ranging from 12 to 200 kHz.



System diagram:

(A) = LCD monitor

(B) = Processor Unit

(C) = General Purpose Transceiver (GPT)

(D) = Transducer

Wave propagation

The velocity of sound wave propagation in the sea varies slightly with temperature, salinity and pressure. The velocity varies between 1440 and 1520 m/s in shallow sea water, while a velocity around 1480 m/s can be expected at 1000 m depth. In shallow fresh water the velocity is approximately 1430 m/s.

A good average value to be used in the **Environment** dialogue box is 1470 m/s.

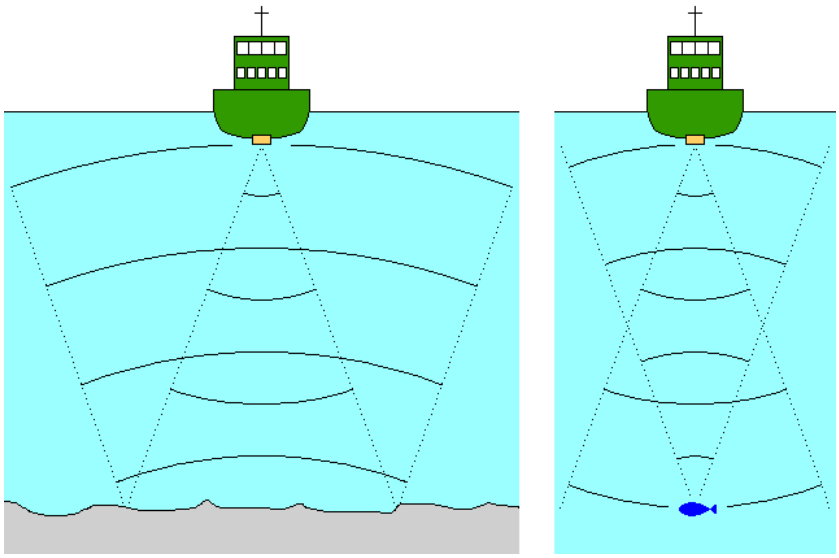


Figure 1 The wave propagation principles

The ES60 transmits high energy sound wave pulses into the sea. A flat bottom reflects the transmitted wave as if it were a mirror. The propagating energy is spread over a larger and larger area as it travels down to the bottom and up again. The energy is spread over a four times larger area every time the travel distance doubles.

A large school of fish reflects sound waves similarly. This type of spreading is referred to as **square-law** or **20 log TVG** (Time Varying Gain) spreading.

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** spreading.

In the echo sounder's **Echogram** dialogue box **20 log TVG** spreading is called **School Gain** and **Bottom Gain**, while **40 log TVG** spreading is called **Fish 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 echo sounder 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).

Related topics

→ *Environment, page 89*

→ *Echogram, page 85*

Bottom echo

A hard flat bottom reflects the transmitted signal as if it were 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.

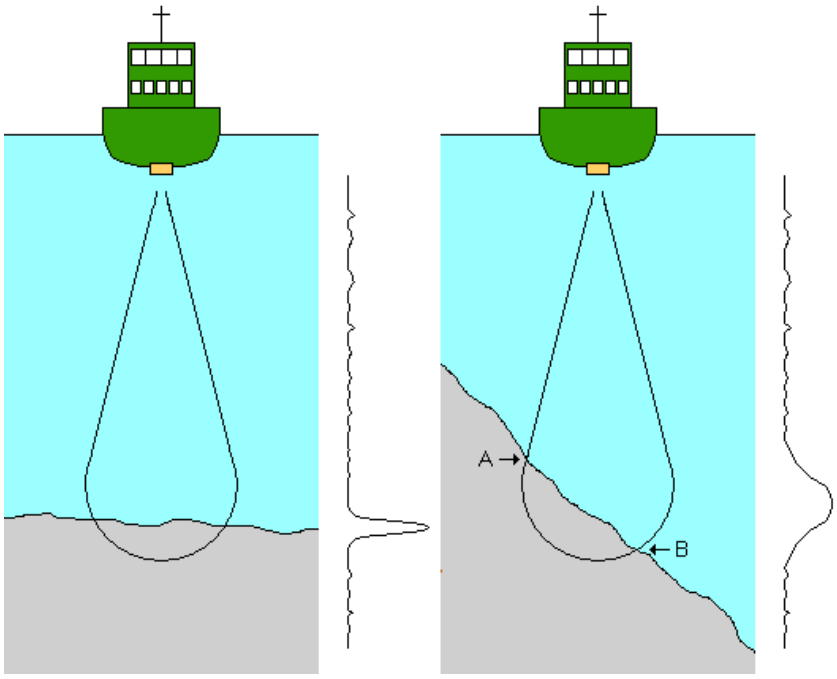


Figure 2
Bottom echo

The received echo signal is basically an attenuated copy of the short transmit pulse. The echo signal from a sloped bottom is characterised 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 on the echo sounder display.

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 output. 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 ES60 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 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.

Split-beam operation

The ES60 uses the split-beam technique for assessment of the size distribution of individual fish. A split-beam transducer is electrically divided into four quadrants. All four quadrants are excited in parallel during transmission. However, the received signal from each quadrant is separately amplified in a four-channel matched receiver allowing the direction of arrival of an echo to be determined.

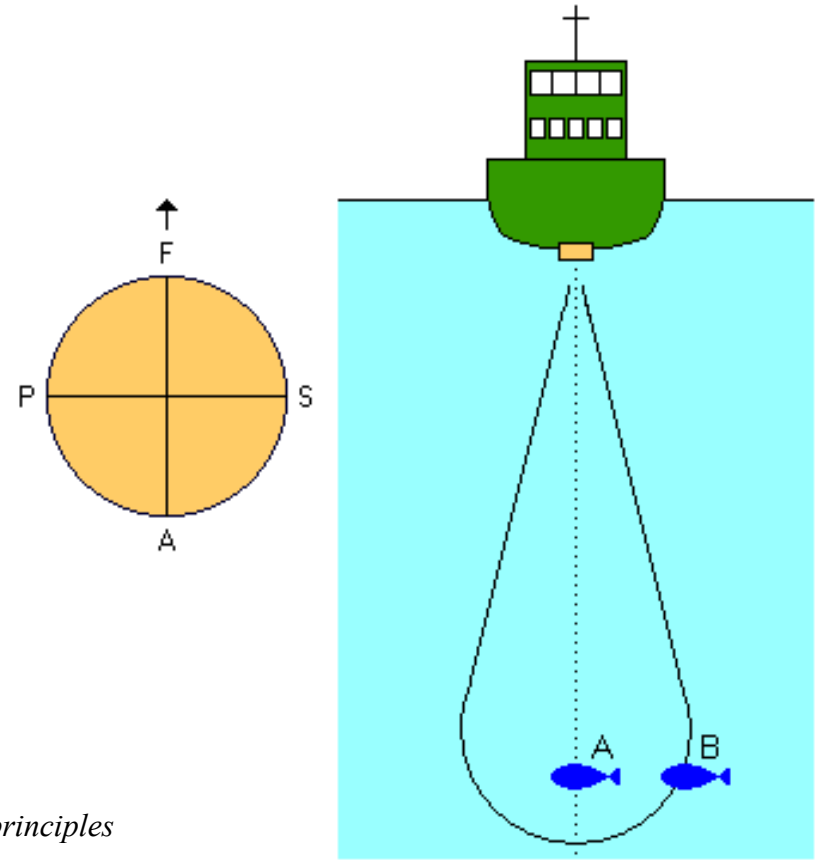


Figure 3 Split-beam principles

An acoustic wave front propagating towards the transducer arrives at the four quadrants at different times causing the phase angle of the electrical output signal from the quadrants to differ. The fore-and-aft angle is determined from the electrical phase difference between the fore and the aft transducer halves, and the athwartships angle is determined from the starboard and port signals.

Fish A is positioned along the transducer axis where the transducer has its maximum sensitivity, while **Fish B** is positioned towards the edge of the beam where the sensitivity is lower. Evidently, the echo signal from **Fish A** will be stronger than the signal from **Fish B** even though they are of the same size and at the same depth. Hence, determining fish size from

the received echo strength alone will not be too successful. A split-beam echo sounder measures the position of the fish within the beam. The sounder corrects for the difference in transducer sensitivity and computes the true size of the fish.

The split-beam measurement technique only works for echoes originating from one single fish since the electrical phase will be random if echoes from multiple individuals at different positions in the beam are received simultaneously.

Consequently, measurement of fish size inside a school of fish tends to be unreliable.

Observation range

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.

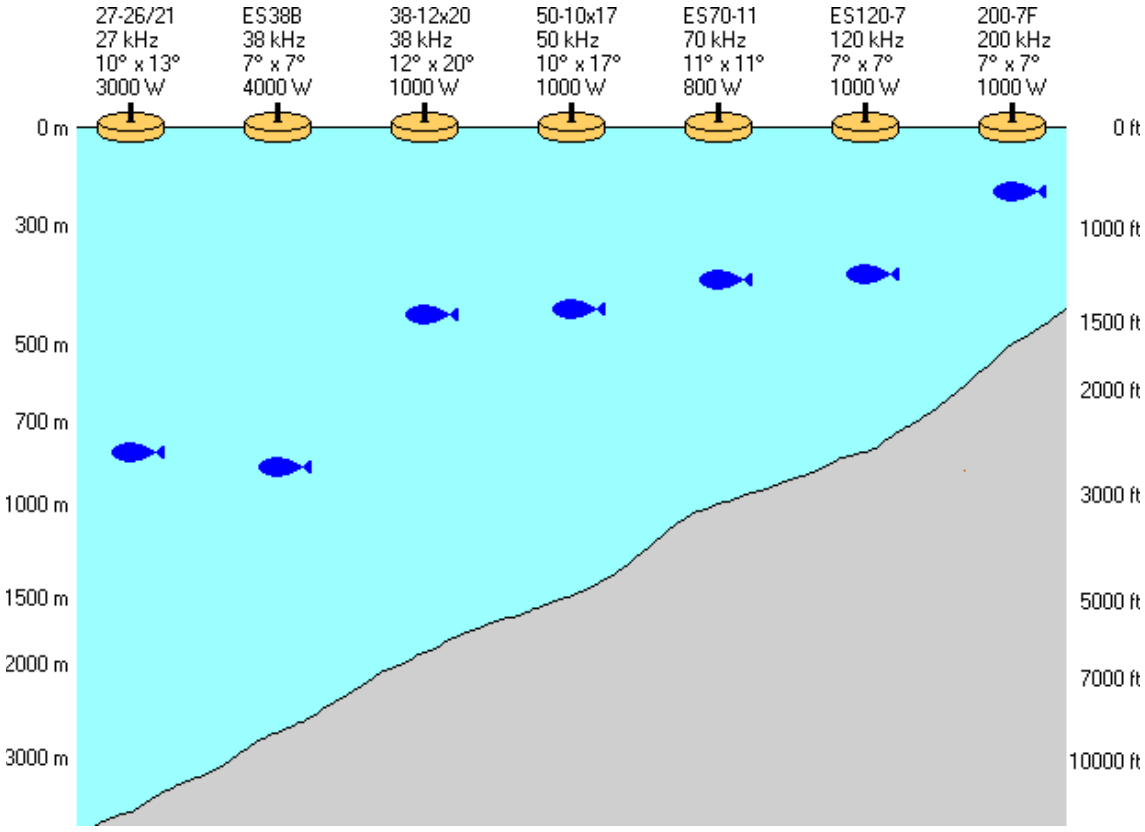


Figure 4 Observation range

Maximum detection depth

Transducer	Frequency, kHz	Pulse duration, ms	Band width, Hz	Transmit power, W	Range fish, m	Range bottom, m
12-16	12	16.40	193	2000	850	10000
ES 18	18	8.21	382	2000	1100	7000
27-26	27	8.18	387	3000	1100	4400
38/200D	38	4.09	766	1000	500	2100
38-9	38	4.09	766	1500	800	2600
38-7	38	4.09	766	2000	950	2800
50/200D	50	2.05	1493	1000	500	1500
50-7	50	2.05	1493	2000	700	1900
ES70-11	70	2.05	1526	800	450	1100

Transducer	Frequency, kHz	Pulse duration, ms	Band width, Hz	Transmit power, W	Range fish, m	Range bottom, m
120-25	120	1.02	3026	1000	390	800
ES120-7	120	1.02	3026	1000	440	850
50/200D	200	1.03	3088	1000	280	550
ES200-7	200	1.03	3088	1000	270	550

Typical observation ranges are shown in the figure. Using the **Simrad 27-26/21** transducer (27 kHz, 10x13 degrees, 3000 W) you can observe a 60 centimeter cod down to 800 meters, and bottom detection works down to 3800 meters. However, with the **Simrad 200-7F** transducer (200 kHz, 7x7 degrees, 1000 W) you can only observe that same cod down to 260 meters, and bottom detection becomes unreliable below 500 meters.

These range calculations assume a normal sea water salinity (3.5%) and temperature (+10 degC), an average bottom (surface backscattering strength = -20 dB) and a noise level typical for a moving vessel.

DISPLAY VIEWS

Introduction

This chapter provides a brief overview of the information displayed by the ES60, and how it is organised.

Related topics

→ *Display layout and main view, page 13*

→ *Moving boundary lines, page 14*

→ *Direct access to dialog boxes, page 15*

→ *Menu bar, page 16*

→ *Header view, page 17*

→ *Echo frames, page 18*

→ *Status bar, page 21*

→ *History and printer views, page 22*

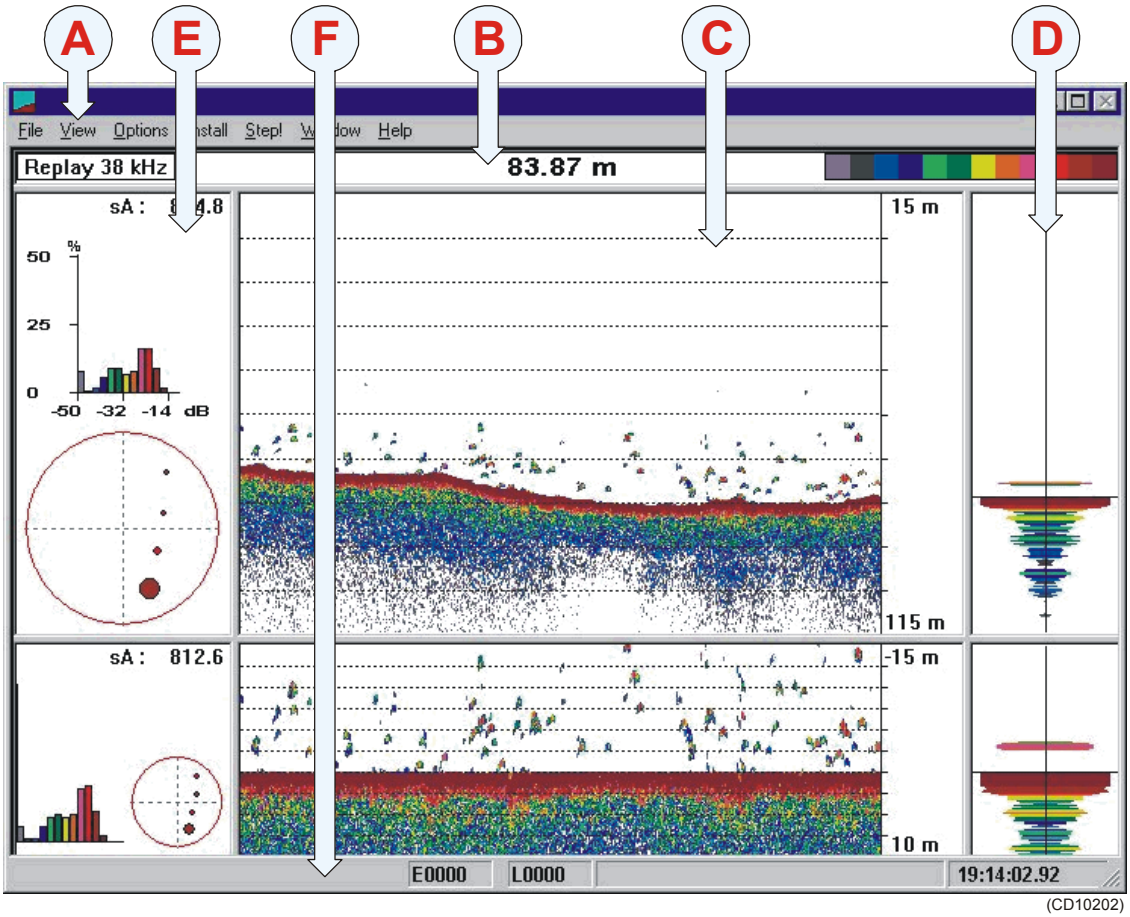
Display organisation

Main view

The ES60 display is organised as follows (from top):

- Menu bar
- For each transceiver channel:
  - Two echo frames
- Status bar

A single channel display is shown below as an example.



(A) Main menu
(B) Header view
(C) Echogram and range view
(D) Scope view
(E) Single echo view
(F) Status bar

Menu

The **Menu bar** contains the echo sounder's main menu. A single click on one of the menu names will provide a new drop-down menu where additional choices can be made.

Header

For each channel, the **Header** view contains the current operational mode and frequency, the current depth, and the colour scale.

Echo frames

The **Echo frame** takes up the largest part of the echo sounder window. Each **Echo frame** contains (from left) a **Single Echo** view, an **Echogram and Range** view and a **Scope** view.

The **Echo frame** view is are also described in more detail in the Getting started chapter.

Status bar

The **Status bar** presents the current event and line numbers, current time, and other information provided by the echo sounder.

Moving the boundary lines

You can modify the vertical size of the echograms by moving the horizontal boundary line between the two echograms.

To do this:

1 Position the cursor at the boundary line.

2 Press the left mouse button.

3 Drag the cursor up or down vertically while keeping the left mouse button pressed.

4 Release the left mouse button.

Using the same operation, you can modify other boundary lines on the display;

- The horizontal line between the upper **Echo frame** and the **Header** view
- The vertical line between the **Echogram and Range** view and the **Scope** view
- the vertical line between the **Echogram and Range** view and the **Single Echo** view.

Direct access to dialogue boxes

Several dialogue boxes are directly accessed from the various views on the display.

Position the cursor, and right-click on the...

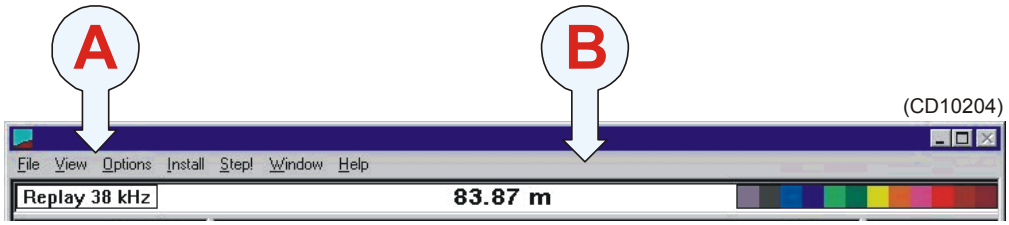
- **Mode and frequency** information in the **Header** view to open the **Transceiver Settings** dialogue box.
- **Depth** value in the **Header** view to open the **Bottom Detector** dialogue box.
- **Colour scale** in the **Header** view to open the **Colour Scale** dialogue box.
- **Range** field in the **Echogram and Range** view to open one of the **Range** dialogue boxes, depending of the current echogram type.
- **Echogram** field in the **Echogram and Range** view to open the **Echogram** dialogue box.
- **Single Echo** view to open the **Echo Trace** dialogue box.

Related topics

→ *Menu bar, page 16*
→ *Header view, page 17*
→ *Echo frames, page 18*
→ *Status bar, page 21*
→ *Getting started; Operation, page 30*
→ *Bottom Detector, page 78*
→ *Colour Scale, page 81*
→ *Echogram, page 85*
→ *Bottom Range, page 80*
→ *Surface Range, page 115*
→ *Transceiver settings, page 119*
→ *Echo Trace, page 84*

Menu bar

The ES60 **Menu bar** contains the **Main menu**.



(A) Main menu

(B) Menu bar

The main menu has the following options:

- File
- View
- Options
- Install
- Step!
- Help

To operate, click on the menu name and observe the drop-down menu. Select a new item on the drop-down menu by clicking on the command. Commands shown with light grey colour are unavailable in the present configuration or operational mode.

The menus are all explained in the Reference Guide.

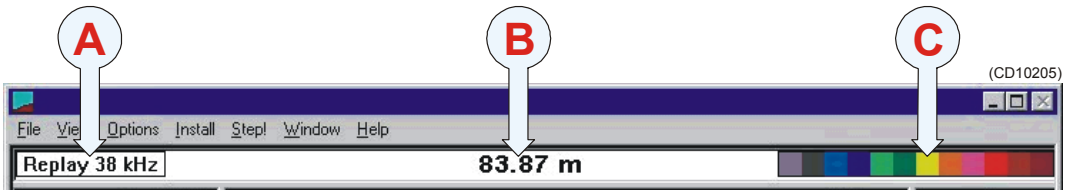
Related topics

→ *Main menu, page 58*

→ *Reference guide, page 57*

Header view

The ES60 **Header** view is shown directly above the two Echo frames. The top **Header** view is thus located just below the **Menu** bar. The **Header** view contains the following information.



(A) Transceiver settings: Current mode and frequency

(B) Bottom detection: Current depth

(C) Colour Scale

The **Header** view is a part of the channel. If more than one channel is displayed, the **Header** view is duplicated as well.

The **Header** view provides direct access to the following dialogue boxes:

- Right-click in the Transceiver settings field (on the **Mode** and **frequency** information) to open the **Transceiver Settings** dialogue box.
- Right-click in the Bottom detection field (on the **Depth** value) to open the **Bottom Detector** dialogue box.
- Right-click on the **Colour scale** to open the **Colour Scale** dialogue box.

Related topics

→ *Transceiver Settings, page 119*

→ *Bottom Detector, page 78*

→ *Colour Scale, page 81*

Echo frames

Overview

The ES60 **Echo frames** are the main information bearer on the echo sounder display. The **Echo frames** are usually presented in pairs with two echo frames for each channel.

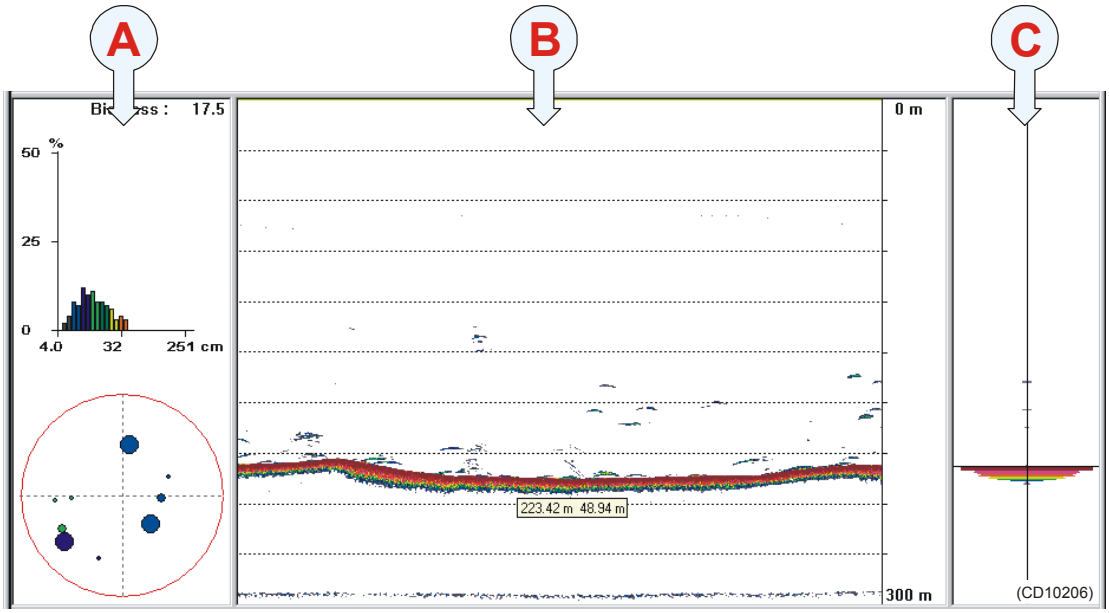
The **Echo frame** contains the following views:

(A) Single echo view

(B) Echogram and Range view

(C) Scope view

Note that the **Single Echo** view is only available in split-beam versions of the echo sounder.



Single Echo

The **Single Echo** view contains information on detection of single echoes. Two plots are visible in this view:

- The top plot shows a histogram of the fish size distribution for the single echoes detected in the echogram.
- The bottom plot shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles).
- The upper right corner of the view shows the **Biomass** value calculated from the total biomass of fish, plancton etc from the current echogram.

Note that the colours used to display this information are determined from the settings in the **Colour Scale**.

If you place the cursor in the coordinate system, a small yellow label will appear to give you a detailed readout of the target strength in dB at the cursor's position. This target strength indicates the fish length (in cm or inches) or fish weight (in kg).

Related topics

→ *Getting started, page 31.*
→ *Colour Scale, page 81.*

Echogram and Range

The **Echogram and Range** view consists of an **Echogram** field to the left and a **Range** field to the right. These are separated by the vertical range axis. The **Echogram** field contains information about the acoustical values, while the **Range** field is used for specifying the range used in the **Echogram** field. The settings in the **Colour Scale** is used to present the information.

In the echogram field, the presentation can be of different views. This can be selected in echogram dialogue bok as 1x, 3x, 5x, or all. Fore examle: If a 20 tranducer system; all selected, 20 echogram in the echogram filed.

When you place the cursor in the **Echogram** field, you can use the mouse wheel to modify the gain setting, and hence the display colour sensitivity. Each click of the wheel corresponds to a 1 dB change. The same gain setting is available from the **Colour Scale** dialogue box.

Whenever the cursor is located within the **Echogram** field, a small yellow label is visible. The label provides the following information:

- **Left:** Depth at the cursor position
- **Middle:** Diameter coverage from the transducer beam
- **Right:** Current gain setting

To change the range, you can also use the mouse wheel. Place the cursor inside the **Range** field to do this:

- In a surface related echogram you will modify the range, while for a bottom related echogram, you will change the start range.
- If you press the left mouse button while you use the mouse wheel, the surface echogram will change its start value, while the bottom related echogram will change its range.

Related topics

→ *Getting started, page 32*
→ *Colour Scale, page 81*

Scope

The **Scope** view is the rightmost view and shows a oscilloscope view of the last ping corresponding to the settings in the **Echogram** view.

This view draws a range of horizontal symmetrical colour lines. The distance from the vertical centre axis and the line colour reflects the received echo amplitude. A black horizontal line across the view indicates the current bottom view.

Channel:

Test presentation for passive or test mode

Passive:

Background Noise: yyy.y dBW

Receiver Amplitude: xxx.x dBW

Alongship angle: z.zz deg

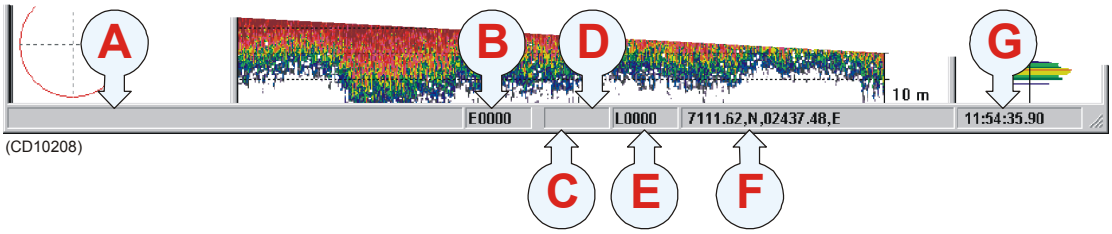
Athwarthship Angle: z.zz deg

The background noise shown is the median of 20 equidistance power samples in the total range of the current ping. The receiver and the two angles (alongship and athwarthship) are sampled at 100 m depth. During replay, you may find that this depth setting is not availbale because the depth is less than 100 m. The receiver amplitude is then set to a minimum (235 dBW), and the angles are set to zero.

Status bar

The ES60 **Status bar** is located at the bottom of the display. It contains the following information:

Note that the water temperature read-out will only be available if a sensor is connected to the echo sounder. Also, navigational information requires that the applicable position information is connected to the echo sounder.



(A) Information applicable for the current operation

(B) Event number

(C) Printer logo (when printer is active)

(D) Current temperature

(E) Storage line number

(F) Navigational information (latitude and longitude)

(G) Time

Related topics

→ *Status bar, page 66*

History and printer views

Overview

The echogram information provided on the display will differ slightly from the information provided on the printer and in the **History** files. This is because the annotation settings differ between the two media.

The annotations provided for display output are controlled by the **Annotations** dialogue box. When enabled in the **Prister and History** dialogue box, the annotations will also be sent to the printer and to the History files.

The **Printer and History** dialogue box also enables additional annotations to be printed.

The most important difference is that the annotations added to the echogram will only show in full on the printer and in the **History** dialogue box. To demonstrate this difference, refer to the two illustrations.

Related topics

→ *History, page 95*

→ *Annotations, page 73*

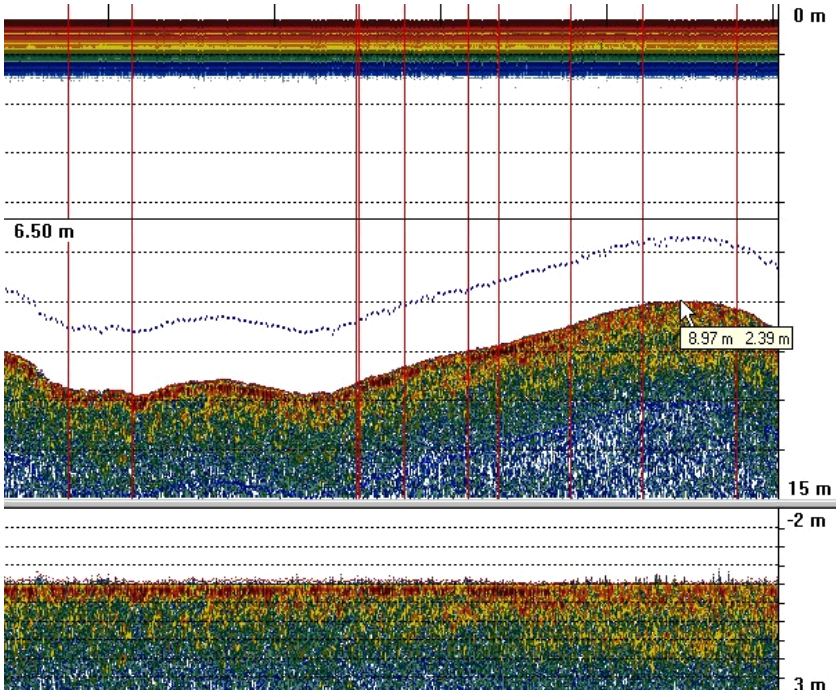
→ *Printer and History, page 105*

Display example

The first illustration shows an excerpt of the display view as it appears during normal operation when several annotations have been added.

The annotations are not displayed with all the information they contain, they are merely added as vertical red lines.

Figure 5 Display presentation



The next illustration shows how the **History** window presents the same echogram.

Printer example

A printout from the echo sounder is shown below.

From the top left corner, you can see the following annotations.

(1) A depth annotation. This information will automatically appear at regular intervals, and whenever you change the echo sounder's depth range.

(2) An external annotation with the text "This is an ATS annotation". This annotation has been imported on the serial line from the navigation system.

(3) Two annotations with navigational information. This information appears with regular intervals when enabled from the **Printer and History** dialogue box.

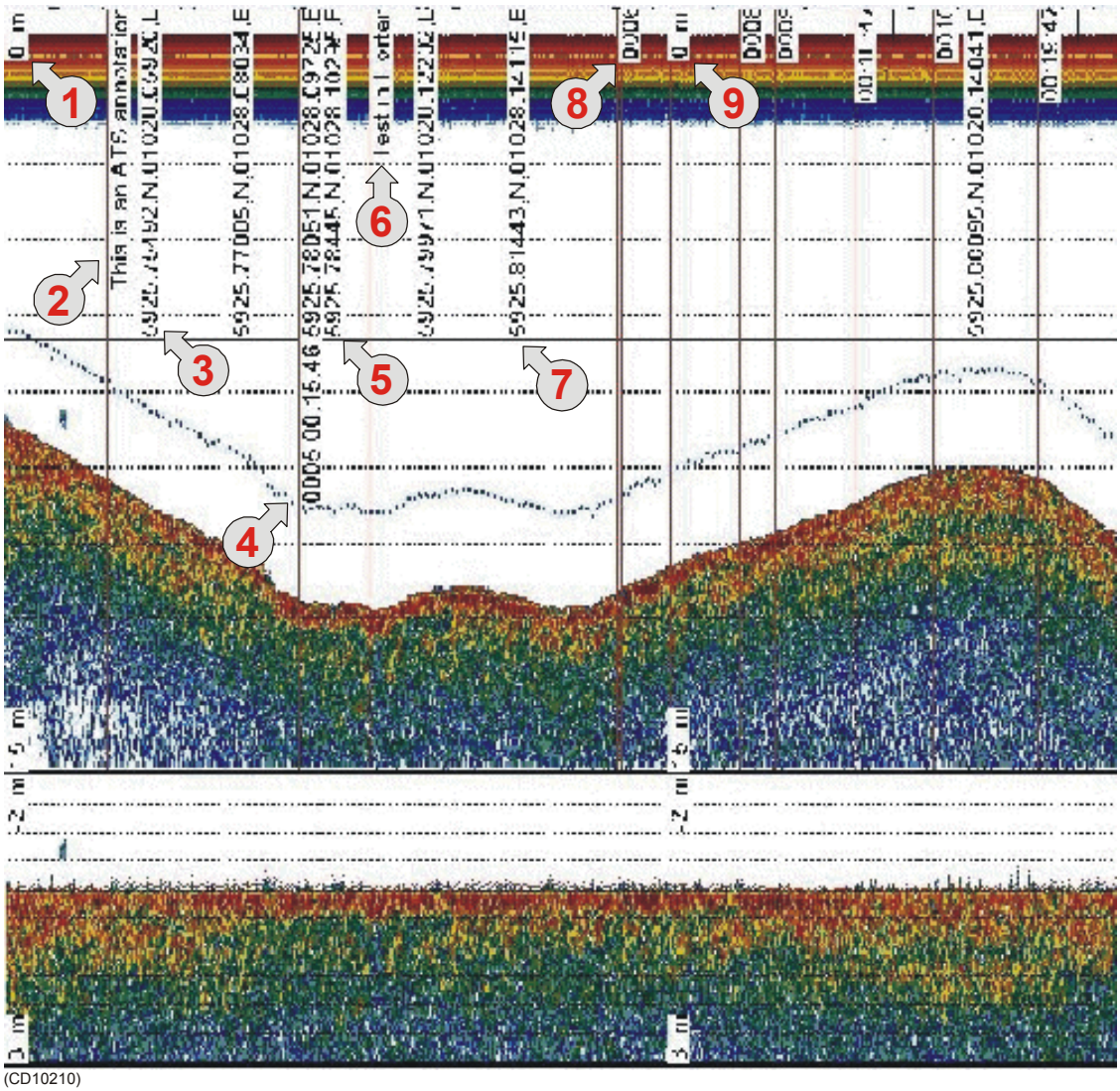


Figure 6 History and printer presentation

(4) One **Event** annotation with both navigational and time information added. This annotation is controlled by the parameters in the **Annotation** dialogue box. It will only appear on the printer output and in the History when you press the **Event number** in the **Status bar**.

(5) One annotation with navigational information. This is identical to item 3.

(6) One **Text** annotation with the text “Test in Horten”. This text is entered in the **Annotation** dialogue box. You will need a keyboard connected to your echo sounder to do this.

(7) Two annotations with navigational information. This is identical to item 3.

(8) One **Event** annotation with no additional information added. The number shown (”0006”) is the event number. The annotation appears on the printer output and in the History when you press the **Event number** in the **Status bar** .

(9) One depth annotation. This is similar to item (1).

(Others) Several other annotations to provide examples.

To add **Text**, **Time** and **Event** annotation, you must open the **Annotation** dialogue box. This box is accessed from the **File** menu.

Additional text to the printer and History window is controlled by the parameters in the **Printer and History** dialogue box. This box is accessed from the **File** menu.

GETTING STARTED

Introduction

This chapter will guide you through the main operations of the ES60 by the use of an operational example. The intention with this chapter is to provide you with an overview of the main functions in the echo sounder, and to demonstrate how the ES60 may be used in a realistic operational situation.

Related topics

→ *Before you start, page 27*
→ *Start-up, page 28*
→ *Operation, page 30*
→ *Data storage, page 35*
→ *Operational procedures, page 37*

Before you start

Before you start the ES60, make sure that the necessary hardware items are correctly installed and connected. The transducer(s) must also be defined in the ES60 software on the computer.

Related topics

→ *ES60 Installation manual*

Start-up

Overview

This chapter provides the basic procedure required to power up the echo sounder and start the pinging.

Power-up procedure

After these initial preparations you can open the ES60 program on the computer. The "power on" procedure is described in detail in the *Operational procedures* chapter.

The menu system

The menu system is based on the Microsoft Windows® commercial standard interface. An overall explanation of the menu system with a description of the various views are presented in the *Display views* chapter.

Transceiver inspection

First, we need to check that the transceiver (or transceivers) are connected.

Open the **Install** menu, choose the **Transceiver** command to open the **Transceiver Installation Mode** dialogue box. In this dialogue, press the **Inspect** button to open the **Transceiver Settings** dialogue box.

You may now check that the transceivers are installed correctly. Active transceivers appear in green text in the **Frequency Channel Selection** box.

Click the **Cancel** button to finish.

If none of the transceivers listed appear in green text, check the connections and re-install the transceiver(s).

Environmental parameters

To obtain correct values for the various acoustical parameters calculated by the ES60 program, it is important that you provide the ES60 program with accurate parameters describing the environment; sea temperature, salinity and sound velocity.

These values are defined in the **Environment** dialogue box.

Open the **Install** menu, choose the **Environment** command to open the **Environment** dialogue box.

Unless the default values are acceptable, you must select **Fresh** or **Salt water**, and enter the current sound velocity. This information is used to calculate depth and absorption coefficient.

Click **OK** when you have finished.

Navigation interface

To link acoustical data with navigational data the ES60 must be able to receive data provided by a GPS or another positioning system. The **Navigation Interface** dialogue box is used to define the parameters to achieve this.

Open the **Install** menu, choose the **Navigation** command to open the **Navigation Interface** dialogue box.

Specify how the ES60 will receive navigational data. Since the NMEA standard has been implemented, you only need to choose between NMEA or ASCII.

If ZDA clock is available, the PC system clock can automatic be synchronised with ZDA input. Then choose “Automatic Set Clock”.

Click **OK** when you have made the setting.

Additional interfaces

Additional interfaces have been provided for other peripheral systems.

- If you need to link recorded acoustical data with trawl position data, choose the **Trawl** command on the **Install** menu to specify the trawl position interface.
- If you need to connect your ES60 to a purse seine system, choose the **Purse seine** command on the **Install** menu to specify the purse seine system interface.

If you want to use a heave or a temperature sensor, choose the **Heave** and **Temperature** commands on the **Install** menu to specify these interfaces.

Related topics

→ *Power on/off procedure, page 38*
→ *Display views, introduction, page 12*
→ *Frequency channels installation procedure, page 44*
→ *Transceiver Installation, page 117*
→ *Transceiver Settings, page 119*
→ *Environment, page 89*
→ *Navigation Interface, page 100*
→ *Heave Sensor, page 93*
→ *Temperature Sensor, page 116*
→ *Trawl Interface, page 122*
→ *Purse Seine, page 109*

Operation

Overview

This chapter describes a few of the most common functions used during normal operation.

Selecting operational mode

You are now ready to start the actual operation of the ES60 echo sounder. The first thing to do is to choose operational mode.

Open the **File** menu, choose **Operation** to open the **Operation** dialogue box. In the **Mode** group, click **Normal** for normal mode.

(You may alternatively click **Replay** for replay mode, but you must then also click **Files** to choose a replay file. Note that operating in replay mode will restrict you from changing certain parameters during operation.)

Next, you need to define the ping rate. To do this, locate the **Ping Rate** group box, and set the ping rate to **Interval** for manual setting of the ping interval. For this exercise, set the ping interval time to 1 second, and click **OK** to finish.

The echo sounder will now start pinging, and after a few moments the echogram field on the display will present a new echo line. The various fields on the display are explained in detail in the *Display views* chapter.

Transceiver settings

The operational mode and the transceiver frequency are displayed to the far left in the **Header** view. A dedicated dialogue box - **Transceiver Settings** - is used to define various parameters associated with the transceiver. These settings include transceiver mode, the depth of the transducer surface, the transmit power, and the pulse length.

To open this dialogue box, position the cursor over the mode and frequency information in the **Header** view, and click the right mouse button. Specify the estimated depth of the transducer surface, and set **Transmit Power** to its maximum value. Set the **Pulse Length** to a medium value of 1.024 ms (for 38 kHz), and click **OK** to accept the settings.

The chosen pulse length will result in an acceptable resolution of approximately 0.75 m, and acceptable signal-to-noise ratios at the depths considered in this example.

Note that if you operate in **Replay** mode, the transceiver settings can not be changed.

Additional information about the transceiver settings are available if you press the **Advanced** button in the **Transceiver Settings** dialogue box.

Bottom detector settings

The **Header** view on the display is also used to present the current depth. The **Bottom Detector** dialogue box is used to define various parameters associated with the bottom detection. These include the depth range, where the ES60 searches for the bottom.

In our example we will assume that the depth will vary between 30 and 200 meters. Therefore, set **Minimum Depth** to 30 m and **Maximum Depth** to 200 m. Click **OK** to accept the settings.

Note

Setting both Minimum Depth and Maximum Depth to 0 m will turn off bottom detection.

Colour scale

The **Colour Scale** field is used to display the colour scale for mapping acoustical values. These colours are used in the **Single Echo** and **Echogram and Range** views. Each colour always represents a 3 dB value range. Using all 12 colours in the colour scale thus enables mapping of a 36 dB value range to colours.

Position the cursor over the colour scale, click the right mouse button to open the **Colour Scale** dialogue box. Accept the default settings and click **OK**.

Single Echo view

The **Single Echo** view on the display contains information on detection of single echoes. Two plots are visible in this view.

- One plot shows a histogram of the TS distribution for the single echoes detected in the **Echogram and Range** view. For an accurate x-axis value, place the cursor inside the coordinate system, and read the value from the displayed label.
- The other plot shows the position within the beam of the detected single echoes for the current ping (largest circles) and the three previous ping (smaller circles).

- The upper right corner of the view shows the s_A value calculated using the integration values in the **Echogram and Range** view.

Position the cursor in the **Single Echo** view, click the right mouse button to open the **Echo Trace** dialogue box.

Click the **TS Detection** button to open the **TS Detection Parameters** dialogue box.

The **TS Detection Parameters** dialogue box contains parameters used by the ES60 program to detect single echoes. These parameters are essential for determining which echoes are accepted as single echoes. Thus, if fish abundance estimation is based solely on single echo detection, this estimate may be affected by the choice of single echo detection parameters.

If you choose to store raw acoustical data during a survey, you can later change the single echo detection parameters using **Replay mode**. This allows you to examine the sensitivity of the fish abundance estimation to the value of the single echo detection parameters.

Click **OK** to accept the default settings and to exit the **TS Detection Parameters** dialogue box. Click **OK** once more to exit the **Echo Trace** dialogue box.

Echogram and Range view

The **Echogram and Range view** consists of an **Echogram** field to the left and a **Range** field to the right. These are separated by the range axis. The **Echogram** field contains information about the acoustical values, while the **Range** field is used for specifying the range used in the **Echogram** field.

Echogram field

The **Echogram** field is used to display acoustical values for each ping. The settings in the **Colour Scale** are used to determine the colour sensitivity in the echogram.

Position the cursor in the **Echogram** field, and click the right mouse button to open the **Echogram** dialogue box.

The **Echogram** dialogue box allows you to define the area of interest for the echogram. Your choice will affect the meaning and the options in the **Range** field in the **Echogram** view. You can also choose the TVG function used to calculate the acoustical values.

In this example, choose **Surface – Manual** to enable a surface related echogram. Then, choose the **School gain** TVG function for calculating s_V-values. Finally, click **OK** to accept the settings.

Range field

The **Range** field allows you to read and specify the range used in the **Echogram** field. The current range is displayed on the range axis. In the **Range** dialogue box you can define the area of interest for the echogram.

Position the cursor in the **Range** field, click the right mouse button. Observe a dialogue box referring to either **Surface** or **Bottom** depending on your choice in the **Echogram** dialogue box.

In this case, check that you have the **Surface Range** dialogue open.

Set **Range** to 200 m and **Start Relative Surface** to 0 m, then click **OK** to accept the settings.

Comments to the Echogram and Range view

Two echograms are shown for each **Channel**. The second echogram for the present **Channel** may be used in the current example to show the distribution of fish close to the bottom.

- Use the **Echogram** dialogue in the second **Echogram** view to set the **Echogram** to **Bottom** and choose the **School gain** TVG function for calculating S_V-values.
- Use the corresponding **Bottom Range** dialogue to set **Range** to 20 m and **Stop Relative Bottom** to 5 m for the echogram to show values calculated from 15 m above the detected bottom to 5 m below the bottom.

Remember that the area of interest defined in the **Echogram** view is also used for the **Single Echo Detection** view limits.

When you place the cursor in the **Echogram** field, you can use the mouse wheel to modify the receiver gain level, and hence the display colour sensitivity. Each click of the wheel corresponds to a 1 dB change. The same colour sensitivity setting is available from the **Color Scale** dialogue box.

Whenever the cursor is located within the **Echogram** field, a small yellow label is visible. The label provides the following information:

- **Left**: Depth at the cursor position
- **Middle**: Diameter coverage at the transducer beam at the current cursor position
- **Right**: Current gain setting

To change the range, you can also use the mouse wheel. Place the cursor inside the **Range** field to do this:

- In a surface related echogram you will modify the range, while for a bottom related echogram, you will change the start range.
- If you press the left mouse button while using the mouse wheel, the surface echogram will change its start value, while the bottom related echogram will change its range.

Scope view

The **Scope** view is the rightmost view and shows a scope view of the last ping corresponding to the settings in the **Echogram** view.

This view draws a range of horizontal symmetrical colour lines. The distance from the vertical center axis and the line colour reflects the received echo amplitude. A black horizontal line across the view indicates the current bottom view.

Related topics

→ *Display views, introduction, page 12*
→ *Transceiver Settings, page 119*
→ *Advanced Transceiver, page 71*
→ *Bottom Detector, page 78*
→ *Colour Scale, page 81*
→ *Echogram, page 85*
→ *Surface Range, page 115*
→ *Echo Trace, page 84*

Data storage

Overview

This chapter presents a brief description of the data storage functionality.

Note that you can not perform all the operations described here if your echo sounder does not have a keyboard.

Define storage parameters

It will often be beneficial to store some of the echo information recorded during an operation. This allows you to change certain parameter settings when operating in replay mode at a later time.

Open the **File** menu, choose **Store** to open the **Store** dialogue box.

Note

*Note that **Store** is not available when operating in **Replay** mode.*

The **Store** dialogue box allows you to set various parameters associated with data storage. You can define a specific directory, and limit the file sizes.

Click **Browse** in the **Survey** box. Browse to the desired directory for file storage, or enter the directory name directly into the text box. If the directory does not exists it will be created.

Click the **Save Raw Data** check box to save raw data. Define maximum file sizes by entering the desired value in the **Max File Size** box, and click **OK** to accept the settings.

When **Save Raw Data** is checked, the raw unprocessed transceiver data containing amplitude and angle information for the split beam transducers will be recorded.

Start and stop data storage

To start and stop data storing, use the **Line field** in the **Status bar**. The **Line field** is marked **LXXXX** and shows the current survey line number.

Position the cursor over the **Line field** in the **Status bar** and click the left mouse button. Observe that the survey line number increments, and that the line colour changes from black to red.

To stop data recording click the **Line field** again.

The red colour indicates that data recording is active. When the recording stops, the colour is changed back to black. The file names used for the stored data are determined by the survey line number and the date and time when recording started. A new file is created for each new survey line number.

Note that the depth range used for data collection and data storing is determined from the maximum range settings in the **Echogram** view, the bottom detection settings, and the settings in the **BI500** dialogue box.

Related topics

→ *Store, page 113.*

OPERATIONAL PROCEDURES

Overview

This chapter contains a number of specific procedures to be used with your ES60 echo sounder.

Topics

→ *Power on/off, page 38*
→ *Basic operations, page 40*
→ *Transceiver installation, page 44*
→ *Record and playback, page 46*
→ *Software installation and upgrade, page 51*
→ *Size distribution, page 54.*

Power on/off

Use the following procedures to switch the ES60 echo sounder on and off.

Power on

It is assumed that the echo sounder's hardware and software are properly installed and configured.

1 Switch power on.
- The location of the power switches are individually assigned. The computer has its own power switch. The transceiver(s) must be connected to separate power supplies, and should have a remote power switch.

2 Observe the hardware test messages and operating system start-up messages.
- It takes a couple of minutes before the echo sounder window appears on the display.

The echo sounder memorises all its settings when power is switched off.

If pinging does not start you must check the settings in the following dialogue boxes:

- Operation
- Layout
- Transceiver Settings
- Transceiver Installation

If you are not successful you should use this procedure:

1 Check the **Transceiver Installation** dialogue box.

2 All frequency channels must be properly installed.

3 Select **Factory settings** in the **Options** menu.

Power off

To switch off the ES60 echo sounder, observe the following procedure.

1 Select **Shutdown** on the **File** menu.

2 Allow the computer to close all the echo sounder software applications.
- The computer power is switched off.

3 Switch off power.

4 Switch off the power on the General Purpose Transceiver and other peripherals (if any).

Related topics

→ *Operation, page 102*
→ *Layout, page 99*
→ *Transceiver Settings, page 119*
→ *Transceiver Installation, page 117*
→ *Options menu, page 61*

Basic operations

Overview

This chapter presents a number of common procedures frequently carried out on the ES60 echo sounder.

Changing the echogram settings

To change the echogram settings:

1 Position the cursor in the **Echogram** field.

2 Click the right mouse button.

3 Observe the **Echogram** dialogue box.

4 Make the required changes.

Related topics

→ *Echogram, page 85*

Changing the range

To change the range:

1 Position the cursor in the **Range** field.

2 Click the right mouse button.

3 Observe the **Bottom Range** or **Surface Range** dialogue box.

4 Make the required changes

or:

1 Place the cursor in the **Range** field.

2 Use the mouse wheel to change the range.

Related topics

→ *Bottom Range, page 80*

→ *Surface Range, page 115*

Changing the vertical resolution

The vertical resolution of the echogram increases with a shorter pulse length.

For example, a pulse length of 1.024 millisecond gives a vertical resolution of 19.2 cm, whereas a pulse length of 0.256 millisecond gives a vertical resolution of 4.8 cm. If the vertical distance between two echoes is less than this, the two echoes will be shown as one

To change the pulse length:

1 Position the cursor over the frequency information in the **Header** view, and click the right mouse button.
   - The **Transceiver Settings** dialogue box opens.
2 Move the pulse length slider to the desired pulse length value.
3 Click **Ok**.

A small value gives the best resolution, while larger values are mostly used for navigation and fishing in deep waters.

Related topics

→ *Header view, page 17*
→ *Transceiver Settings, page 119*

Changing the transmit power

To change the transmit power:

1 Position the cursor over the frequency information in the **Header** view, and click the right mouse button.
   - The **Transceiver Settings** dialogue box opens.
2 Move the transmit power slider to the desired value.
3 Click **Ok**.

Related topics

→ *Header view, page 17*
→ *Transceiver Settings, page 119*

Setting minimum and maximum depth

Setting the minimum and maximum depth controls where the echo sounder will search for bottom lock.

Note

Setting both Minimum Depth and Maximum Depth to 0 m will turn off bottom detection.

---

1 Position the cursor over the depth information in the **Header** view, and click the right mouse button.
   - The **Bottom detector** dialogue box opens.
2 Set minimum and maximum depth to the desired values.
3 Click **Ok**.

Related topics

→ *Header view, page 17*

→ *Bottom Detector, page 78*

Enabling the depth alarms

You can set individual alarms for minimum and maximum depth. You can also enable an alarm to sound off if the bottom track is lost.

1 Position the cursor over the depth field in the **Header** view, and click the right mouse button.
   - The **Bottom detector** dialogue box opens.

2 Set the values for minimum and maximum depth alarm.

3 Enable the alarms by ticking the appropriate boxes.

4 Enable the **Bottom Lost Warning** if required.

5 Click **Ok**.

Related topics

→ *Header view, page 17*

→ *Bottom Detector, page 78*

Adding annotations

You can add several different annotations to the displayed and printed information. All annotations are automatically displayed, while you need to enable the annotations to be printed.

Enable annotations to be printed

1 Select **Print** on the **File** menu.
   - The **Printer and History** dialogue box opens.

2 Under **Text to printer**, click **Annotation**.

3 Click **OK** to exit.

The annotations will be printed until this procedure is repeated.

Enter annotations

Three different annotations may be controlled from the **Annotations** dialogue box.

1 Select **Annotation** on the **File** menu.
   - The **Annotation** dialogue box opens.

2 To enter a single text annotation to the display:

a Enter the desired annotation text into the **Text** box. A keyboard must be connected to the echo sounder to allow this.

b Click **OK**.

c The text you entered is displayed immediately, but it will not be repeated.

3 To add the current time as an annotation:

a Under **Time**, click **Active**.

b Enter the desired interval (in seconds) between the annotations.

c Click **OK**.

d The annotation will be repeated at the chosen interval until it is switched off.

4 To add an event annotation:

a Under **Event**, select a start number.

b Click **Increase** or **Decrease** to count the Event number up or down.

c Click **Add Time** if you wish the event annotation to include the current time.

d Click **Add Navigation** if you wish the event annotation to include the current position.

e Click the **Event** button on the **Status bar** every time you wish the annotation to be added to the display and/or print.

Enable external annotations

The echo sounder will accept external text annotations when these are input on the serial line. This function is permanently enabled.

Related topics

→ *Annotation, page 73*

→ *Printer and History, page 105*

→ *Annotation format, page 74*

Transceiver installation

Overview

Use the following procedures to install, modify or delete frequency channels from the echo sounder set-up.

General Purpose Transceivers (GPT) physically connected to the echo sounder's Ethernet interface are identified automatically by the system. When you open the **Transceiver Installation** dialogue box from the **Install** menu, a list will be provided.

The ISA bus is also searched for PC Transceiver plug-in boards, and these are displayed in the same list.

A single frequency transceiver occupies one entry in the list, and a dual frequency transceiver occupies two. Each entry is identified as a **frequency channel**, and the line displays the parameters for the channel. Entries in the frequency channel list are shown in **black**, **green** or **red** colour identifying its current status.

To install a channel

1 Select **Transceiver** on the **Install** menu.

2 Select **Modify** in the **Transceiver Installation Mode** dialogue box.

- The **Transceiver Installation** dialogue box opens, and you are allowed to make changes.

3 Click the desired entry (one of the black colour line alternatives) in the **Frequency Channel Selection** list.

4 Assign a transducer by selecting a transducer name in the **Transducer Selection** list.

5 Click **OK** to accept the choice and exit the dialogue box.

6 Restart the echo sounder as described below.

To uninstall a channel

1 Select **Transceiver** on the **Install** menu.

2 Select **Modify** in the **Transceiver Installation Mode** dialogue box.

- The **Transceiver Installation** dialogue box opens, and you are allowed to make changes.

3 Click the desired entry in the **Frequency Channel Selection** list.

4 Select the alternative NONE in the **Transducer Selection** list.

5 Click **OK** to accept the choice and exit the dialogue box.

6 Restart the echo sounder as described below.

To modify an IP address

This procedure allows you to modify the IP address of the currently selected General Purpose Transceiver (GPT).

1 Select **Transceiver** on the **Install** menu.

2 Select **Modify** in the **Transceiver Installation Mode** dialogue box.

- The **Transceiver Installation** dialogue box opens, and you are allowed to make changes.

3 Select the General Purpose Transceiver (GPT) you wish to modify.

4 Click the **Set New GPT IP Address** button.

- The **IP Address** dialogue box opens.

5 Enter the new IP address.

- The significance of the address numbers is described with the **IP Address** dialogue box.

6 Click **OK** to accept the choice and exit the dialogue box.

7 Click **OK** to exit the **Transceiver Installation** dialogue box.

8 Restart the echo sounder as described below.

Related topics

→ *Transceiver Installation, page 117*

→ *IP Address, page 96*

Restart the echo sounder

Whenever a change has been made to any of the frequency channels, you must restart the echo sounder.

1 Select **Operation** on the **File** menu.

- The **Operation** dialogue box opens.

2 Select **Normal** operation, and click **OK**.

Related topics

→ *Operation, page 102*

Record and playback

Overview

You can set up the echo sounder to record the unprocessed transducer signals on the internal harddisk or other recordable media. This recorded signal may later be injected into the echo sounder's processing software as if it arrived directly from the transceiver.

During this replay, you may experiment with some of the echo sounder settings.

This feature is useful during training and demonstration. It is also useful for memorising a particularly interesting observation at the fishing grounds.

You can also use the built-in **History** function to record echogram data.

Record

Preparations

The recording is prepared as follows.

1 Select **Store** on the **File** menu.
- Observe the **Store** dialogue box appear.

2 Select the complete path of the survey directory.
- The directory is selected when you click the **OK** button. Click the **Browse** button if you wish to navigate through the disk directories. A new directory is created if the requested does not exist.

3 Select if you wish to save raw and/or output data.
- **Raw data:** The unprocessed transceiver data are stored in standard computer files. These files contain all the necessary data for reconstruction of the situation during the real survey. Thus the data include amplitude, phase, navigation data, annotation input etc. The echo sounder program reads these files during replay.
- **Output data:** This is the processed output data; navigational data, bottom detections, annotations etc
- **xyz data:** This is processed and interpolated xyz data in ASCII format. Note that navigation input must be available.

4 Select the initial line number.

5 Enter the maximum size of each replay file.

6 Click **Ok**.

Start recording

Use the **Line** field in the **Status** bar to start the recording.

1 Position the cursor over the **Line** field.

2 Press the left mouse button.

The line number increments, and the **Line** field is presented with a red colour.

Stop recording

To stop the recording:

1 Click the **Line** field once again.
- The original colour is restored.

Size of stored raw data

The total size of raw data files stored on disk during operation depends on several user selections. From these selections you may estimate approximately the total amount of raw data stored in a given time period for each installed channel using the following equation:

X = (**B** bytes per sample) • ((8 • **R**) / (**c** • **tau** samples per ping)) • (**M** ping per sec) • 24 • (3600 sec per day) • (**K** days)

Where:

X = Total amount of stored raw data in bytes for one channel

B = 4 (Given by the echo sounder)

R = Maximum range in meters (User set)

c = Sound speed in water in meters per sec (User set)

tau = Pulse duration in seconds (User set)

M = Ping rate in ping per seconds (User set)

K = Number of operating/storage days (User set)

Thus, you can affect the amount of stored raw data by changing e.g. the range, pulse duration, and ping rate settings.

Example:

With range = 10 m, pulse length = 256 μS, 15 pings per second and sound velocity = 1500 m/s, the storage requirement will be **45 Mb** per hour. If you increase the range to 80 m, and reduce the ping rate to 7 pings per second, the storage requirement will be **60 Mb** per hour.

Related topics

→ *Store, page 113*

→ *Status bar and Line field, page 66*

Playback

When replaying the recorded signal, the ping rate is not limited by the speed of sound in water. Hence, a higher ping rate is possible during replay than during normal operation.

The playback is started as follows:

1 Select **Operation** on the **File** menu.
   - Observe the **Operation** dialogue box appear.

2 Click **Replay**.

3 Click **Files...**
   - Observe the **Replay** dialogue box appear.

4 Select survey with the standard file selection dialogue.

5 Click on the file(s) you wish to replay.
   - Observe that the currently selected file(s) appear in the **Selected files** list box.

6 Click **Loop** if you wish the replay to loop through the selected file(s) endlessly.

7 Click **Save Output Data** if you wish to record the file(s) in processed format during playback.
   - The files are stored with the same name and in the same location as the raw data files, but with the file extension *.OUT

8 Click **OK** to return to the **Operation** dialogue box.

9 In the **Operation** dialogue box, click **OK** to start the playback.

If you do not select **Loop**, the replay is stopped when the last recorded ping has been processed.

Related topics

→ *Operation, page 102.*

→ *Replay, page 110.*

History

The **History** function is used to store echograms on bitmap format. The echo sounder may continuously save echogram pictures to the internal harddisk or an other recordable media. These can later be recalled on the display. The information in the **History** window is the same as on the printer.

The horizontal width of each echogram picture roughly corresponds to the the half width of the display. The number of history files is limited. After reaching the maximum number of files, the newest echogram picture overwrites the oldest one. The history function allows you to quickly look through echogram pictures covering several hours.

Record

To start **History** recording:

1 Select **Operation** on the **File** menu.
   - Observe the **Operation** dialogue box appear.

2 Click **Save** in the **History** field.

3 Click **Browse** to select disk directory.

4 Click **Ok** to start the recording.

To stop **History** recording:

1 Select **Operation** on the **File** menu.
   - Observe the **Operation** dialogue box appear.

2 De-select **Save.**

3 Click **Ok**.

Playback

To view the information recorded by the **History** function:

1 Select **History** on the **View** menu.

2 Browse the information in the **History** dialogue box.

The information provided by the **History** view is presented in a separate window. The echo sounder will operate normally in the background. However, you will not have access to any of the menues as long as the **History** window is open. When you wish to focus on the echo sounder operation, close or minimize the **History** window.

Print the current History information

To print the current view in the **History** window:

1 Select **History** on the **View** menu.

2 Press the printer symbol in the bottom right corner to print a single history file.
   - Note that only the file presented on the display is printed.

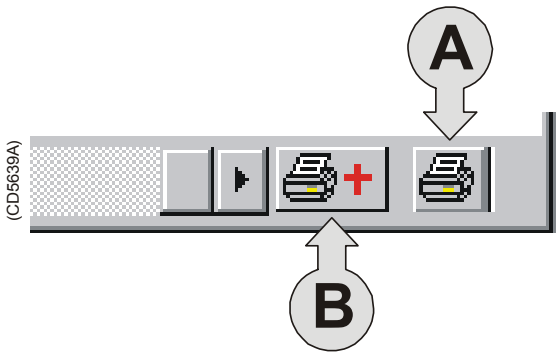
Print multiple History files

To print several images recorded by the **History** function, follow this procedure.

Note that a keyboard is required.

1 Select **History** on the **View** menu.

2 Browse the information in the **History** dialogue box until you find the images you wish to print.

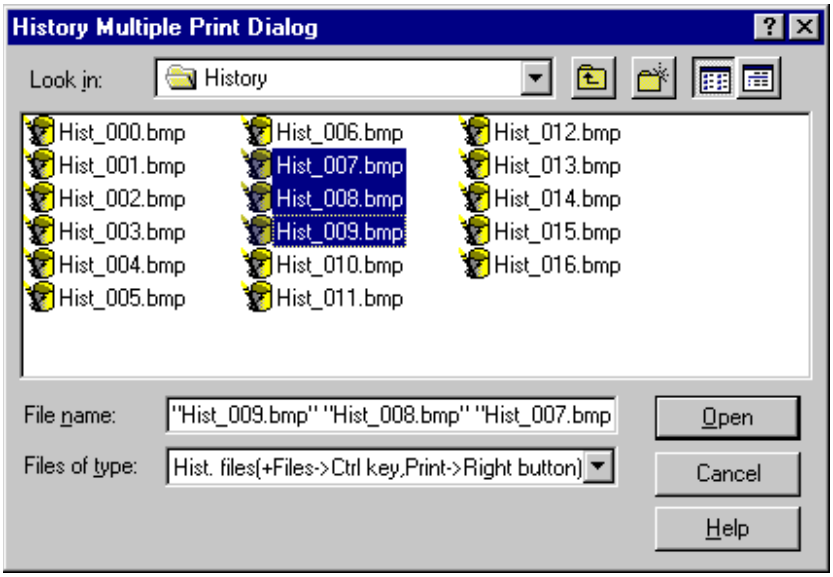


(A) Press to print current view

(B) Press to print multiple views

3 Press the left printer icon (with the + sign) in the lower right corner of the **History** window.

4 Press the **Ctrl** key on the keyboard and the left mouse button simultanously to select the images to be printed.



5 Press the right mouse button, observe the shortcut menu.

6 On the shortcut menu, select **Print**.

7 Press **Cancel** to close the dialogue box.

Related topics

→ *History window, page 22*

→ *History, page 95*

→ *Status bar; page 66*

→ *Operation; page 102*

Software installation and upgrades

Overview

The echo sounder is initially delivered with all necessary software installed and configured. Software upgrades are useful if your echo sounder fails, and you suspect a software error. An upgrade is also required whenever the echo sounder software is modified.

The computer should automatically detect the insertion of the CD-ROM and open the **Installation program** dialogue box. If this is not the case, you must manually run the **Setup.exe** program on the CD-ROM's root directory.

When the echo sounder software is upgraded, the software will automatically detect the presence of General Purpose Transceiver(s), but you will need to check that the correct transducer(s) are enabled.

Whenever new echo sounder software is installed, you will need to define all serial lines, transducer(s) and transceiver(s).

Related topics

→ *Transceiver installation procedure, page 44.*

Software installation procedure

Use this procedure if you need to install the software on a new computer. Note that minimum hardware and software requirements must be met by the computer.

1. Connect a keyboard to the echo sounder., or start the *On-screen keyboard* application (normally located under *Accessories* and *Accessibility*).
2. Switch on the echo sounder.
3. Insert the software CD.
4. Observe the **Installation program** dialogue box open.
5. If your Processor Unit is equipped with a built-in PCT transceiver, you must enter the correct values for I/O, DMA and IRQ. These values are given on the CD cover.
6. Press **Complete installation**.
7. Allow the echo sounder installation to run. Follow the instructions provided.
8. When requested, enter the license number.
   - This number is located on the CD cover. This number is unique for each individual echo sounder.

9 Click OK when prompted to reboot the system.

Software upgrade procedure

1 Connect a keyboard to the echo sounder., or start the *On-screen keyboard* application (normally located under *Accessories* and *Accessibility*).

2 Switch on the echo sounder.

3 Insert the software CD.

4 Observe the **Installation program** dialogue box open.

5 Press **Update installation**.

6 Allow the echo sounder installation to run. Follow the instructions provided.

7 When requested, enter the license number.

- This number is located on the CD cover. This number is unique for each individual echo sounder.

Un-installation procedure

Use this procedure if you need to remove all the echo sounder software from the computer. Note that all data in the ES60 directory will be erased.

1 Power up the computer.

2 Insert the ES60 CD-ROM.

3 Observe the **Installation program** dialogue box open.

4 Press **Uninstall**.

5 Allow the echo sounder un-installation program to run. Follow the instructions provided.

Software on a third party computer

The ES60 may operate with a locally purchased computer, provided that this computer meets the minuimum requirements defined by Simrad Horten. If in doubt, consult your dealer.

To install the software and operate the echo sounder from a third party computer, you will need to set up the computer correctly, and you will need a separate licence number.

How to set up the computer

This procedure assumes that you are familiar to the operating system. DO NOT attempt to set up the computer if you are unfamiliar with the settings described here, but consult your dealer.

1 Open the **Control Panel** to access the **Network connections**.

2 Open the **Local area connection**.

3 Press **Properties**.

- Observe the **Local Area Connection Properties** dialogue box appear.

4 Select the **General** tab, and click on **Internet Protocol (TCP/IP)**

5 Press **Properties**.

- Observe the **Internet Protocol (TCP/IP) Properties** dialogue box appear.

6 Click **Use the following IP address**, and enter the following IP address: **157.237.14.12**

- The Subnet mask will automatically be set to 255.255.0.0.

7 Click OK to accept the choice and to close the **Internet Protocol (TCP/IP) Properties** dialogue box.

8 Click OK in the remaining dialogue boxes until all are closed.

9 Restart the computer.

Size distribution

Purpose

If your ES60 is equipped with a splitbeam transducer, this procedure will provide you with the means to establish size distribution of anchovies and other pelagic schooled fish such as herring, capelin, sardines, horse mackerel, pilchard and tuna.

Procedure

Observe the following procedure to enable size distribution.

1 Set up two echo frames.

2 Right-click in each echo frame to open the **Echogram** dialogue box, and observe the following settings:

a Top frame:

- Echogram: Surface-Manual
- Bottom: White line
- Variable depth: On
- Range other: On
- Gain: School
- Ping filtering: Medium

b Bottom frame:

- Echogram: Surface-Manual
- Bottom: White line
- Variable depth: On
- Range other: Off
- Gain: Fish
- Ping filtering: Medium

3 Right-click on top of the mode and frequency information in the **Header** view to open the **Transceiver Settings** dialogue box. Make the following settings:

- Pulse length: 0,1 ms (or shortest)
- Transmit power: 1 kW (or maximum)

4 Right-click on the depth value in the **Header** view to open the **Bottom Detector** dialogue box. Make the following settings:

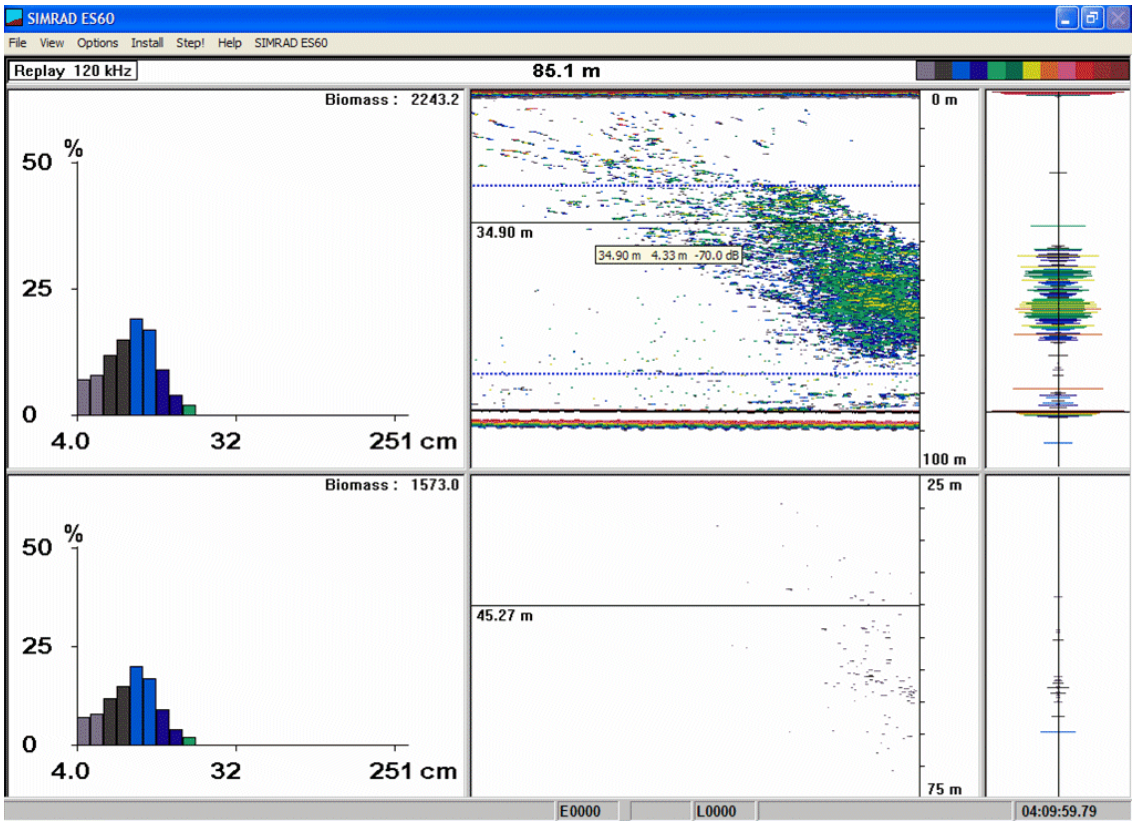
- Minimum depth: 0 m
- Maximum depth: 500 m (If the current depth is deeper than 500 m, det the maximum depth to 50% more than the current depth.
- Alarms and warnings: Off
- Backstep minimum level: -50 dB

- Bottom smoothing: On
- Alternative bottom detector: Off

5 Right-click on the colour bar in the **Header** view to open the **Colour Scale** dialogue box. Make the following settings:

- No TVG: 70
- School gain: 70 (or less, depending on fish size)
- Fish gain: 70 (or less, depending on fish size)
- Bottom gain: 60
- Limit regulation gain: Off

These settings will bring up two echo frames similar to the one provided below.



In the window, set the following ranges:

6 Right-click in the upper **Range** field to open the **Surface Range** dialogue box. Set the upper window from 0 to 100 meter.

7 Right-click in the lower **Range** field to open the **Surface Range** dialogue box. Set the range to 25 to 75 meter, or around the depth of the school.

8 Read the estimated size in the lower **Single Echo View**.

Adjusting to obtain correct fish length

Once an actual catch has been landed, you can adjust the echo sounder reading to obtain correct fish size.

1 On the **Install** menu, select **Fish** to open the **Fish Select** dialogue box.

2 Use the appropriate sliders to adjust the fish length.

REFERENCE GUIDE

Overview

This chapter describes the menus and dialogue boxes in detail.

Related topics

→ *Echo sounder menus, page 58*
→ *Dialogue boxes, page 68*
→ *Status bar, page 66*

Menus

Main menu

The **Main** menu contains the following options:

→ *File, page 59*
→ *View, page 60*
→ *Options, page 61*
→ *Install, page 63*
→ *Step, described below.*
→ *Help, page 65*

Note that a number of dialogue boxes are accessed directly using right-click on certain display fields.

Step!

In single-step mode you command the echo sounder to perform one ping at a time by left-clicking the **Step** command. This command does not activate any separate menus or dialogue boxes.

See the **Operation** dialogue box for further details.

Related topics

→ *Direct access to dialogue boxes, page 15*
→ *Operation, page 102*

File menu

The following commands are available on the **File** menu**:**

→ *Operation, page 102*
→ *Store, page 113*
→ *Annotation, page 73*
→ *Print, page 105*
→ *Shutdown, page 90.*

Operation

This command option opens the **Operation** dialogue box. Use these parameters to set echo sounder ping mode parameters; normal/replay, ping interval etc.

Store

This command option opens the **Store** dialogue box. Use this dialogue box to record data.

Annotation

This option opens the **Annotation** dialogue box. In this dialogue box you can enter an annotation text message to be printed on the echogram and/or saved to the current file.

Print

This command option opens the **Printer and History** dialogue box. Use it to set printer parameters controlling echogram printout on paper.

Shutdown

Select this command to terminate the echo sounder program.

Note *You must always use this command before you turn off power!*

View menu

The **View** menu contains the following options:

→ *Layout, page 99*

→ *History, page 95*

Layout

This command opens the **Layout** dialogue box. Use it to modify the layout of frequency channels on the display.

History

This command opens the **History** dialogue box. This is used to activate a dialogue for viewing previously recorded echograms.

Options menu

The following commands are available on the **Options** menu:

→ *Language, page 98*
→ *Depth unit, see below*
→ *Temperature unit, see below*
→ *Palette, see below*
→ *Beeper, see below*
→ *Save settings, see below*
→ *Restore settings, see below*
→ *Factory Settings, page 91*

Language

This entry opens the **Language** dialogue box for language selection.

Depth unit

All depth values are expressed in meters, English feet (1 ft = 0.3048 m), nautical fathoms (1 ftm = 1.852 m) or Italian Passi Braccia (1 pb = 1.65 m). The **Depth Unit** entry activates a submenu to select one of these alternatives.

Temperature unit

Water temperature is shown in degrees Celsius or degrees Fahrenheit on the **Status Bar**. The **Temperature Unit** entry activates a submenu to select one of the two alternatives.

Palette

Different light intensities on the display are provided according to IMO (International Maritime Organisation) recommendations. A bright display is required on a sunny summer day, and a low light intensity is required at night in order not to ruin the night vision of the crew at the bridge of the vessel. The **Palette** entry activates a submenu to select the display brightness.

Beeper

This entry activates a submenu to control when the audible warning signal is active to alert about status messages and alarms. No dialogues are provided.

Save settings

The echo sounder memorises all its parameter settings between power is turned off until it is turned on again at a later time. The **Save Settings** entry writes a snapshot of all parameter settings into static memory. No dialogues are provided.

Restore settings

This entry reads parameter settings from static memory into the echo sounder application. No dialogues are provided.

Factory settings

This entry copies the default factory settings back into the sounder. A proper clean-up of the complete menu system is sometimes required in order to escape from unintentional deadlocks. A dedicated dialogue box is used to acknowledge the function.

Install menu

The following commands are available on the **Install** menu:

→ *Transceiver, page 117*
→ *Environment, page 89*
→ *Navigation, page 100*
→ *Trawl, page 122*
→ *Purse Seine, page 109*
→ *Heave, page 93*
→ *Temperature, page 116*
→ *Fish, page 92*
→ *BI500, page 76*

Transceiver

This command opens the **Transceiver Installation** dialogue box. Use this to install a new transceiver, and to assign a transducer to each frequency channel.

Environment

Select this command to open the **Environment** dialogue box. The settings here are used to select salt or fresh water absorption, and to enter the sound velocity value.

Navigation

This command opens the **Navigation Interface** dialogue box. In this box, you can select communication parameters for the NMEA interface, and select input/output telegrams.

Trawl

This command option opens the **Trawl Interface** dialogue box. Use these parameters to select trawl instrumentation communication parameters; input/output telegrams.

Purse seine

This command option opens the **Purse Seine** dialogue box. Use these parameters to select trawl instrumentation communication parameters; input/output telegrams.

Heave

This command opens the **Heave Sensor** dialogue box. It is used to select heave input source; analogue or RS-232.

Temperature

This command option opens the **Temperature Sensor** dialogue box.

Fish

This command option opens the **Fish Select** dialogue box.

BI500

This command option opens the **BI500** dialogue box.

Help menu

The **Help** menu contains the following options:

- Contents
- About the echo sounder

Contents

This command opens the on-line user manual. This user manual is an HTML based document compiled to the CHM format designed by Microsoft™.

The content of the on-line user manual is identical to the first chapters in the printed manual.

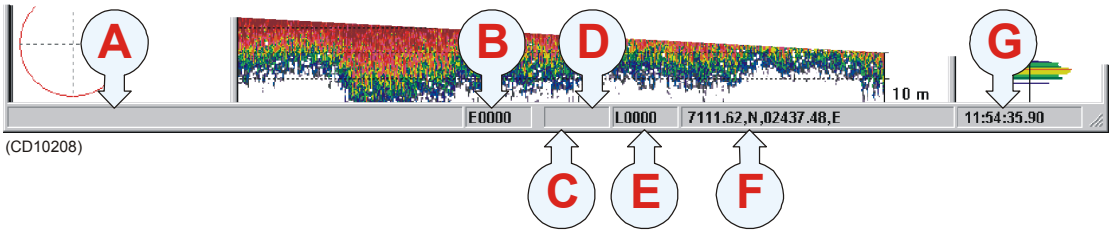
The on-line manual is also accessed directly as context sensitive help from the various dialogue boxes used throughout the echo sounder software.

About the echo sounder

This command opens the **About** box. This box is for information only. It provides the current software version and the copyright information.

Status Bar

The **Status Bar** at the bottom of the screen displays status messages, event number, printer active symbol, water temperature, navigational data (latitude and longitude) and time of day.



(CD10208)

The following information is provided on the **Status bar**:

(A) **Information -** Various messages are displayed in this field; warnings, status, information text.

(B) **Event -** This field implements a push button for generating an annotation of the “event” type. The event number is automatically incremented or decremented by one for each new event. The current event number is displayed.

(C) **Printer -** A printer symbol is displayed whenever echogram printing is active. Printing is delayed until the echogram page has been completed.

(D) **Temperature -** Water temperature is displayed in degrees Celsius or in degrees Fahrenheit provided a temperature sensor is connected to the system.

(E) **Storage line number** - This field acts as a toggle button. A left-click starts a recording, and another left-click terminates the recording. The line number is automatically incremented by one every time you start the recording. The current line number is displayed on the button facea, and it is shown with red colour during recording. The recording is controlled by the **Store** dialogue box.

(F) **Navigational data -** Geographical latitude and longitude from the navigation receiver is displayed.

(G) **Time -** Local time of day is displayed. A small popup window showing the current date appears when positioning the cursor inside the time field. During replay, this field is used as a timer.

Related topics

→ *Recording procedure, page 46*
→ *Store, page 113*
→ *Print and History, pages 105*
→ *Print Setup, page 107*

Dialogue boxes

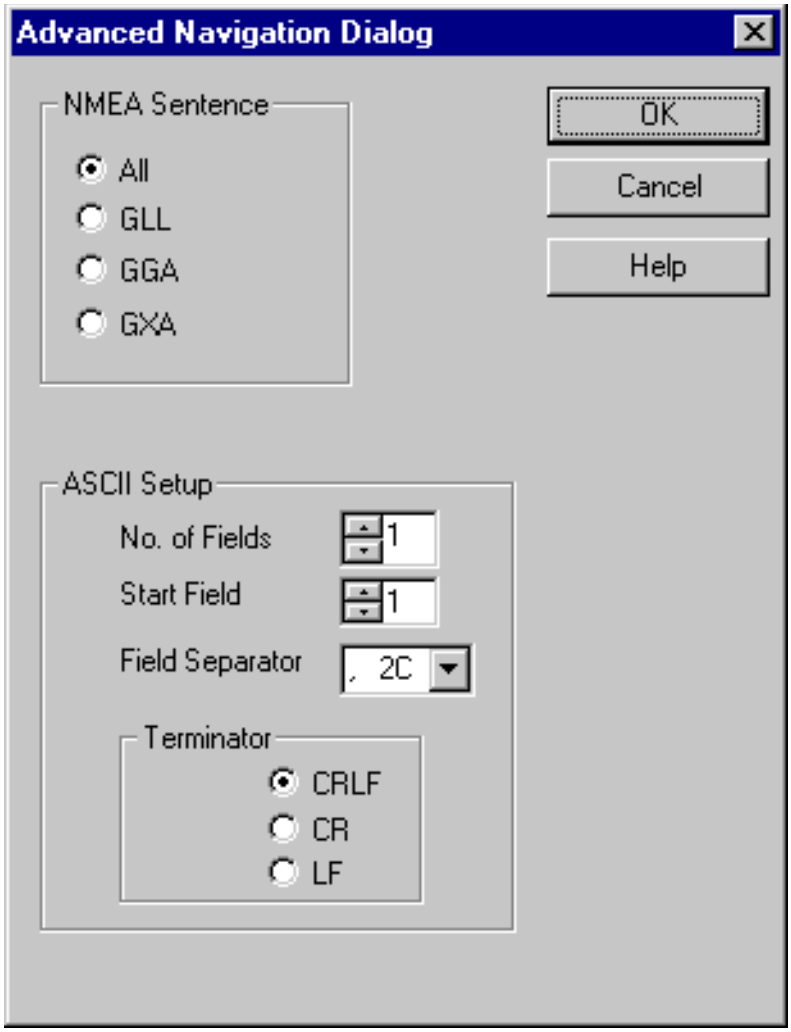
Introduction

The following chapters describe in detail all the dialogue boxes used in the ES60 echo sounder. The dialogue boxes are presented in alphabetical order.

→ *Advanced Navigation, page 69*
→ *Advanced Transceiver, page 71*
→ *Annotation, page 73*
→ *BI500, page 76*
→ *Bottom Detector, page 78*
→ *Bottom Range, page 80*
→ *Colour Scale, page 81*
→ *Depth Output, page 83*
→ *Echo Trace, page 84*
→ *Echogram, page 85*
→ *Environment, page 89*
→ *Exit, page 59*
→ *Factory Settings, page 91*
→ *Fish Select, page 92*
→ *Heave Sensor, page 93*
→ *History, page 95*
→ *IP Address, page 96*
→ *Language, page 98*
→ *Layout, page 99*
→ *Navigation Interface, page 100*
→ *Operation, page 102*
→ *Printer and History, page 105*
→ *Print Setup, page 107*
→ *Purse Seine, page 109*
→ *Replay, page 110*
→ *RS-232 Setup, page 112*
→ *Store, page 113*
→ *Surface Range, page 115*
→ *Temperature Sensor, page 116*
→ *Transceiver Installation, page 117*
→ *Transceiver Settings, page 119*
→ *Trawl Interface, page 122*
→ *Trawl Range, page 124*

Advanced Navigation

The **Advanced Navigation** dialogue box is accessed from the **Navigation Interface** dialogue box. The **Navigation Interface** dialogue box is in turn available from the **Install** menu.



NMEA Sentence

These boxes specify which type of NMEA navigation sentence should be automatically interpreted.

All means that any GLL, GGA and GXA sentences are interpreted.

ASCII Setup

Use this protocol if you wish to receive data on ASCII format.

Decoding is based on a user specified datagram identification. The information substring within the datagram may be identified by specifying the position of the start field, the number of fields to be extracted and the field separator.

No. of fields - Identify the total number of fields in the ASCII message.

Start field - Identify which of the fields in the message is the start field.

Field separator - Identify which ASCII character is used to separate the fields in the message.

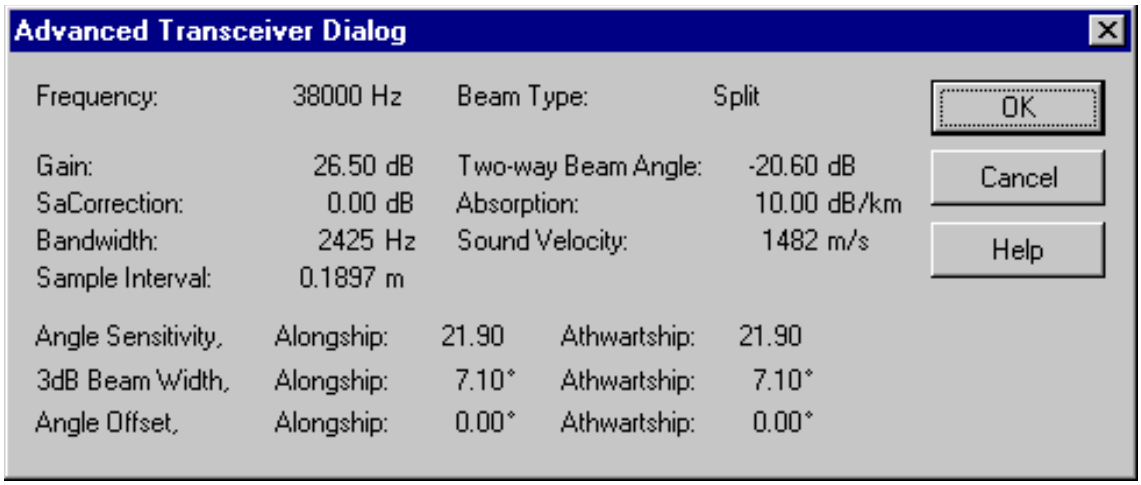
Terminator - Identify which character is used to terminate the message.

Related topics

→ *Navigation Interface, page 100*

Advanced Transceiver

This dialogue box is accessed from the **Transceiver Settings** dialogue box. It displays detailed numeric information characterising the channel. This includes transducer parameters, exact transmit frequency and receiver processing parameters.



Parameters

The parameters shown in this dialogue box are determined during the transceiver installation procedure.

The descriptions are included for information only. You do not need to understand these parameters to operate the echo sounder.

Frequency [Hz] - This is the nominal resonant frequency for the transducer.

Beam type - Three different transducer beam types are available: *Single*, *Split* and *Triple*. If your system is capable of operating a Split- or Triple beam transducer, it will also be able to measure the position of a target in the beam. The echo sounder can then compensate for the known beam pattern to obtain a true target strength.

Gain [dB] - The transducer gain presented by calculating the *directivity* multiplied with the *transducer's efficiency*. The value is obtained during system calibration. If no calibration takes place, the manufacturer's default setting is used.

Two-way beam angle [dB] - This is a key transducer parameter. The value describes the solid angle at the apex of the ideal conical beam.

Sa Correction [dB] - This parameter is determined during the calibration process. The value represents the correction required to the Sv constant to harmonize the TS and sA measurements.

Absorption [dB/km] - This value describes the absorption of sound in the water. The default values are computed according to *Francois and Garrison, Journal of Acoustic Society, December 1982*. The most important environmental variable affecting this parameter is found in the **Environment** dialogue box.

Bandwidth [Hz] - This is the resulting system bandwidth of the analogue and digital filters in the echo sounder receiver. The bandwidth is a function of the selected pulselength at a given frequency.

Sound velocity [m/s] - The speed of the sound through the water varies with temperature, salinity and pressure. The soundings provided by the ES60 are compensated for this.

Sample interval [m] - This value is always 1/4 of the current pulse length. In distance, the sample interval will be expressed as (*sound velocity* multiplied with *pulse length*) divided by *eight*.

Angle sensitivity - In order to convert the raw angle samples into mechanical degrees for fore-and-aft and athwartship directions, this parameter is required. It represents the ratio of electrical degrees to mechanical degrees for the current transducer. This ratio is not used with single beam transducers, and the value is set to 0.

3dB beam width [degrees] - This value presents the 3 dB beamwidth of the current transducer in the fore-and-aft and athwartship directions. The value is estimated during calibration. If no calibration takes place, the default value is used.

Angle offset [degrees] - This is the offset angle from the acoustical axis. The value is estimated during calibration. If no calibration takes place, the value 0 is used.

Related topics

→ *Transceiver Settings, page 119.*

Annotation

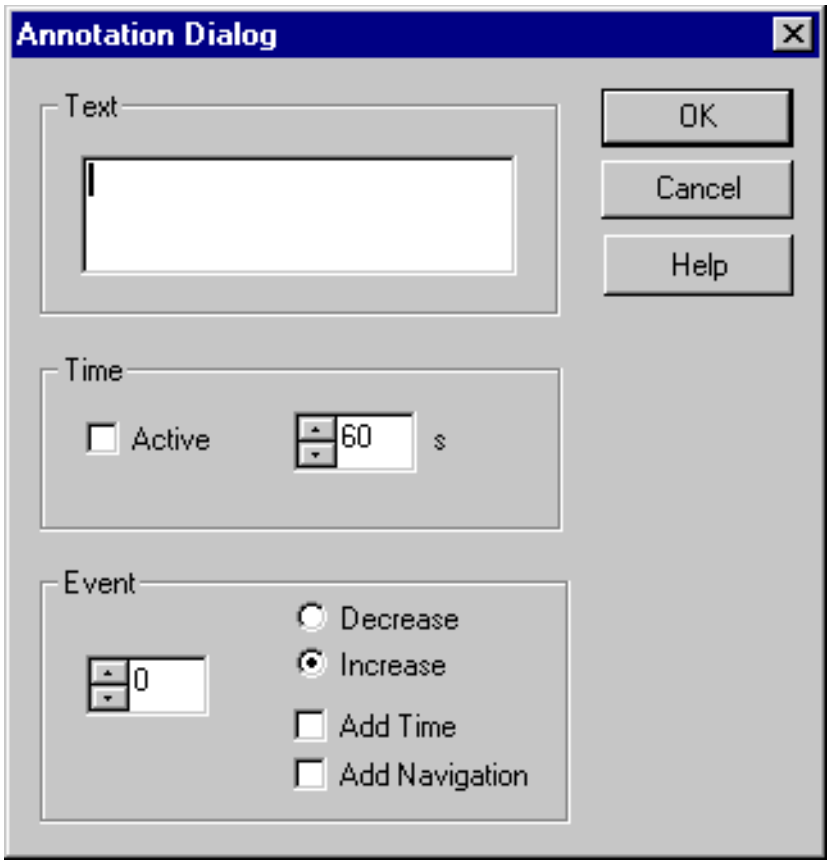
The **Annotation** dialogue box is opened from the **File** menu.

The ES60 echo sounder supports these different types of annotation:

- **Text** - use this function to enter your own text.
- **Time** - use this annotation to automatically generate a time marker at specified intervals.
- **Event** - use this annotation to generate an event number with optional addition of time and/or navigation.
- **External** - this function allows automatic annotation from an external source.

Note that the **Text** annotation is only available if you have a keyboard connected to the echo sounder.

An annotation telegram is written into the replay data file and the output data file. The annotation message is only shown inside the history window and on the echogram printout.



Text

The annotation text is entered here. Note that you need to have a keyboard connected to the echo sounder. The text can be entered freely, for example ”Dangerous wreck”. When you press the **OK** button the text is written into the echogram. The next time you open the **Annotation** dialogue box, the text is cleared, and you must enter new information.

Time

Click **Active** to activate automatic time annotation. Enter the desired time interval between the annotations. When activated, the sounder automatically generates annotations containing the current time at the chosen interval.

Event

Each event annotation is identified with an individual event number. The event annotation is then generated every time an event is generated. The event number is initially chosen here, and thereafter automatically incremented or decremented every time a new event is generated.

To generate an event, click **Event** in the **Status bar**.

The **Event** annotation can include current time and/or current longitude and latitude. Click applicable **Add Time** or **Add Navigation** to select. Without time or position data selected, the annotation message will simply contain the event number.

External events

External annotations may be input via the serial port for navigation as an NMEA telegram. The **Annotation** dialogue box does not support direct control of this function.

The external annotation has the following format:

$??ATS,this is a test<CR><LF>

The telegram header consists of:

1 the **$** character

2 two letters **??** (disregarded by the echo sounder, identifies the sender of the telegram)

3 three letters **ATS** (Annotation Text String - identifies the type of NMEA telegram).

4 a comma (NMEA separation character).

5 Text string (The echo sounder handles the string as an ordinary text. You can not use commas in the text string.)

6 A carriage-return and line-feed pair completes the telegram.

The ASCII telegram with the external annotation must be connected to the same serial line as the navigation system.

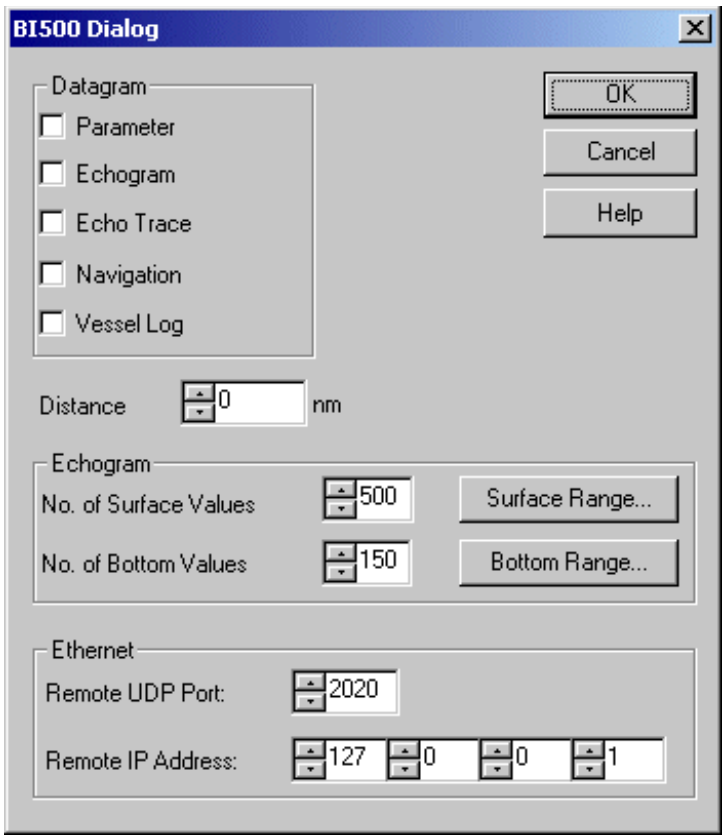
Related topics

→ *Status Bar, page 66*

BI 500

The BI 500 dialogue box is opened from the **Install** menu.

The ES60 echo sounder may communicate on an ethernet line with the BI 500 post-processing software. This dialogue box is used to set up the parameters for this communication, and to define which information the BI 500 shall receive.



Datagram

You can specify which datagrams to be transmitted to the BI 500 computer:

Parameter- Check this box if you want to transmit parameter data. The parameters required by BI 500 are sound velocity, frequency, pulse length and transducer type.

Echogram - Check this box if you want to transmit echogram data (surface and/or bottom related). Note that this data is required by the BI 500.

Echo Trace - Check this box if you want to transmit echo trace data.

Navigation - Check this box if you want to transmit the Navigation datagrams selected in the **Navigation Interface** dialogue box. Navigational data is required if you intend to use the map function in BI 500.

Vessel Log - Check this box if you want to transmit VesselLog datagrams. This datagram is required by BI 500 and is automatically generated based on the vessel speed.

You will normally transmit all the datagrams when operating ES60 together with BI 500. If you do not use the BI 500, do not export any datagrams.

The Echogram, Echo trace and Vessel log datagrams are identical to the corresponding datagrams transmitted by the Simrad EK500 echo sounder.

Distance

Use this parameter to (re)set the internal log distance counter. The current value of the log distance counter is shown at the time the BI 500 dialogue box was opened.

Echogram

You can here specify the layout of the echogram datagram.

No. of Surface Values - this value defines the number of surface based echogram values to be filled into the echogram datagram. This number should be 500 (default) when operating with the BI 500 post-processing software.

No. of Bottom Values - this value defines the number of bottom based echogram values to be filled into the echogram datagram. This number should be 150 (default) when operating with the BI 500 post-processing software.

Surface Range - Click this button to enter the **Surface Range** dialogue box. Here you specify the operating range for the surface echogram.

Bottom Range - click this button to enter the **Bottom Range** dialogue box. Here you specify the operating range for the bottom echogram.

Ethernet

These parameters are used to define the Ethernet connection with the BI 500 computer.

The **Remote UDP Port** and the **Remote IP Address** specified must correspond to the UDP port number and Internet address used by the BI 500 computer.

Related topics

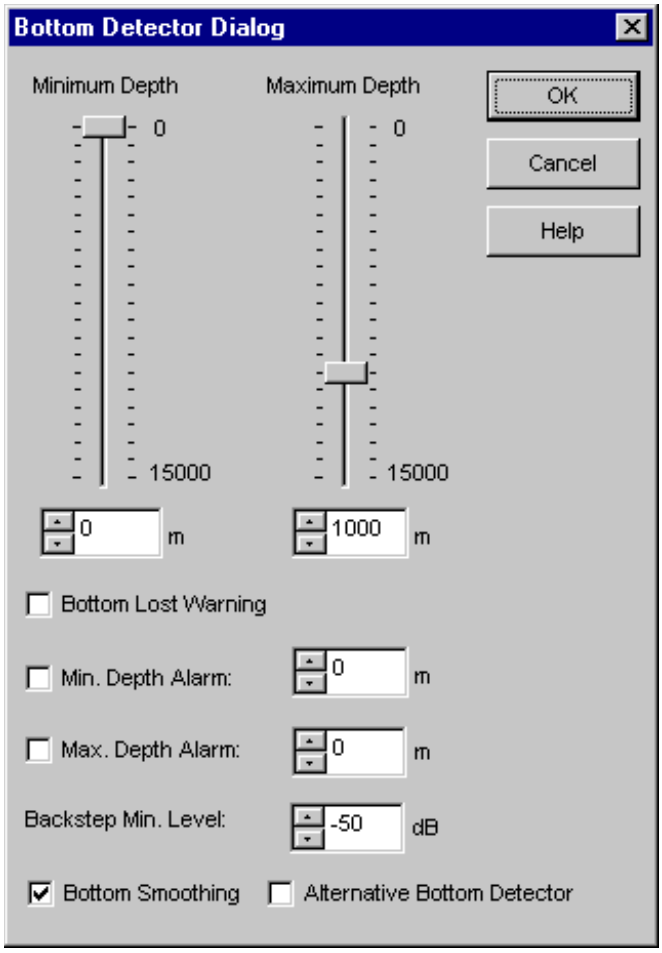
→ *Surface Range, page 115*

→ *Bottom Range, page 80*

→ *Navigation Interface, page 100*

Bottom Detector

The **Bottom Detector** dialogue box is opened when you right-click on the numeric depth value in the **Header** view on the display.



This dialogue box is used to define the upper and lower depth limits most likely to be used during the echo sounder operation. These limits may be used to obtain ”bottom lock” on the depth when the echo sounder is pinging. The sounder needs this lock to locate the correct depth, and to stay on it during the operation, even though the depth changes continuously.

The dialogue box is also used to set alarms to notify you if maximum or minimum depths are exceeded.

Parameters

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.

Maximum Depth - The search for the bottom echo extends down to this depth whenever bottom track is lost. Enter 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.

Bottom Lost Warning - A warning is activated whenever bottom track is lost. The warning is presented as a message in the **Status bar** and as an audio signal.

Min. Depth Alarm - An alarm is activated whenever the detected bottom depth is smaller than the chosen alarm threshold. The warning is presented as a pop-up message and as an audio signal. When the depth value is set to 0, this function is disabled.

Max. Depth Alarm - An alarm is activated whenever the detected bottom depth exceeds the alarm threshold The warning is presented as a message on the display and as an audio signal. When the depth value is set to 0, this function is disabled.

Backstep Min. Level - After the estimated depth of the bottom detector, the detected depth is automatically adjusted by stepping back according to the value of the setting you have chosen. This allows the ES60 to verify that the correct bottom depth has been located. If the value you enter is too large (close to 0 dB) the adjustments will be very small.

The default value is -50 dB.

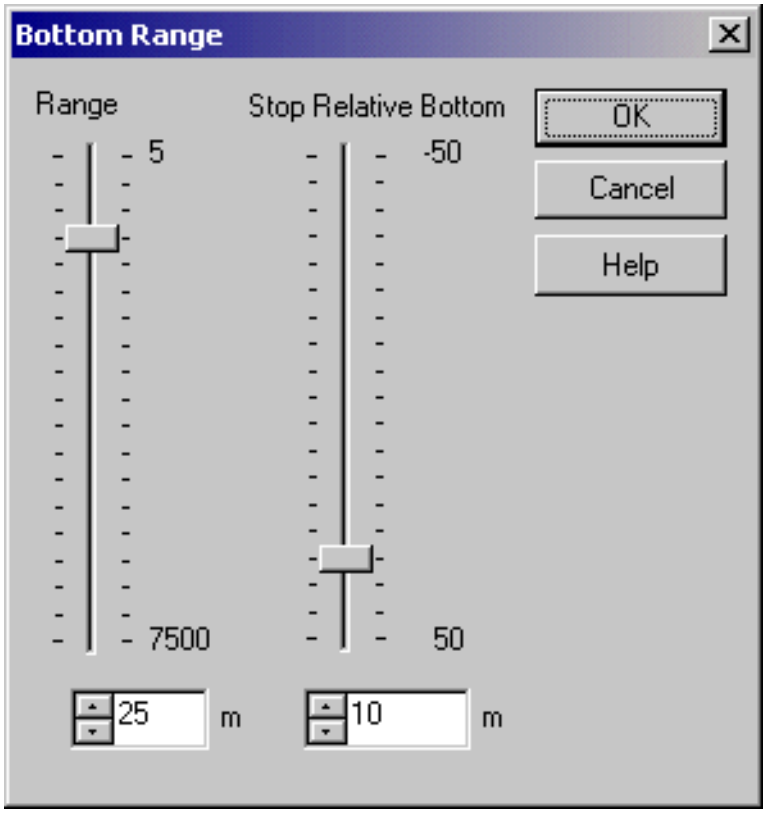
Bottom Smoothing - If bottom track is lost, the detected bottom depth is repeated for a maximum of three consecutive pings.

Alternative Bottom Detector - This bottom detector resembles the Simrad ES 380 bottom detector algorithm. This function may be useful in a steep bottom slope situation.

Bottom Range

The **Bottom Range** dialogue box opens if you click the right mouse button in the range field in the **Echogram and Range** view while operating with a **Bottom Range** echogram.

The different echograms are explained in the **Echogram** dialogue box.



Range - This parameter controls the vertical depth range across the echogram.

Stop Relative Bottom - This parameter controls the depth offset at the lower boundary of the echogram relative to the detected bottom; positive values downwards.

Note that you can also change the range using the mouse wheel. This is described in the *Echo frames* chapter.

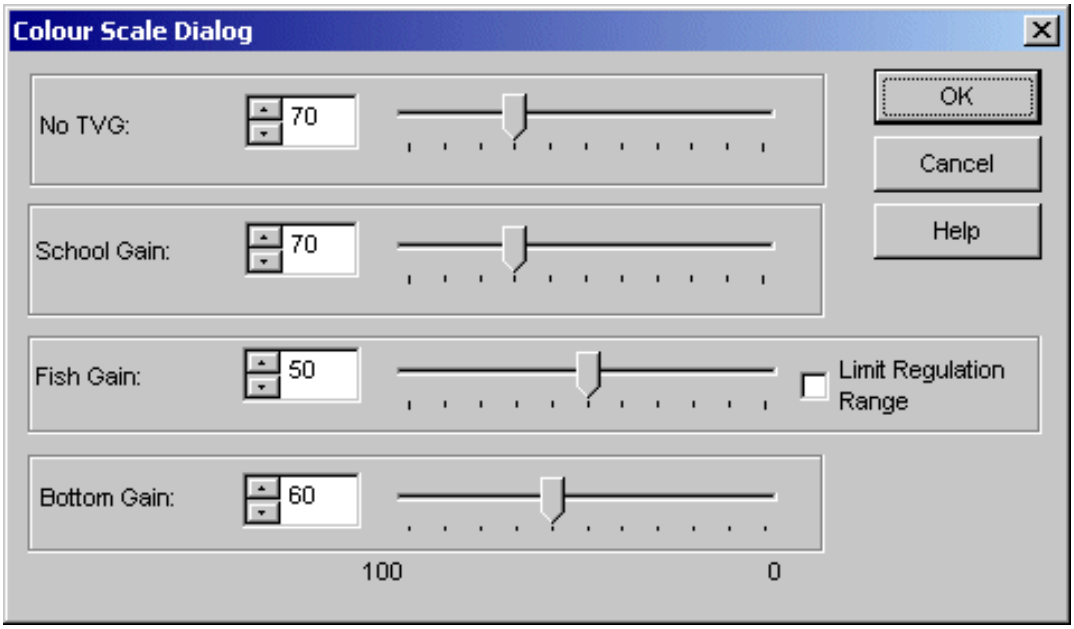
Related topics

→ *Echogram, page 85*

Colour Scale

The **Colour Scale** dialogue box is opened when you right-click on the colour scale in the **Header** view.

This dialogue controls the mapping of echo strength into one out of 12 colours, light blue for weak signals and dark brown for strong signals. Each discrete colour represents a 3 dB range of echo signal strength implying that the next colour is selected every time the echo strength doubles.



Parameters

A high numeric value displays weak echo signals properly while the stronger signals saturate into dark brown colour. 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).

School Gain - This parameter controls the display sensitivity of the echo sounder down to the detected bottom depth when **School Gain** is selected in the **Echogram** dialogue box. A numeric value of **70** sets the lower limit of the echogram colour scale equal to a volume backscattering strength of -70 dB.

Fish Gain - This parameter controls the display sensitivity of the echo sounder down to the detected bottom depth when **Fish Gain** is selected in the **Echogram** dialogue box. A numeric value of **50** sets the lower limit of the echogram colour scale equal to a target strength of -50 dB**.**

Limit gain regulation - Due to the high dynamic range in the ES60 echo sounder, invidious gain settings may result in unwanted noise. This will also cause the fish size estimates to be erroneous. This gain regulation setting will limit the receiver gain to maximum 100 dB. The limitation will prevent the echo sounder from saturation.

Bottom Gain - This parameter controls the display sensitivity of the echo sounder below the detected bottom depth. A numeric value of **70** sets the lower limit of the echogram colour scale equal to a surface backscattering strength of -70 dB.

No TVG - This parameter controls the display sensitivity of the echo sounder when **No TVG** is selected in the **Echogram** dialogue box. A numeric value of **70** sets the lower limit of the echogram colour scale equal to a measured input level of -70 dB.

Removing colours

By left-clicking on the colours in the colour rectangle in the upper right-hand corner of the screen, the selected colour will become the weakest colour shown in the **Echogram** and **Single Echo** views.

To restore the colour range, click on the removed colour's position.

Note that this is a display function only. It does not have any effect on the sounder's performance. It will however affect the recordings made by the **History** function.

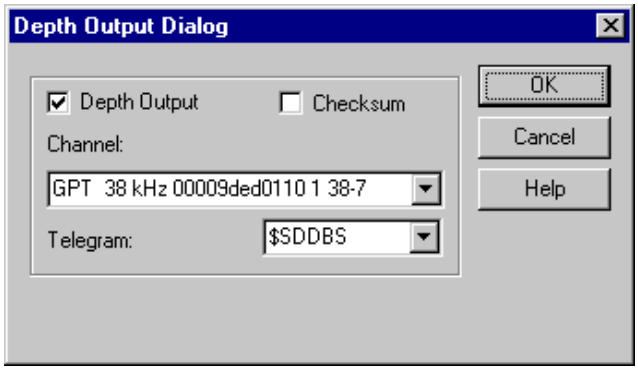
Related topics

→ *Echogram, page 85*

Depth Output

The **Depth Output** dialogue box is called from the **Heave Sensor**, **Trawl Interface** and **Navigation Interface** dialogue boxes. These are in turn accessed from the **Install** menu.

It allows you to control the depth data output.



Parameters

Depth output - Check to enable the depth output.

Checksum - A checksum may optionally be appended to the NMEA output telegrams (according to the NMEA standard).

Channel - NMEA depth telegrams are only output from one channel at a time. Select channel from the list of installed frequency channels.

The GPT uses its Ethernet address for unique identification, and the PCT uses its ISA bus parameters; IO address, DMA channel and IRQ number. The channel number identifies individual channels within a multi-channel transceiver.

Telegram - The echo sounder can output three different types of NMEA depth telegrams. However, only one telegram type at a time can be generated. You can select the telegram type here.

- The **$SDDBS** telegram contains the depth below the surface.
- The **$SDDBT** telegram contains the depth below the transducer.
- The **$SDDPT** telegram contains the depth below the transducer and the distance between the transducer and the waterline.

The ES60 can also output the **EA 500/EK500** compatible depth telegrams; D1, D2 etc. Output for Atlas echo sounders are also provided.

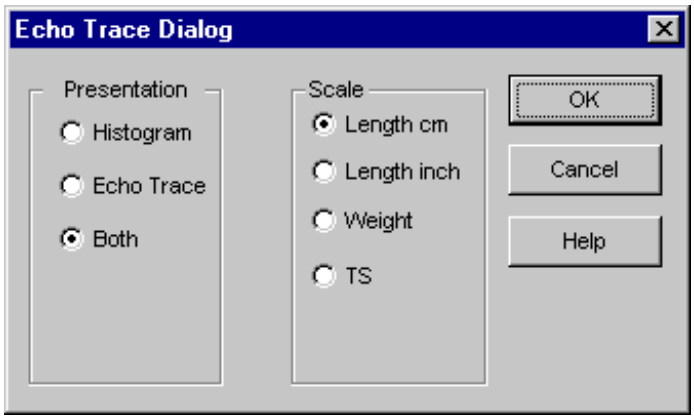
Related topics

→ *Trawl Interface, page 122*
→ *Heace Sensor, page 93*
→ *Navigation Interface, page 100*

Echo Trace

The **Echo Trace** dialogue box is opened if you right-click in the **Single Echo** view on the display.

For each detection of a single fish the ES60 estimates the target strength. Approximate formulas are used to convert target strength to fish length and weight. Cod and other species with a swim bladder are assumed. The statistical distribution of fish size and the position of the fish inside the transducer beam are plotted. These plots include fish detected within the vertical depth range of the associated echogram. The size plot, the position plot and the echogram use identical colour scale.



Presentation

Histogram - The frequency distribution of fish size is plotted; 12 size cells, 3 dB per cell. Total range plotted is 36 dB. Smaller fish and larger fish are disregarded.

Echo trace - The position of the fish inside the transducer beam is plotted. Only the three strongest detections are shown. A circle shows the 6 dB beamwidth of the transducer.

Both - Fish size distribution and fish position are both plotted.

Scale

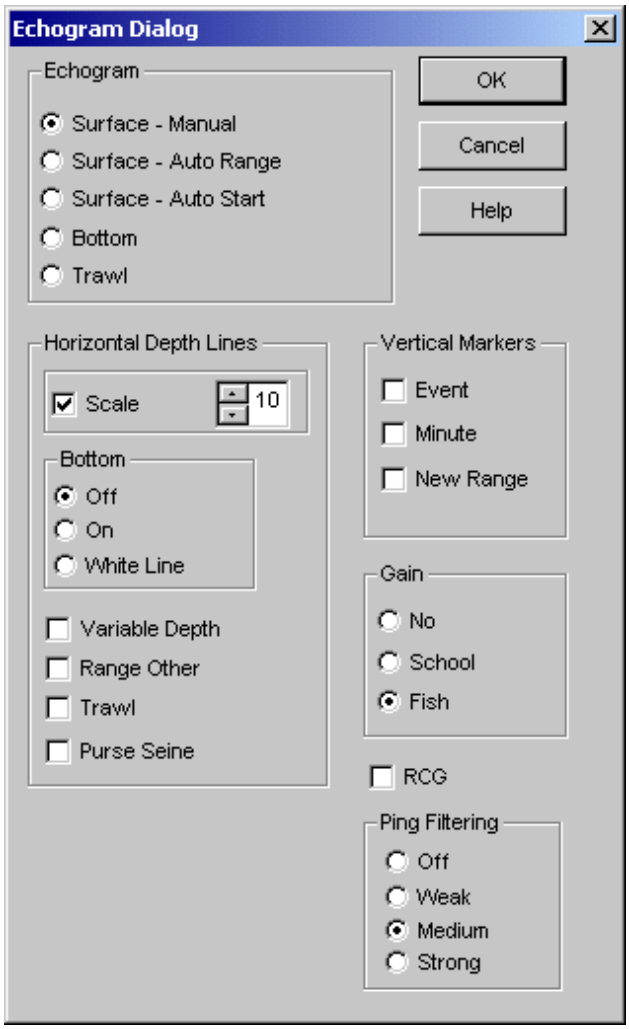
Length - The unit along the horizontal axis of the size distribution histogram is fish length in centimeters or inches.

Weight - The unit along the horizontal axis of the size distribution histogram is fish weight in kg.

TS - The unit along the horizontal axis of the size distribution histogram is target strength in dB.

Echogram

The **Echogram** dialogue box is opened by right-clicking on the echogram in the **Echogram and Range** view on the display. This dialogue is used to control the type and presentation of the echograms.



Echogram

Surface - Manual - The echogram is related to the sea surface. Start depth (at the upper echogram boundary) and vertical range (across the echogram) are manually selected in the **Surface Range** dialogue box.

Surface - Auto Range - The echogram is related to the sea surface. Start depth is manually selected in the **Surface Range** dialogue box. The ES60 performs automatic adjustment of the vertical range keeping the bottom echo inside the visible echogram.

Surface - Auto Start - The echogram is related to the sea surface. Vertical range is manually selected in the **Surface Range** dialogue box. The ES60 performs automatic adjustment of the start depth keeping the bottom echo inside the visible echogram.

Bottom - The echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected in the **Bottom Range** dialogue box. The echogram is only drawn for pings having a successful bottom detection.

Trawl - Trawl sensor systems communicate headrope depth and headrope-to-footrope distance to the ES60 at regular intervals. The echogram covers the vertical opening of the trawl including a small margin at each side. The headrope and footrope margins are identical. Their size is selected in the **Trawl Range** dialogue box. The headrope-to-footrope distance can be manually set in the **Trawl Interface** dialogue box for trawl sensor systems not measuring the trawl opening, or when the measured headrope-to-footrope distance is unreliable. The echogram is only drawn when trawl position information is available.

Port/starboard - Define if the current sidescan transducer is mounted on the port or starboard side of the vessel.

Range view - The echogram will display both the water column and the bottom. Valid for both single and dual systems.

Across view - If a vertical transducer is available, the bottom echogram will expand (hiding the water column). The extent of expansion (in metres) is set by the vertical depth. Valid for both single and dual systems.

Import - It is possible to display both port and starboard sidescan echograms in the same view. When opening the echogram dialogue for one transducer channel, select the other transducer channel to be imported in the drop-down list, then click the Import box. This function is only valid for dual systems.

Horizontal Depth Lines

Scale - Equidistant horizontal scale lines are drawn inside the echogram in the current foreground colour; black during day and white during night. A maximum of 50 scale lines can be drawn. No scale lines are drawn when the scale line count is set to zero.

Each echogram will be labeled with a number placed on the TX pulse in each channel.

Show echograms - In mode 1x to 5x the centre echograms can be chosen by selecting the transducer number in the waterfall view. Example: If 3x is chosen and echogram 5 is centre, the echograms 4 and 6 will be displayed in each side of echogram 5.

Bottom:

- **On -** The detected bottom depth is shown as a thin line in the echogram. The line is drawn in the current foreground colour; black during day and white during night.
- **Off -** The bottom line is switched off.
- **White Line -** A band in the current background colour is drawn below the detected bottom depth.

Variable Depth - When enabled a horizontal depth line is placed wherever you click in the **Echogram** view. The depth of the line is displayed at the left end of it. In the **History** diagram the depth for each ping is displayed individually.

Trawl - Headrope and footrope depth are indicated by two red lines in the echogram. Continuous lines are drawn when the current depth values are available, and dotted lines are drawn for a period of two minutes when this information is not available. No lines are drawn after two minutes.

Range other - Two horizontal lines indicate the range presented in the lower echo frame**.**

Purse Seine - The depth of the purse seine sensor is indicated.

Vertical Markers

Event - A vertical line is drawn when a new event is generated.

Minute - A short vertical line is drawn in the upper part of the echogram once every minute.

New Range - A vertical line is drawn when the range is changed. The old range is written on the screen as an annotation.

Gain

No - No TVG is applied. The echogram displays the input power level at the transducer terminals. This echogram type is used for special purposes when TVG is not applicable or required..

School - The echogram displays volume backscattering strength above the detected bottom, and surface backscattering strength below the detected bottom. Volume backscattering strength is suitable when observing a school of fish, and surface backscattering strength is suitable when studying the properties of the bottom.

Fish - The echogram displays target strength above the detected bottom and surface backscattering strength below the detected bottom. Target strength is suitable when observing individual fish, and surface backscattering strength is suitable when studying the properties of the bottom.

RCG (Reverberation Controlled Gain)

Apply this filter to enhance the detection of single fish on a background of reverberation or noise.

Ping Filter

The ping-to-ping filter ”cleans up” the echogram by removing random noise spikes with no correlation with the previous ping. The function will thus make echoes appear more stable.

The ping filtering effect may be varied using the three different settings provided, or it may be switched off.

Weak - Only two pings are correlated

Medium - Four pings are correlated

Strong - Eight pings are correlated.

Related topics

→ *Surface Range, page 115*

→ *Bottom Range, page 80*

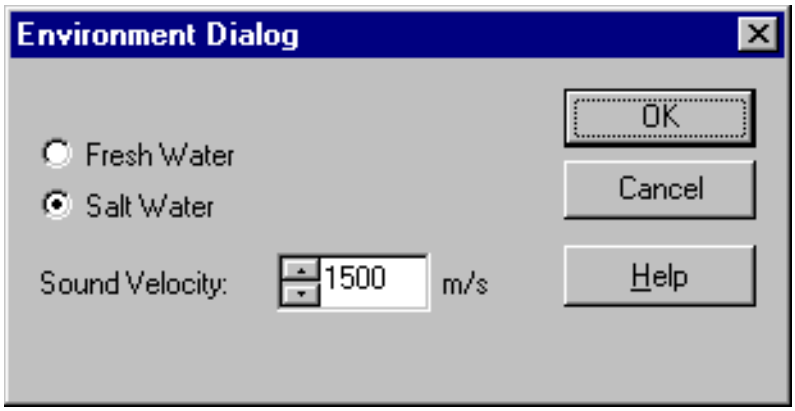
→ *Trawl Range, page 124*

→ *Trawl Interface, page 122*

Environment

The **Environment** dialogue box is available from the **Install** menu.

Many other echo sounders are calibrated to a sound velocity of 1500 m/s. If the ES60 is used together with other sounders it is advantageous to adjust the sound velocity on the ES60 as well, in order to have the same depth readings.



Salt Water / Fresh Water - Propagation losses due to absorption are much higher in sea water than in fresh water. Correct compensation for these losses therefore relies on the echo sounder knowing which water type is present.

Sound Velocity - For accurate measurement of bottom depth the correct sound velocity must be entered. Normally, 1470 m/s is a good average value.

Related topics

Shutdown

The **Shutdown** command is available from the **File** menu.

Select this command to terminate the echo sounder program.

Note

You must always use this command before you turn off power!

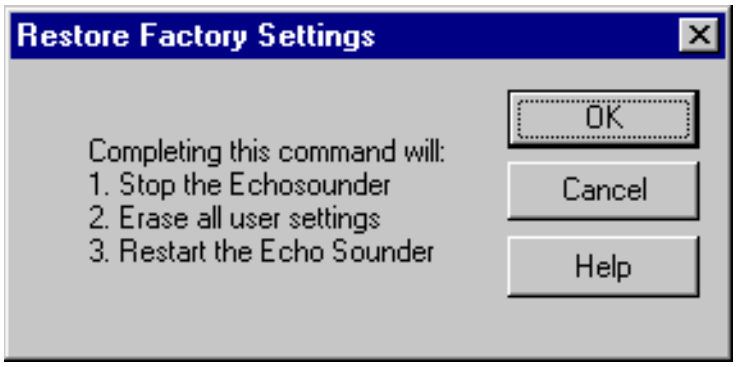
Related topics

→ *File, page 59*

Factory settings

The **Factory Settings** dialogue box is accessed from the **Options** menu. It does not provide specific parameters, but simply allows you to acknowledge the chosen function.

Restoring factory settings is normally used only if you need to restore the echo sounder after long time use, or if you have made a number of incorrect selections in the menus or dialogue boxes and wish to correct these fast.



When selected, this function will first stop the echo sounder operation.

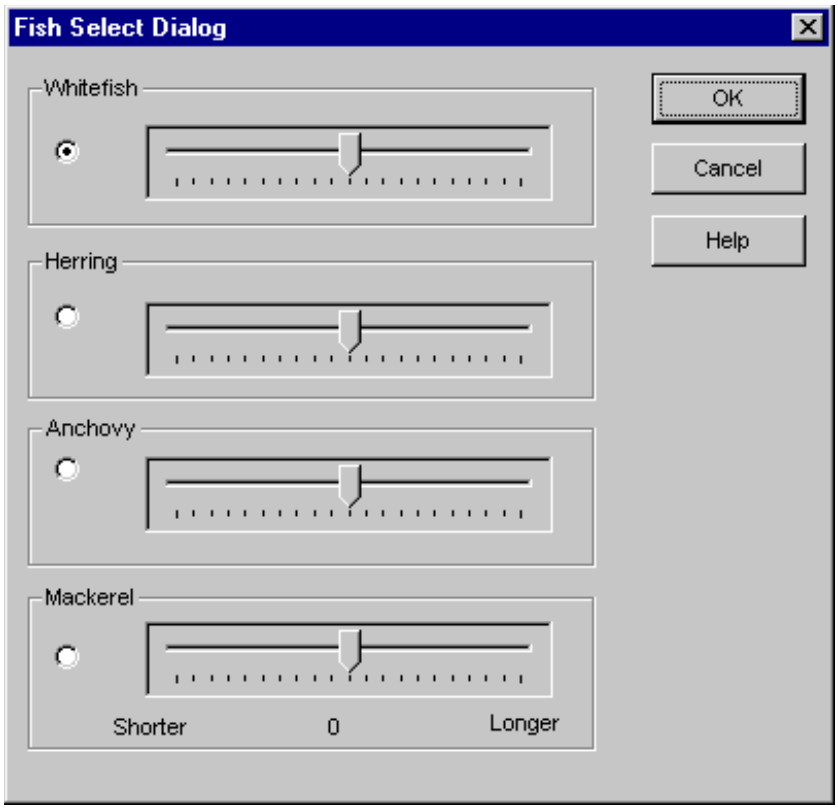
Second, all the personalized settings you have entered will be removed. These include all the parameters you have chosen for the operation, as well as changes you have made with the echo sounder screen layout. The settings made for communication (serial lines) and installation (transceivers and transducers) are not affected. The only way to restore the operational settings is to enter them all one more time.

Third, the echo sounder is restarted using the default settings chosen by Simrad Horten. These are considered generic, and they are the same settings as when you first switched on the echo sounder.

Fish select

The **Fish Select** dialogue box is accessed from the **Install** menu.

The settings in this dialogue box allows you to modify the fish size distribution manually. If the information in the **Single Echo** view appears to be inaccurate, or the information does not correspond with the actual catch, the values can be modified. Select the fish type you are catching or looking for, then adjust the size.



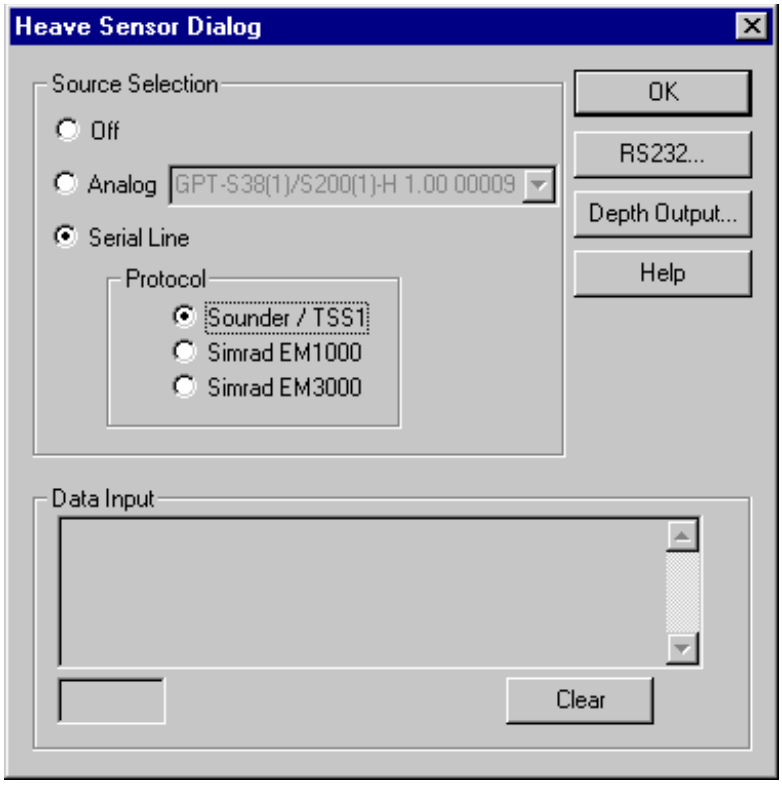
Related topics

→ *Fish size distribution, procedure, page 54*

Heave Sensor

The **Heave Sensor** dialogue box is accessed from the **Install** menu.

If you wish your echogram and detected bottom depth to be heave corrected, you need to connect the ES60 to a heave sensor.



Source Selection

Off - Disregard all heave input.

Analog - Heave sensors with analogue outputs are connected directly to the **Auxiliary Connector** of the nearest General Purpose Transceiver (GPT). Select the appropriate transceiver from the list of installed transceivers. Each entry in the list contains transceiver type, operating frequency and unique identifier.

The transceiver accepts a ±10V differential input signal. A fixed scaling factor equal to 1 V/m is programmed.

The GPT uses its Ethernet address for unique identification.

The PC Transceiver uses its ISA bus parameters; IO address, DMA channel and IRQ number.

The channel number identifies individual channels within a multi-channel transceiver.

Serial Line - Heave sensors with a serial line output are connected to a RS-232 port at the rear of the echo sounder's processor unit.

Protocol - These options are only available when **Serial Line** has been chosen. Use these to select serial line input format. The echo sounder recognises one character based telegram (Sounder/TSS1) and two binary telegrams (EM 1000 and EM 3000).

Data Input

The most recent input data is displayed in a list. With analogue input the input voltage and the computed heave value are displayed. With serial line input the telegram content is displayed. This function is useful during installation and trouble shooting. The current heave value is displayed in meters in the lower left corner of the dialogue box.

Clear - This button clears the input data list.

Depth Output

This opens the **Depth Output** dialogue box.

RS-232

This button activates the **RS-232 Setup** dialogue box. This box is used to define communication port, baud rate etc.

Related topics

→ *Depth Output, page 83*

→ *RS-232 Setup, page 112*

History

The **History** dialogue box is accessed from the **View** menu.

It displays echogram views previously saved during normal echo sounder operation. This function greatly reduces the need for echogram printout on paper. The presentation is made in a separate window, and the echo sounder operates normally in the background.

Note that the number of history files is limited to 400 in the same directory.

Echograms covering the past hours can be viewed by operating the scroll bar at the bottom of the dialogue; the oldest echogram view to the left, the newest echogram view to the right.

Click the button in the lower right corner if you wish to print the current view. If you wish to print a series of echograms click the button with the + sign.

The echograms stored in the history files are available on *.BMP format on the harddisk. A directory for these were created during the installation: **c:\ES60\history**.

Recording, browsing and printing the history information is described in the *Operational procedures* chapter. More detailed information about the History window is provided in the *Display views* chapter.

Related topics

→ *Operation, page 102*

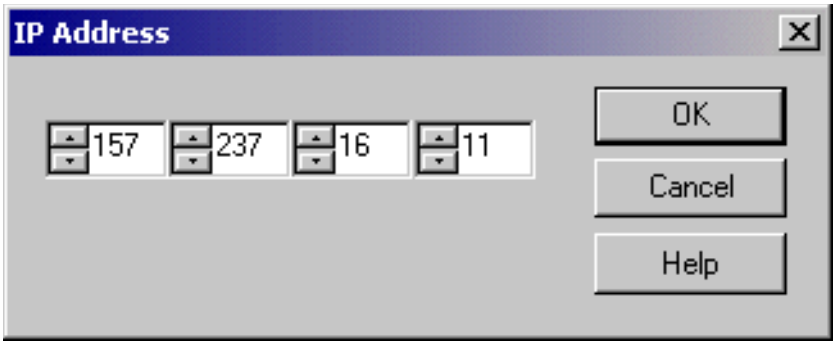
→ *History recording, page 48*

IP Address

The **IP Address** dialogue box is used when you need to change the echo sounder's addressing.

Note that this operation is not required on a daily basis. You only need to modify the address if your echo sounder system shall be connected to an existing computer network on the vessel. As long as the ES60 operates as a stand-alone system using the hardware supplied by Simrad Horten, you will not need to change anything.

To access this dialogue box, open the **Transceiver Installation** dialogue box from the **Install** menu, select a transceiver, and click **Set new GPT IP Address**. The echo sounder will stop automatically.



If you need to change the address, keep **157** and **237** as the two first bytes, as these are common for all Simrad Horten equipment. The two remaining digits can be chosen freely, provided that no other Simrad Horten equipment with the same address is connected to the same network. Thus, if you operate with more than one GPT, these must be set up with different IP addresses.

Background theory

IP addresses are shown as four decimal integer numbers, where each integer number corresponds to eight bits (or one byte) of the address.

An IP address consists of a *network* address and a *host* address. Three *address classes* are defined:

Class A used on large networks:

0NNNNNNN HHHHHHHH HHHHHHHH HHHHHHHH

Class B used on medium size networks:

10NNNNNN NNNNNNNN HHHHHHHH HHHHHHHH

Class C used on small networks:

11NNNNNN NNNNNNNN NNNNNNNN HHHHHHHH

The address class is determined from the high-order bits of the first byte.

- The first byte of a **Class A** address contains a zero and seven network bits. The next 24 bites identify the host.
- A **Class B** address contains a one, a zero, 14 network bits and 16 host bits.
- Finally, a **Class C** address contains a one, a one, 22 network bits and 8 host bits.

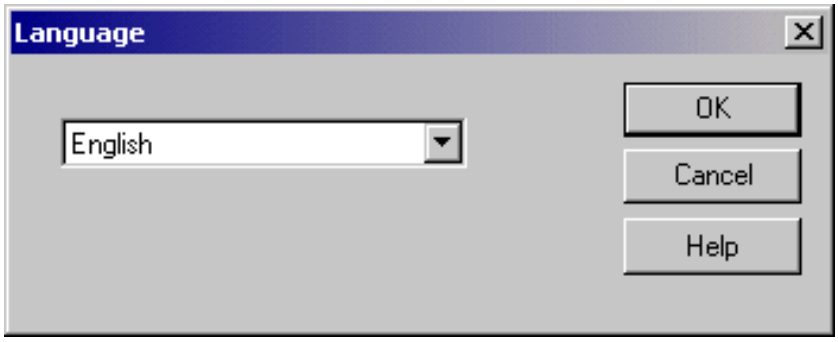
The echo sounder computer, GPT transceiver(s) and other computers that communicate on the Ethernet must reside on the same network. This requirement is met only if the host part of the address differs.

Related topics

→ *Transceiver Installation, page 117*

Language

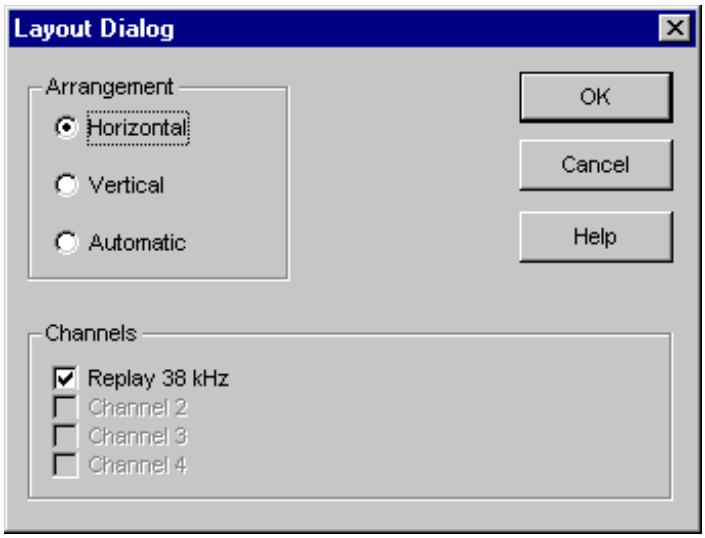
The **Language** dialogue box is accessed from the **Options** menu. Use this dialogue to select operational language.



Layout

The **Layout** dialogue box is accessed from the **View** menu.

Installed frequency channels are visible on the display or hidden. This dialogue box controls how many frequency channels are visible and their layout on the display.



Arrangement

Visible frequency channels are vertically or horizontally arranged on the display. **Automatic** selection of layout is also provided.

Channels

The list of installed frequency channels is displayed; one channel per line.

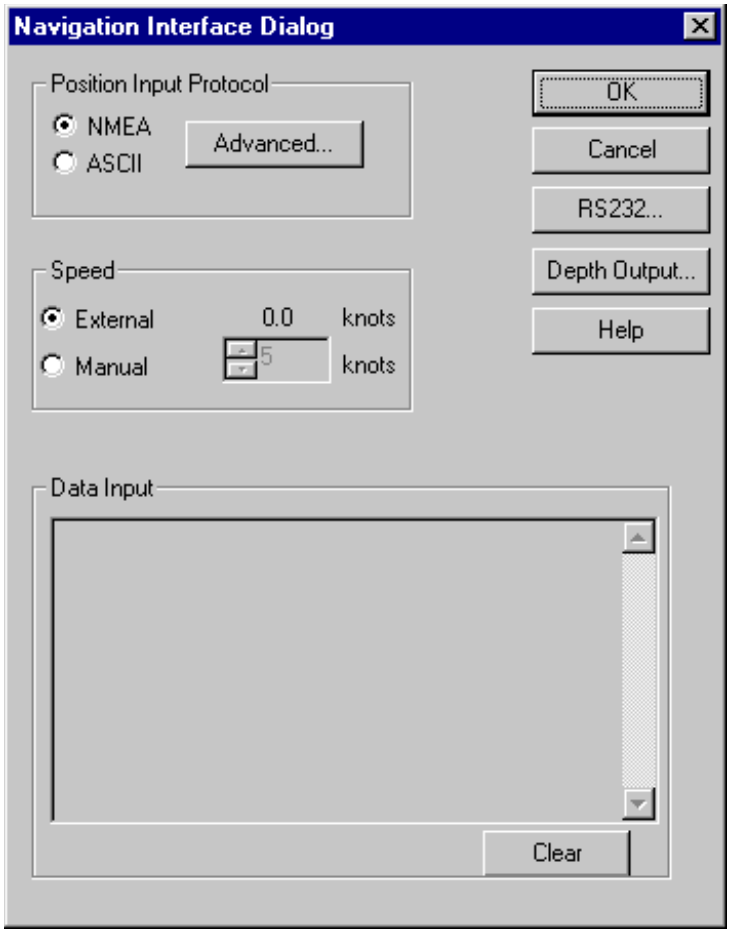
Each entry contains a check box, transceiver type, operating frequency, unique identifier, channel number and transducer type.

- The PC Transceiver uses its ISA bus parameters for unique identification; IO address, DMA channel and IRQ number.
- The General Purpose Transceiver (GPT) uses its Ethernet address. The channel number identifies individual channels within a multi-channel transceiver.

Select visibility by clicking the boxes.

Navigation Interface

The **Navigation Interface** dialogue box is accessed from the **Install** menu.



A navigation receiver or other navigational instrument can be connected to a RS-232 port of the ES60 Processor Unit. The input may be either standard NMEA datagrams or user specific ASCII datagrams. Standard NMEA datagrams are automatically interpreted, like the **GGA** and **GLL** navigation sentences.

Special **$??ATS** or CS datagrams (defined by Simrad Horten) may contain an external annotation message. See the **Annotation** dialogue box for further information about annotations.

Position input protocol

Tick for the appropriate input protocol; **ASCII** or **NMEA**. For setup of these protocols, see the **Advanced Navigation** dialogue box. This dialogue box is accessed with the **Advanced** button.

Speed input

External - to be used if navigational data is input from an external source into ES60. The current vessel speed value is shown (when external speed input is selected)

Manual - only to be used if external speed data is unavailable or unreliable.

Data Input

Data Input - The most recent input data are displayed in a list. This function is useful during installation and troubleshooting.

Clear - This button clears the list of input telegrams.

Depth Output

This opens the **Depth Output** dialogue box.

RS-232

This button activates the **RS-232 Setup** dialogue box. This box is used to define communication port, baud rate etc. The NMEA standard specifies 4800 bits per second, 8 bits per character, 1 stop bit, no parity.

Related topics

→ *Annotation, page 73*

→ *Advanced Navigation, page 69*

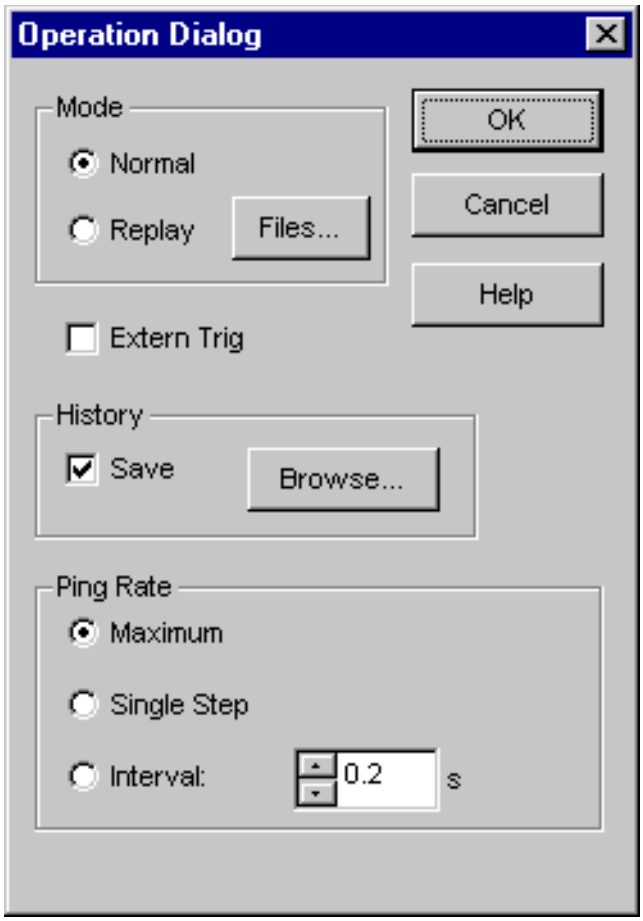
→ *Depth Output, page 83*

→ *RS-232, page 112*

Operation

The **Operation** dialogue box is accessed from the **File** menu.

This is the main dialogue box for operational control. You can select operational mode and ping rate, and you can initiate recording of the echo sounder information. The sounder has two functions to greatly reduce the need for echogram printout paper: **Store/Replay** and **History**.



The **Store/Replay** function records the unprocessed transceiver data on the internal harddisk. These data are later injected into the echo sounder processing software as if it arrived directly from the transducer. When replaying the recorded signal, you are free to experiment with the echo sounder settings.

This feature is useful during training and demonstration. It is also useful for memorising a particularly interesting observation out at the fishing grounds.

The **Store** dialogue box is available from the **File** menu. The **Replay** dialogue box is available from this dialogue box when you click on the **Files** button.

The **History** function is equivalent to the print function. The echo sounder continuously saves echogram ”printouts” or echogram pictures to the internal harddisk. These can later can be recalled on the display.

The horizontal width of each echogram picture roughly corresponds to the width of the display. History memory is organised as a circular loop; the newest echogram picture overwrites the oldest one. The circular memory holds several hours of echogram recording. The history function allows you to quickly look through echogram pictures covering the past hours.

Mode

The echo sounder either pings normally displaying the echo signal received at the transducer, or it replays a previously recorded echo signal stored in one of the four Raw Data Memory locations.

Normal - Click the **Normal** button to enter Normal ping mode.

Replay - Select **Replay** for Replay (playback) mode.

Files - When selecting **Replay** mode, click the **Files** button to activate the **Replay** dialogue to select the replay file.

External trigger

The **Auxiliary** connector on the General Purpose Transceiver (GPT) includes a trigger input signal for transmit synchronisation with external equipment. Normally, the ES60 transmits as soon as it is ready for the next ping. Transmission is delayed until a pulse is detected at the trigger input line when the **Extern Trig** entry is checked.

Click this option to enable the ES60 to work in Slave mode. The echo sounder will then await the external trigger from the peripheral system, and the transmissions from the systems will be synchronized.

When this option is not checked, the ES60 operates normally as a Master system.

The external triggering system is explained in more detail in the ES60 instruction manual. Refer to the *Cable layout* chapter in the printed book.

Note

External transmit synchronisation is only active in Normal ping mode.

History

Echogram pictures are saved continuously to the harddisk when the **Save** box is checked.

To select folder for the saved files, click **Browse**.

Ping rate

These settings are used to define how fast the echo sounder shall transmit ("ping"). When the **Maximum** box is selected, the ES60 transmits at maximum speed only limited by the speed of sound in water and/or processing delays.

Selecting **Single Step** allows the ES60 to conduct just one ping cycle every time the **Step!** entry on the **Main** menu is clicked, or the keyboard combination Alt+E is pressed.

Selecting **Interval** sets the echo sounder to transmit once at every chosen time interval (in seconds).

Related topics

→ *Store, page 113*

→ *Replay, page 110*

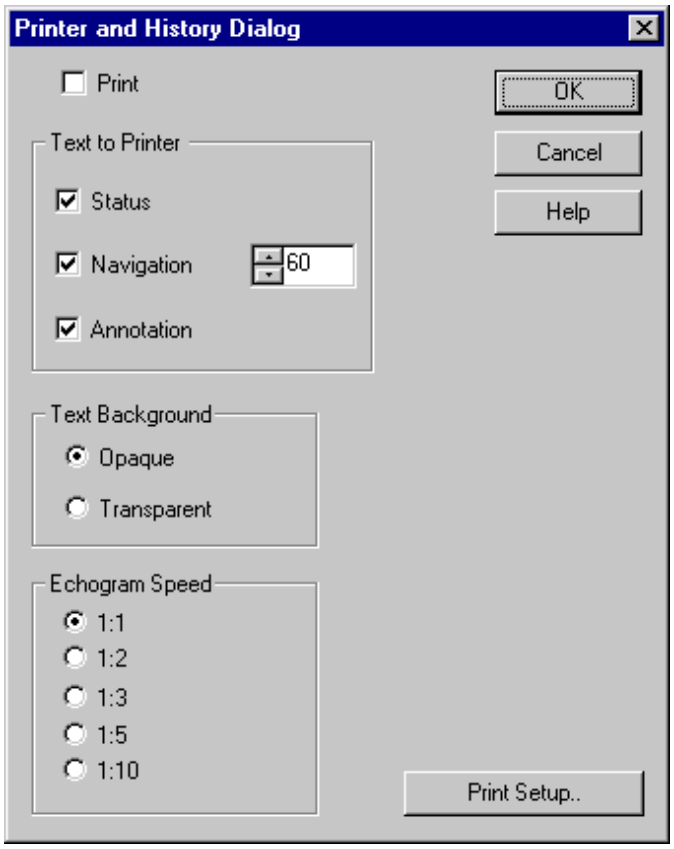
→ *Playback and recording procedure, page 46*

→ *History procedure, page 48*

Printer and History

The **Printer and History** dialogue box allows you to control the output to the system's colour printer.

The dialogue is accessed by the **Print** command on the **File** menu.



Print

Check this box if you want the echogram printing to be active. If the printer is switched on and active, a small printer symbol is shown inside the **Status bar**.

Text to Printer

Status - Check this box if you want status messages to be printed.

Navigation - Check this box if you want position strings to be printed. Navigation receivers typically output a new position fix every second, and it is not practical to print them all on top of the echogram. The count parameter in the spin box reduces the rate of printing of the position strings. Every tenth position fix is printed when this parameter is set to ten.

Annotation - Check this box if you want annotations to be printed.

Text background

Click to select either opaque or transparent text background on the annotation printouts.

Echogram speed

Select any of these values to slow down the printout relative to the echo sounder speed. The ping rate will not be changed.

Print Setup

Click this button to access the **Print Setup** dialogue box.

Related topics

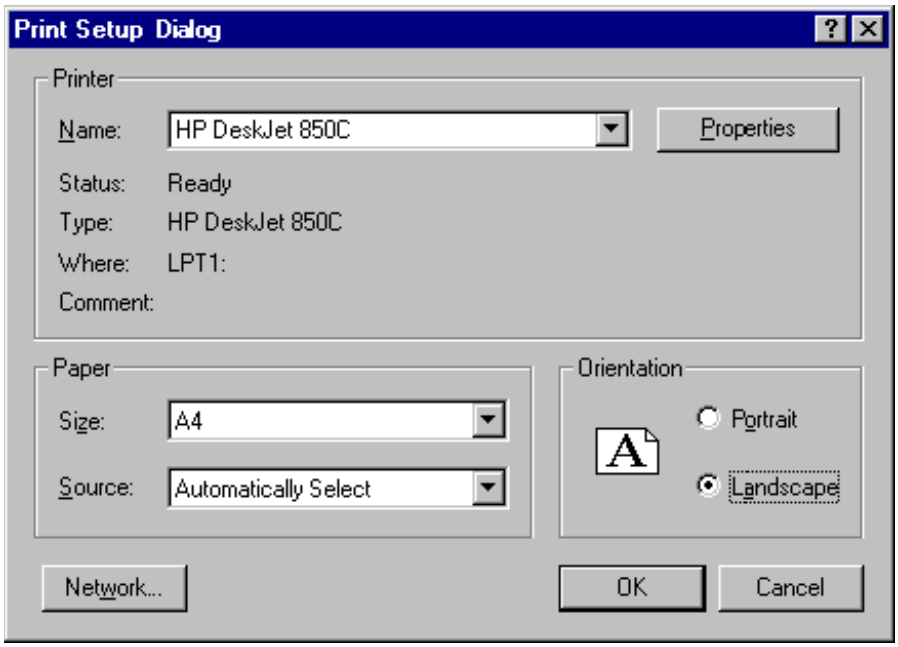
→ *Annotations, page 73*

→ *Print Setup, page 107*

Print Setup

The **Print Setup** dialogue box is accessed from the **Printer and History** dialogue box. Note that this dialogue box is a part of the operating system, and the language displayed is that of the operating system.

The ES60 echo sounder uses the print mechanism of the Microsoft™ operating system when sending the echogram to a printer. Virtually any modern printer can be used. This **Print Setup** dialogue box controls the printing process. Installation of a new printer is done with the operating system's built-in dialogue boxes. This is not described in this documentation. Refer to the operating system's documentation.



Printer

Name - This entry displays the logical name of the printer. A typical ES60 will normally have only one printer installed. However, if you for some reason have more than one printer installed, the **Name** box controls which printer to use.

Status - This field displays the status of the printer: ready, busy etc.

Type - The type of printer is displayed.

Where - The name of the interface to the printer is displayed.

Comment - Any comment that was entered during the installation of the printer appears here.

Properties - This button activates the **Properties** dialogue box. This is a printer specific dialogue for entering special purpose printer parameters. You do not need to enter this dialogue box during normal operation of the echo sounder. The **Properties** dialogue box is part of the operating system. For further information about this dialogue box, refer to the operating system documentation.

Paper

Size - Modern printers support a variety of paper sizes. However, the sizes A4 or Letter are appropriate when printing echogram on paper.

Source - This setting tells advanced printers which paper tray to use. The setting **Automatic Select** works on most printers.

Orientation

Select **Portrait** or **Landscape**. Landscape orientation is recommended for echogram printing.

Network

This button activates the **Network** dialog box. It is used to send print jobs to a remote printer on a data network. Clearly, this is not the situation on a standard fishing vessel. Hence, during normal operation you do not need to enter this dialog box.

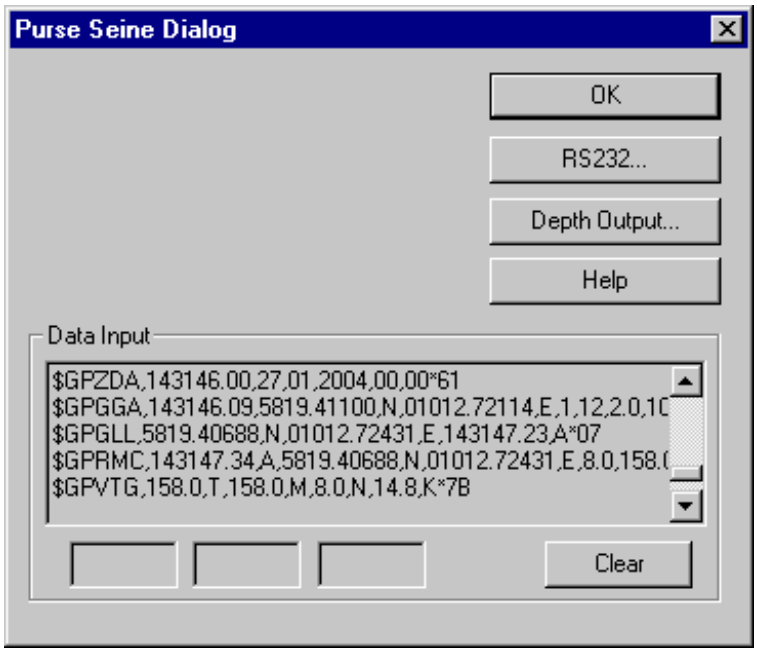
The **Network** dialogue box is part of the operating system. For further information about this dialogue box, refer to the operating system documentation.

Related topics

→ *Printer and History, page 105*

Purse Seine

The **Purse Seine** dialogue box is accessed from the **Install** menu. Use the settings from this dialogue to set up the interface to the purse seine system.



Depth Output

This opens the **Depth Output** dialogue box.

RS-232

This button activates the **RS-232 Setup** dialogue box. This box is used to define the communication port used to interface the purse seine system. You need to know the communication parameters to set this up. The NMEA standard specifies 4800 bits per second, 8 bits per character, 1 stop bit, no parity. You must check to the purse seine documentation if these settings do not work.

Data input

This is a text field where you can monitor the data telegrams received from the purse seine system. The information will scroll through the field. The purpose of this is only to confirm that the communication is working properly. To clear the field, press the **Clear** button.

Related topics

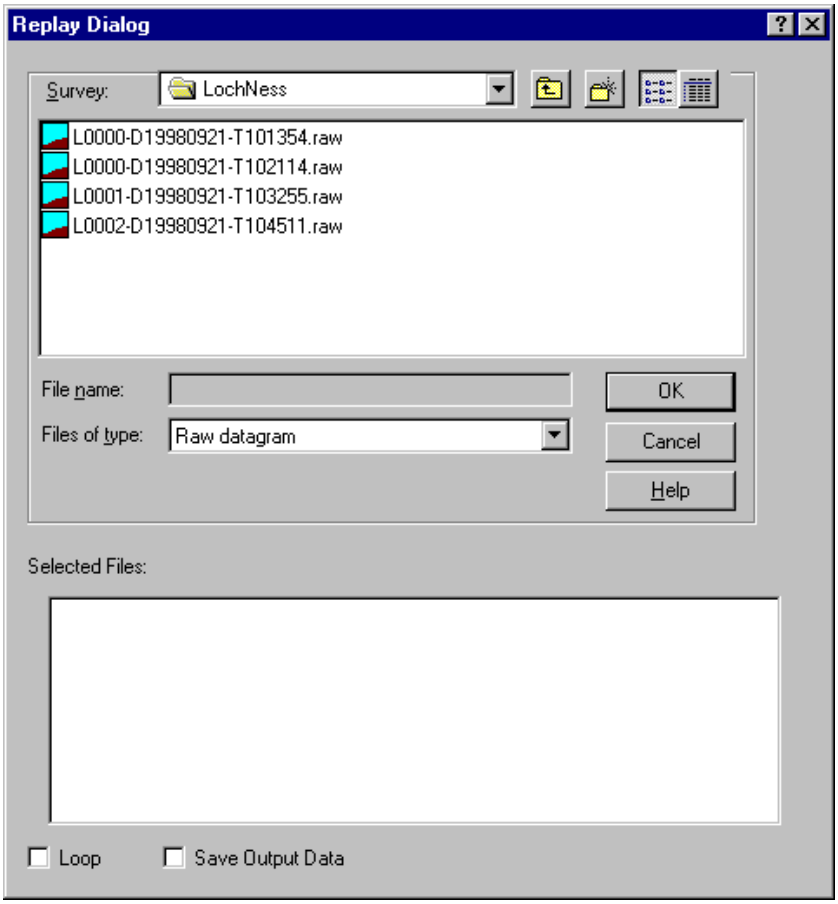
→ *Depth Output, page 83*

→ *RS-232 Setup, page 112*

Replay

This **Replay** dialogue box is accessed from the **Operation** dialogue box by clicking on the **Files** button. The **Operation** dialogue is in turn opened on the **File** menu.

The **Store** function records the unprocessed transducer signal on the internal harddisk or an other recordable media. The recorded signal can later be injected into the echo sounder processing software as if it arrived directly from the transceiver (Replay).



The **Store** dialogue box (also available from the **File** menu) controls the recording of the unprocessed signal on the harddisk, while this **Replay** dialogue controls the playback of this signal into the echo sounder processing software.

Survey (directory)

This is a standard file selector. Select survey directory first, and then one or more files to be replayed.

Selected Files

The currently selected files are displayed in this field.

Loop

Check this box if you want the ES60 program to loop through the currently selected replay files without stopping.

Save Output Data

Check this box if you want to store processed output data. This data are used by post-processing software when generating bottom contour maps.

In this version it is not posible to store **.out** and **.dg** files to harddisk.

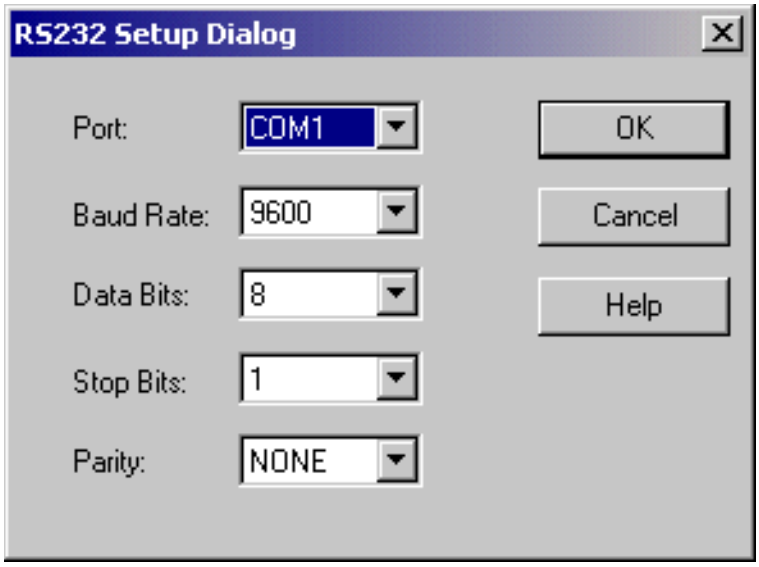
Related topics

→ *Store, page 113*

→ *Playback and recording procedure, page 46*

RS-232 Setup

The **RS-232 Setup** dialogue box is accessed from several other dialogue boxes. It specifies the RS-232 communication settings. Identical settings must be used at the opposite side of the RS-232 cable.



Parameters

Port - Which RS-232 port do you want to use?

Baud Rate - Select communication rate.

Data Bits - Do you want to use 7 or 8 data bits per character? Eight data bits per character are standard.

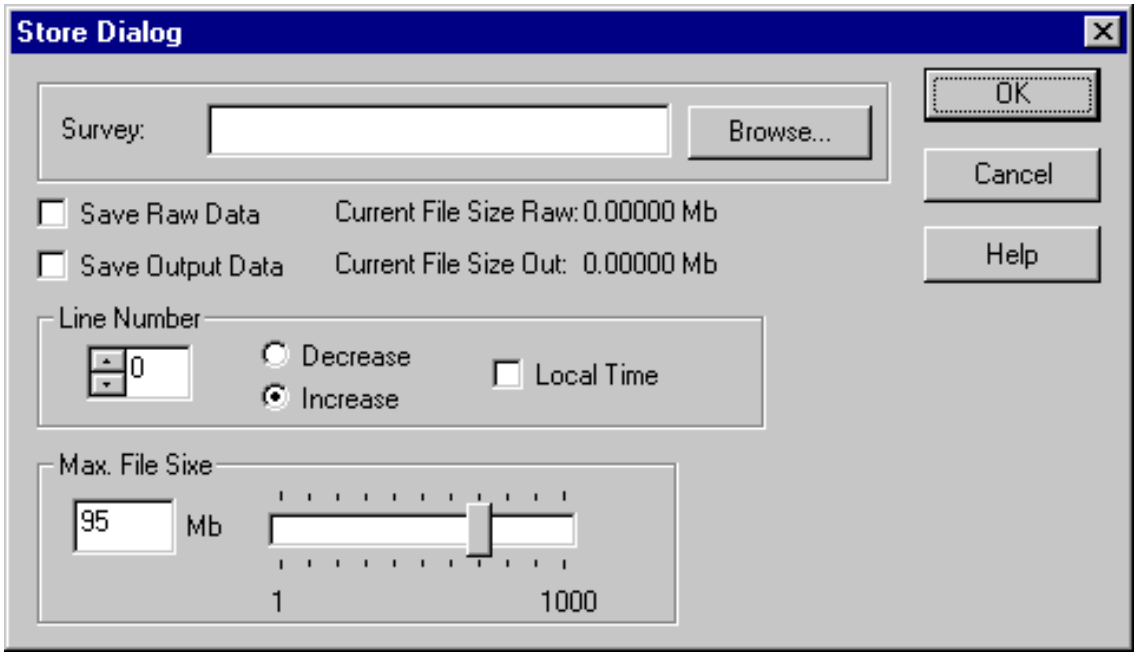
Stop Bits - One or two stop bits?

Parity - Do you want to use bit 8 for error checking?

Store

The **Store/Replay** function records the unprocessed transceiver data on the internal harddisk. The recorded signal can later be injected into the echo sounder processing software as if it arrived directly from the transducer.

The **Store** dialogue is accessed from the **File** menu. It controls the recording of the unprocessed signal on the harddisk. The **Replay** dialogue box (available from the **Operation** dialogue box) controls the playback of this signal into the echo sounder processing software.



Survey

Enter the complete path name of the survey directory. A new directory is created if it does not exist. The new directory is created when you click the **OK** button. Click the **Browse** button if you wish to navigate through the disk directories.

Data formats

Save Raw Data - Check this box to save the unprocessed transceiver data on the internal harddisk. The unprocessed transceiver data is stored in standard computer files. These files contain all the necessary data for realistically reconstructing the situation during the real survey; transceiver data, navigation data, annotation input etc. The echo sounder program reads these files during replay.

Save Output Data - Check this box if you wante to store processed output data on the internal harddisk; position fixes, bottom detections, annotations. This data are used by the post-processing software when generating bottom contour maps.

Line No.

Enter the initial survey line number. A toggle button inside the **Status bar** on the display controls the start and stop of each survey line. The line number is automatically incremented (or decremented) by one for every new survey line. Click the box and local time will be used in the file names, otherwise GMT is used.

Max File Size

Enter the maximum size of each replay file. The replay file contains the unprocessed transceiver data. Several kilobytes of sample data is written into this file every ping. All sample data may be contained in just one file for short survey lines. However, the amount of data grows rapidly as the survey lines become longer, and it may be necessary to split the data into fragments which are stored in sequential replay files.

Related topics

→ *Operation, page 102*

→ *Replay, page 110*

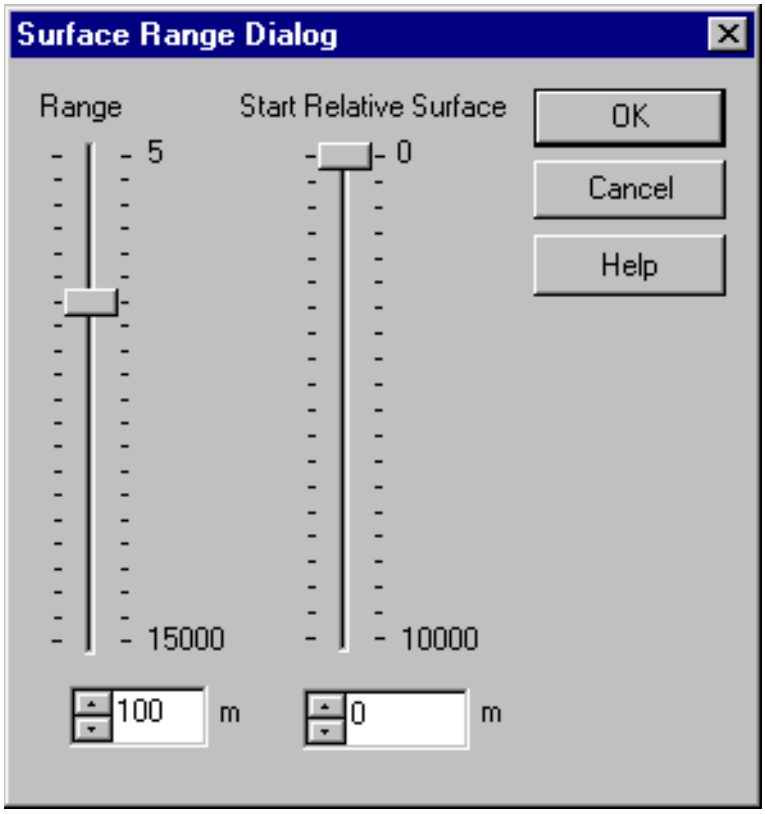
→ *Playback and recording procedure, page 46*

→ *Size control, page 47*

Surface Range

The **Surface Range** dialogue box opens if you click the right mouse button in the range field in the **Echogram and Range** view while operating with a **Surface Range** echogram.

The different echograms are explained in the **Echogram** dialogue box.



Parameters

Range - This parameter controls the vertical depth range across the echogram.

Start Relative Surface - This parameter controls the depth at the upper boundary of the echogram, relative the transducer face.

Note that you can also change the range using the mouse wheel. This is described in the *Echo frames* chapter.

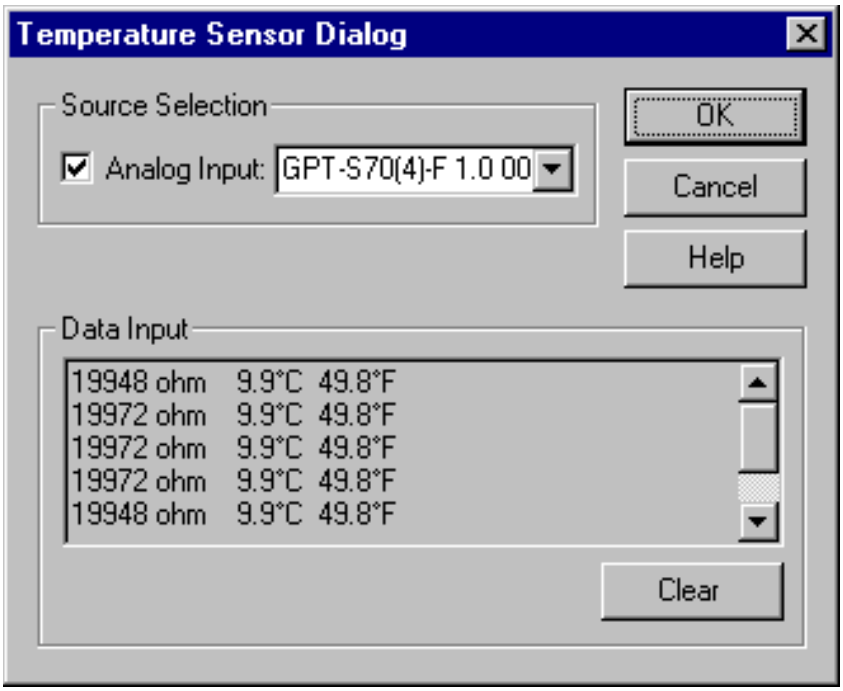
Related topics

→ *Echogram, page 85*

Temperature Sensor

The **Temperature Sensor** dialogue box is accessed from the **Install** menu. Water temperature is shown on the echo sounder display provided a thermistor (temperature sensitive resistor, 10 kohm at 25 deg C) is interfaced to the system.

The thermistor wires are connected directly to the **Auxiliary** connector of the nearest transceiver.



Analog Input - Select the appropriate transceiver from the list of installed transceivers. Each entry in the list contains transceiver type, operating frequency, unique identifier, channel number and transducer type. The GPT uses its Ethernet address for unique identification.

Data Input - The most recent input data are displayed in a list. Measured thermistor resistance and the computed temperature value are displayed. This function is useful during installation and troubleshooting.

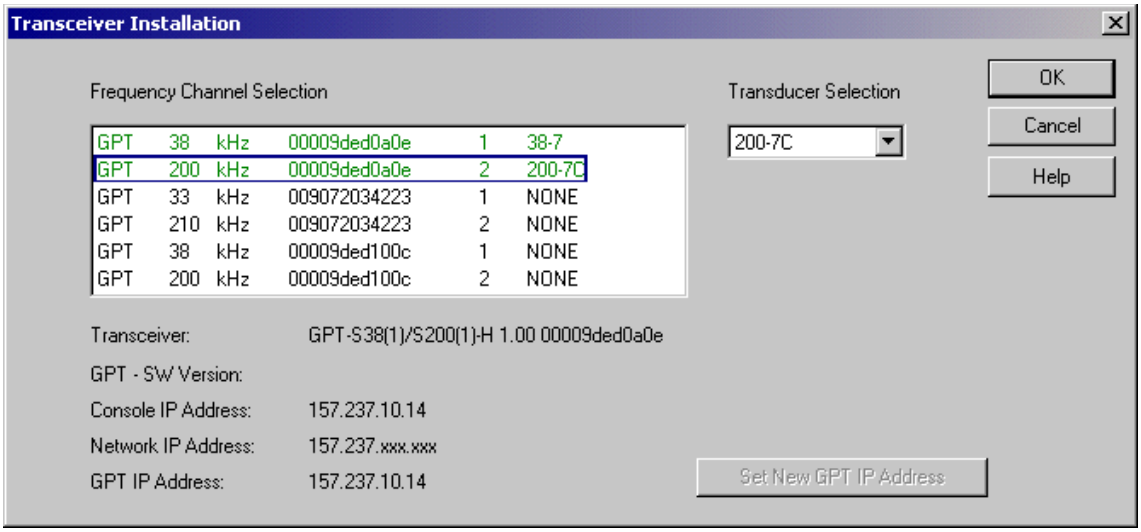
Clear - This button clears the input data list.

Transceiver Installation

This dialogue box controls installation and un-installation of transceivers. The dialogue box is accessed from the **Install** menu. Prior to this, all echo sounder activity must be stopped. When accessed, an opening dialogue allows you to either:

- **Inspect** the transceiver installations
- **Modify** the transceiver installations
- **Cancel** the operation

Every time the **Transceiver Installation** dialogue appears on the display the echo sounder software performs a search for transceivers. The ISA bus is searched for PC Transceiver plug-in boards, while General Purpose Transceivers (GPT) connected to the Ethernet interface are identified. The complete transceiver list is then displayed.



Transceiver list

A single frequency transceiver occupies one entry in the list, and a dual frequency transceiver occupies two. Each entry contains:

- Transceiver type
- Operating frequency
- Unique identifier
- Frequency channel number
- Transducer type

The General Purpose Transceivers use their Ethernet addresses for unique identification.

The PC Transceivers use their ISA bus parameters; IO address, DMA channel and IRQ number for identification.

The frequency channel number identifies individual channels within a multi-frequency channel transceiver.

Frequency channels

Hence, the echo sounder system consists of a number of frequency channels. Entries in the frequency channel list are shown in **black**, **green** or **red** colour. Detected channels that are not installed are shown in **black**. The phrase NONE replaces the transducer type name for uninstalled channels. Detected channels that are installed are shown in green colour. Installed channels that were not detected during the search for transceivers are shown in red colour.

Each entry in the **Frequency Channel Selection** list belongs to a transceiver. The lower part of this dialogue box displays information about the currently selected transceiver. The first information line displays the transceiver personality string. Remaining lines display specific transceiver information.

Set new GPT IP Address

The communication on the Ethernet network between the echo sounder computer and the General Purpose Transceiver(s) complies to the TCP/IP (Transport Control Protocol / Internet Protocol) family of protocols. Every host (GPT or computer) connected to the network must have a unique 32-bit IP address.

To modify the GPT IP address, refer to the **IP Address** dialogue box.

Related topics

→ *To install or uninstall a channel, page 44*

→ *To modify an IP Address, page 45*

→ *IP Address, page 96*

Transceiver Settings

The **Transceiver Settings** dialogue box is accessed from the **Header** view on the display. Place the cursor on top of the mode and frequency information, and press the right mouse button.

This dialogue box controls transceiver and transducer parameters specific to the current frequency channel.

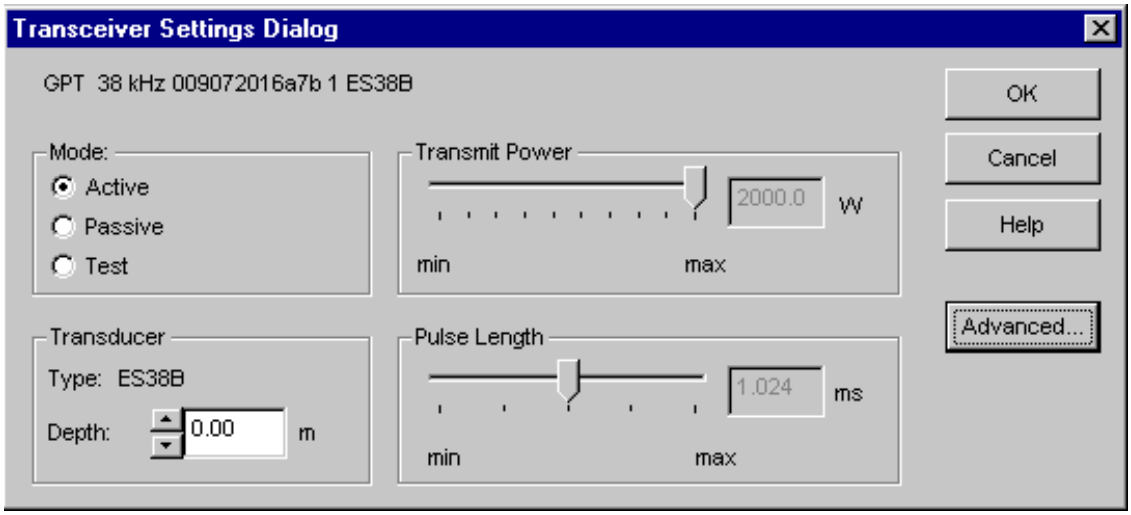
A text line at the top of the dialogue box identifies the frequency channel. This identification line contains:

- Transceiver type
- Operating frequency
- Unique identifier
- Channel number
- Transducer type

The PC Transceiver uses its ISA bus parameters; IO address, DMA channel and IRQ number for unique identification.

The channel number identifies individual channels within a multi-frequency channel transceiver.

A second text line appears in replay mode. This identifies the name of the replay file.



Mode

Active - The transmitter and receiver are active (normal operation).

Passive - The transmitter is passive while the receiver is active. This mode of operation is useful for test purposes, and when you wish to measure the ambient background noise in the sea.

Test - The transmitter is passive and the receiver is active. Each General Purpose Transceiver board includes a signal generator injecting a weak test signal (-70.0 dBW) into the receiver's input circuitry. The nominal power reading at the display is -70.0 dBW for channels using one transceiver board (1 kW single beam) and -64.0 dBW for channels using four boards (4 kW single beam, 4 kW split beam).

The PC Transceiver does not include any test generator, and there is no difference between the Test and the Passive settings.

Transmit Power

This parameter controls the transmitter's output power. Output power is limited either to the maximum rating of the transducer, or the maximum rating of the transmitter, whichever is the smallest.

Pulse Length

This parameter controls the duration of the transmit pulse.

The table below shows the pulse lengths (given in μS) available for the different operational frequencies.

-	64	128	256	512	1024	2048	4096	8192	16384
38 kHz			X	X	X	X	X		
50 kHz		X	X	X	X	X			
70 kHz		X	X	X	X	X			
120 kHz	X	X	X	X	X				
200 kHz	X	X	X	X	X				

Table 1 X-axis is pulse length in μS, Y-axis is frequency in kHz. "x" means that the pulse length is available for the given frequency.

Transducer

Type - The transducer currently connected to the transceiver is identified.

Depth - In order to measure correct water depth, the echo sounder needs to know the vertical distance between the vessel's water line and the transducer face. Here, enter the depth of the transducer face relative the waterline.

Note

If the Olex system is used, the Depth value must be set to 0 (zero).

Advanced

This button opens up the **Advanced Transceiver** dialogue box containing detailed numeric information about the transducer and the channel.

Related topics

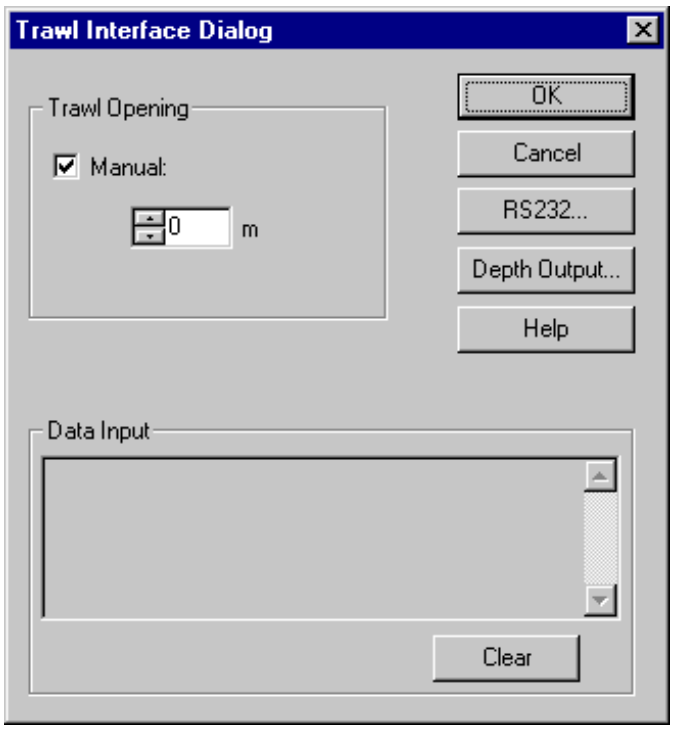
→ *Advanced Transceiver, page 71*

→ *Heave Sensor, page 93*

Trawl Interface

A **Simrad ITI** (Integrated Trawl Instrumentation) system can be connected to a RS-232 port at the rear of the ES60 computer. Communication with the ITI system is based on NMEA telegrams. The ES60 may transmit depth telegrams to the ITI. Useful input telegrams from the ITI are automatically interpreted.

- The **$IIDBS** telegram contains the headrope depth.
- The **@IIHFB** telegram contains the vertical distance between the headrope and the footrope.



Trawl opening

A fixed headrope-to-footrope distance can be manually entered. This is used for trawl sensor systems not measuring the trawl opening, or when the measured headrope-to-footrope distance is unreliable. Enable for manual setting in the check box, and enter the desired opening.

Data input

The most recent input telegrams are displayed in a list. This function is useful during installation and trouble shooting.

Clear - This button clears the list of input telegrams.

Other options

RS-232 - This button activates the **RS-232 Setup** dialogue box for communication port, baud rate etc.

Depth Output - This button activates the **Depth Output** dialogue box.

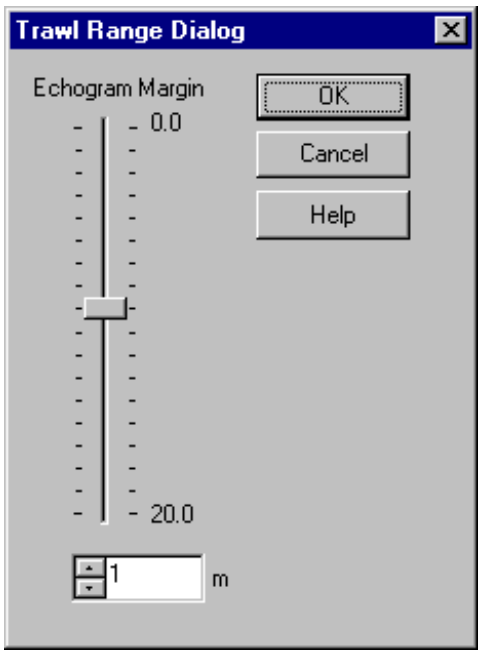
Related topics

→ *RS-232 Setup, page 112*

→ *Depth Output, page 83*

Trawl Range

The **Trawl Range** dialogue box opens if you click the right mouse button in the range field in the **Echogram and Range** view while operating with a **Trawl Range** echogram. The different echograms are explained in the **Echogram** dialogue box.



Echogram Margin - Trawl sensor systems communicate headrope depth and headrope-to-footrope distance to the sounder at regular intervals. The trawl echogram covers the vertical opening of the trawl including a small margin above and below. The headrope and footrope margins are identical.

Note that the headrope-to-footrope distance can be manually set in the **Trawl Interface** dialogue box. This is used for trawl sensor systems not measuring the vertical trawl opening, or when the measured headrope-to-footrope distance is unreliable.

Related topics

→ *Echogram, page 85*

→ *Trawl Interface, page 122*

ISBN 82-8066-028-3