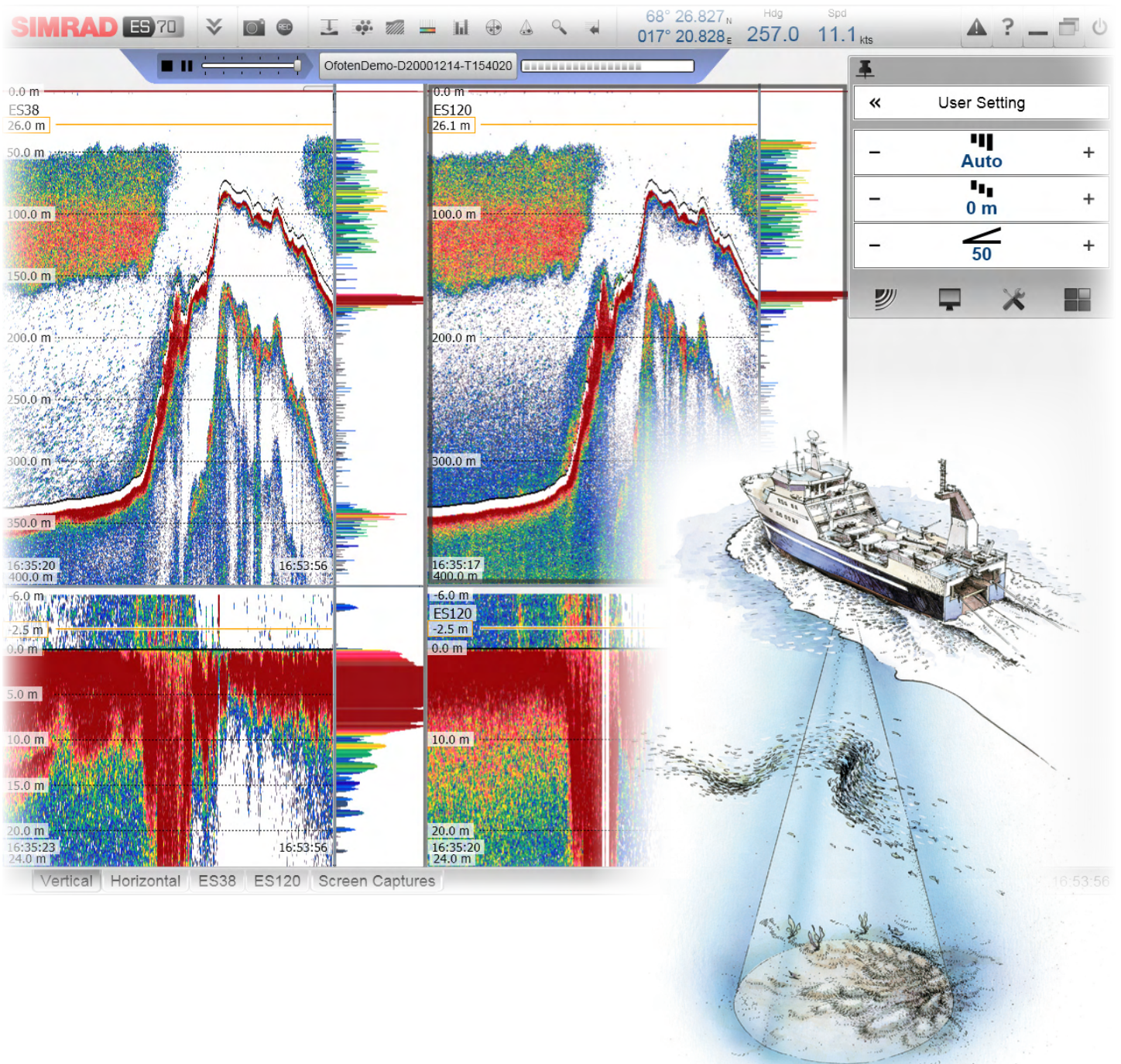


Operator manual

Simrad ES70 Fish finding echo sounder





KONGSBERG

Simrad ES70

Operator manual

Release 1.2.x

This manual provides you with the basic information required to operate the Simrad ES70. For a more detailed description of the operation and functionality, including menus and all parameters, refer to the *Simrad ES70 Reference manual*.

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License information

When you have obtained the necessary licenses to operate the ES70, we strongly advice that you write down the hardware ID and the license codes on this page.		
Function	Purpose	Code
Hardware ID:	N/A	
License code		
License code		
License code		

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The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. All users must be familiar with the contents of the appropriate manuals before attempting to install, operate, maintain or in any other way work on the equipment. Kongsberg Maritime AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Support information

If you require maintenance or repair, contact your local dealer. You can also contact us using the following address: simrad.support@simrad.com. If you need information about our other products, visit <http://www.simrad.com>. On this website you will also find a list of our dealers and distributors. See also *Support information* on page 12.

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About this manual

Purpose

The purpose of this operator manual is to provide the descriptions and procedures required to allow for safe and efficient use of the Simrad ES70.

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

If you need more detailed information about this product, refer to the *Simrad ES70 Reference manual*.

Target audience

The manual is intended for all basic users of the Simrad ES70.

We assume that you are familiar with the basic acoustic principles of sound in water, and that you have some experience with echo sounder operation.

Click “Help”!

Installed on your Simrad ES70 you will find a comprehensive on-line help system. You may not find it in your language, but everything you can read in the *Simrad ES70 Reference manual* can also be found in the context sensitive on-line help.

To access this information click [?] on the **Title Bar**, or the [?] button in one of the dialogs.

Note that when you open the help system it will place itself on the top of the display presentation!

Online information

All operation and installation end user documentation provided for your Simrad ES70 can be downloaded from <http://www.simrad.com>.

License information

The Simrad ES70 is a licensed product. In order to obtain a license, contact your local dealer.

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Simrad ES70

Study this chapter to familiarize yourself with the Simrad ES70.

Topics

- *Important* on page 10
- *System description* on page 11
- *System diagram* on page 12
- *Support information* on page 12

Important

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

Topics

- *When the ES70 is not used* on page 10
- *When you are docking your vessel* on page 10
- *If something breaks down* on page 10
- *When you switch off the ES70* on page 10
- *Transducer handling* on page 11

When the ES70 is not used

When you do not use the ES70, switch off the display and the computer.

If you know that you will not use the ES70 for a long time, we recommend that you also switch off the transceiver(s). Since each transceiver is not provided with a power switch, you must either disconnect the power cable, or disengage the relevant circuit breaker.

When you are docking your vessel

If the transducer is activated when out of water it may be damaged beyond repair. It is therefore very important that no one tries to use the ES70 when the vessel is in dry dock.

To ensure that this can not happen, disconnect the power supply cable to either the computer or the transceiver - or both! You may also remove the circuit breakers on the AC mains supply to the ES70 transceiver(s). Do this before the vessel is placed in the dry dock!

If something breaks down

If you believe that something has broken down, contact your local dealer. He will be able to assist.

A list of all our dealers is provided on <http://www.simrad.com>. If you are unable to contact a dealer, observe the support information in this chapter.

→ *Support information* on page 12

When you switch off the ES70

You must NEVER switch off the ES70 by means of the on/off switch on the computer.



You must ALWAYS exit the ES70 application by clicking the Exit button on the **Title Bar**.

If you power down the ES70 by means of the computer switch you may damage the software application and the interface parameters to external devices.

Transducer handling

Note

All transducers must be handled as delicate items. Any wrongful handling may damage the transducer beyond repair.

Do not activate the transducer when it is out of the water.

Do not lift the transducer by the cable.

Do not step on the transducer cable.

Do not handle the transducer roughly, avoid impacts.

Do not expose the transducer to direct sunlight or excessive heat.

Do not use high pressure water, sand blasting or metal tools to clean the transducer face.

Do not use strong solvents to clean the transducer face.

System description

The Simrad ES70 is a high accuracy professional single- and split-beam multi purpose fish finder. It is designed for the professional fishery community. The latest innovations in computer technology have been used to satisfy the increasing needs from our demanding customers: "Top performance at any depth, and easy to operate!"

The Simrad ES70 is a modular system, the basic configuration consists of a computer, a transceiver and a transducer. Using this basic configuration you can start with a simple single frequency single beam system. Later, you can expand the system to a multi-frequency echo sounder using single and/or split-beam transducers. You can choose from a wide variety of advanced software functions, transducers, and transceivers.

Multiple frequencies are available for the Simrad ES70. This is because different frequencies and transducers are used for different fisheries. Mackerel, Tuna, Anchovies, Herring and other schooled fish are best measured using a high frequency system, typically 120 or 200 kHz depending on the depth. Cod, Pollock, Seith and other bottom fish can be measured using 70 or 38 kHz systems, while 18 kHz is used for deep water species. Any two of the available frequencies can be assembled in the same transceiver cabinet. Each frequency is operated separately as with individual echo sounders, or simultaneously to see the frequency response from the fish on two different frequencies. You can add up to a total of six frequencies on the screen at the same time, or on separate monitors, using available software, computer technology and display monitors.

With the Simrad ES70, Simrad introduces a new way to present optional information. We call them *information panes*. With a click on the requested icon on the top bar, the information you wish to add to the echogram is presented in a dedicated frame. You can place the frame wherever you want, and you can change it to any size and shape. It is even transparent, so you will not lose any information from the echogram behind it.

The new zoom function provided by the Simrad ES70 is innovative, efficient and very easy to use. Using the trackball you can establish an area on the echogram. The information within this area is displayed in the Zoom pane, and the fish biomass is calculated and displayed. The zoomed area can be used to investigate a school of pelagic fish, or an area close to bottom.

System diagram

Two basic ES70 system diagrams are provided. Interface capabilities, power supplies and power cables are not shown.

Figure 1 System diagram with a single General Purpose Transceiver (GPT)

- A Display Unit
- B Processor Unit
- C General Purpose Transceiver (GPT)
- D Transducer

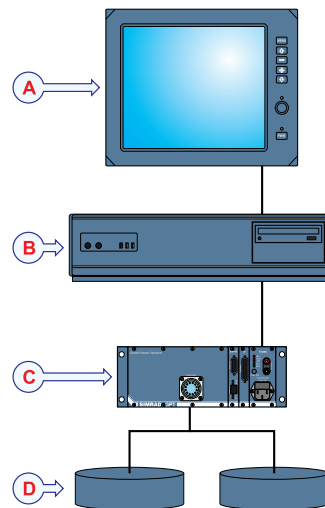
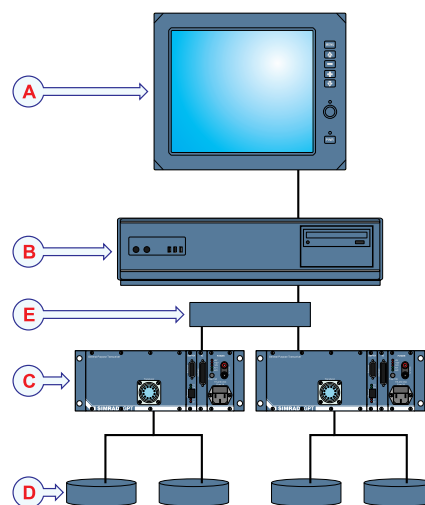


Figure 2 System diagram with two General Purpose Transceivers (GPT)

- A Colour monitor
- B Processor Unit
- C General Purpose Transceiver (GPT)
- D Transducer
- E Ethernet switch



Support information

If you need technical support for your Simrad ES70 you must contact your local dealer, or one of our support departments. A list of all our dealers is provided on <http://www.simrad.com>.

Norway (Main office)

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

Spain

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

USA

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

Malaysia

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

Getting started

This chapter describes how to get started with the basic operation of the Simrad ES70.

It contains an brief overview of the basic system operation and procedures. If you are a first time user, we recommend that you read through this chapter while operating the Simrad ES70 so that you can familiarize yourself with the menus, dialogs and display presentations.

Are you going to power up the Simrad ES70 for the first time?

If you are about to switch on your Simrad ES70 system for the very first time, see first chapter *Installation* on page 132. It provides hardware and software installation procedures, as well as dedicated procedures for initial start-up and configuration.

Have you installed at least one frequency channel?

This chapter assumes that the Simrad ES70 has at least one frequency channel (transceiver and transducer) readily connected. If this is not the case, observe the dedicated procedure in chapter *Installation; Installing frequency channels* on page 136.

Topics

- *Power on/off procedures* on page 15
- *Starting normal operation* on page 17
- *Operating principles* on page 27
- *Presentation overview* on page 29

Related topics

- *Installation* on page 132
- *Installing frequency channels* on page 136

Power on/off procedures

These procedures explain how to switch the ES70 system on and off.

Note

*When you power up the ES70 for the very first time, observe the procedures in chapter *Installation* on page 132.*

Make sure that you have sufficient water below the hull before you power up the ES70. If you start the ES70 with the transducer in air, you may damage it beyond repair!

Important

In this manual, the phrase “click” means that you shall place the cursor over the specified button, field or function, and press the left mouse (or trackball) button once. The phrase “double-click” means that you shall click the mouse button twice rapidly.

The phrase “press” means that you shall press a physical button with your finger, for example a character button or the **Enter** key on the keyboard.

Topics

- *Powering up the ES70* on page 15
- *Powering down the ES70* on page 17

Powering up the ES70

Purpose

This procedure explains how to power up the Simrad ES70.

This procedure assumes that you have connected one or more transceiver to the ES70. If this is not the case, observe the relevant start-up procedure in chapter *Installation*.

→ *Setting up the ES70 transceiver(s) for the first time* on page 135

Procedure

- 1 Verify that the transceiver(s) are switched on.
The General Purpose Transceiver (GPT) is not provided with an on/off switch.
Unless a dedicated solution has been provided during the installation to facilitate power on/off, the transceiver(s) are permanently powered up. However, if the ES70 has not been used for a longer period of time, the power to the transceiver(s) may have been disconnected.
- 2 Power up the colour display.
If required, refer to the instructions provided by the display manufacturer.
- 3 Power up the ES70 computer.
Wait for the operating system to start up.
- 4 Double-click the ES70 icon on the desktop to start the program.
- 5 Wait while the ES70 program starts on the computer.

6 Choose user settings.

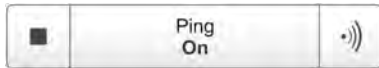
During the program load, a dialog appears to let you choose from the current user settings available on the ES70.

The dialog is only visible a few seconds. You do not need to make a choice here. You can select user setting at any time by means of the **User Settings** dialog on the **Main** menu.

7 Observe that the ES70 presentation fills the entire screen.

Important

When the ES70 program has started, the icon for the **Operation** menu will flash to remind you that “pinging” is disabled. This is for safety reasons. You must manually start “pinging” by means of the **Ping** button.



8 Choose operational mode.

This procedure explains how to set up the ES70 for normal operation and start ‘pinging’.

Procedure

a Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

b Click the **Operation** icon.

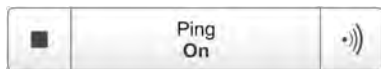
This icon is located under the **Main** menu. It is used to open the **Operaiton** menu.



→ *Operation menu* on page 109

c Click the **Operation** button, and select *Normal*.

d On the **Ping** button, click the symbol on the right hand side to start pinging.



9 On the **Ping** button, click the symbol on the right hand side to start pinging.

10 Observe that the ES70 starts.

The ES70 starts up using the same operational parameters as the last time you used it. If these parameters are acceptable, continue operation. If you wish to alter basic operational parameters, see the dedicated procedures.

When the ES70 starts, it is very important that it detects the bottom correctly. In most cases this will take place automatically. However, we have experienced that large schools of fish or difficult bottom conditions have deceived the ES70 to display the wrong depth. In these cases the sounder may display the bottom at 0,0 meters. In order to aid the ES70 to locate the correct depth, observe the dedicated procedure.

Related topics

- *Starting normal operation* on page 17

- *Checking the bottom detector settings* on page 20
- *Operation menu* on page 109

Powering down the ES70

Purpose

This procedure explains how to power off the Simrad ES70.

Note

You must never switch off the ES70 only by means of the on/off switch on the computer. This may damage the software or the interface parameters for external devices. You must ALWAYS use this procedure.

Procedure

- 1 Click the **Exit** button.

It is located on the **Title Bar** in the top right corner of the ES70 presentation.

- 2 Observe that the ES70 application closes down.

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

- 4 Switch off the colour display.

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

- 5 Switch off the transceiver(s).

The General Purpose Transceiver (GPT) is not provided with an on/off switch.

Unless a dedicated solution has been provided during the installation to facilitate power on/off, you can leave the transceiver(s) on. However, if you know that the ES70 is not to be used for a longer period of time, disconnect the power to the transceiver(s).



Starting normal operation

Once you have powered up the complete ES70 system, you are ready to start the actual operation.

When started up, the ES70 will automatically apply its previous setup parameters.

The procedures assume that the ES70 has at least one frequency channel (transceiver and transducer) readily connected. If this is not the case, observe the relevant installation procedure.

→ *Installing frequency channels* on page 136

These procedures are partly provided to get you acquainted with the basic functionality provided by the ES70, and partly to set up the system for normal use. If you already know the ES70, or the current parameters are acceptable, you do not need to carry out the procedures.

Topics

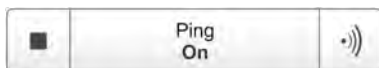
- *Setting operational mode “Normal” to start “pinging”* on page 18
- *Selecting menu language* on page 18
- *Checking the transceiver and transducer settings* on page 19
- *Checking the bottom detector settings* on page 20
- *Checking the colour scale settings* on page 21
- *Checking the size distribution and fish position settings* on page 22
- *Checking the echogram settings* on page 23
- *Checking the range settings* on page 25
- *Saving the current user settings* on page 27

Setting operational mode “Normal” to start “pinging”

This procedure explains how to set up the ES70 for normal operation and start ‘pinging’.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operaiton** menu.
→ *Operation menu* on page 109
- 3 Click the **Operation** button, and select *Normal*.
- 4 On the **Ping** button, click the symbol on the right hand side to start pinging.



Selecting menu language

The menu buttons – as well as other texts – in the ES70 presentation are available in several languages. This procedure explains how to select a different language.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Click the **Display** icon.
This icon is located under the **Main** menu. It is used to open the **Display** sub-menu.
→ *Display menu* on page 110
- 3 Click the middle of the **Language** button to open the list of available languages.
You can also click the [+] and [-] characters on the button to leaf through the list of available languages.



- 4 Click once on the language you wish to use.
- 5 Observe that the sub-menu is closed, and that all text in the menu buttons change to the selected language.

Important

To ensure that all texts are replaced with the chosen language, restart the ES70 application.

The context sensitive on-line help file may also be available in your language. To change the language in the on-line help, you must restart the ES70. If your language is *not* offered, the English on-line help will appear.

Checking the transceiver and transducer settings

This procedure explains how you can verify that the transceiver and transducer settings are correct.

Procedure

- 1 Observe that the currently connected transducer(s) are shown as tabs on the **Status bar**.

Each transducer name also identifies the operational frequency.

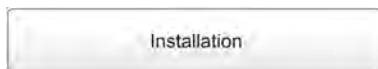
- 2 Click the **Setup** icon.

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

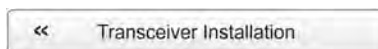


→ *Setup menu* on page 111

- 3 Click the **Installation** button to open the **Installation** menu.



On the menu, click **Transceiver Installation** to open the **Transceiver Installation** dialog.



The purpose of the **Transceiver Installation** dialog is to set up the necessary parameters to connect the ES70 computer to the transceiver(s) and the transducer(s).

- 4 Check that all applicable transceivers and transducers are connected and operational. For each transceiver, this is indicated by the green label with text “Installed”.

If a problem exists, refer to the relevant procedure in the *Operational procedures* chapter.

- 5 Click **OK** to save the current settings and close the dialog.
- 6 Click the **Operation** icon.

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



→ *Operation menu* on page 109

- 7 Click **Normal Operation** to open the **Normal Operation** dialog.



The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

- 8 For each frequency channel (transceiver/transducer combination):

- a Set **Mode** to *Active*.
- b Set **Pulse Length** to *Auto*.

The ES70 will automatically choose the best pulse duration to fit the operational frequency, mode and current depth. The pulse duration defines the resolution.

→ *Pulse duration* on page 127

- c Set **Power** to maximum.
- d Check that the **Depth** value is set correctly.

This is the depth of the transducer face relative to the water surface. A positive value of for example 5 meters means that the transducer is located 5 meters below the sea surface. For accurate depth readings, this **Depth** value must be set up correctly.

- 9 Click **OK** to save the current settings and close the dialog.

Checking the bottom detector settings

This procedure explains how to set up the bottom detector parameters (minimum and maximum depth) using the **Bottom Detector** dialog. Use these parameters if the ES70 has problems detecting the bottom.

Procedure

- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

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

Note

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The ES70 will then not be able to detect the bottom at all, and the displayed depth will be 0.00 m

- 4 Click **OK** to save the current settings and close the dialog.

Checking the colour scale settings

This procedure explains how you can change the colour scale currently used for the ES70 presentation.

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and experience. Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

If you choose to use 64 colours, the resolution of the ES70 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Procedure

- 1 Click the **Colour Scale** icon.

This icon is located on the **Title Bar**. It is used to open the **Colour Scale** information pane.

→ *Colour Scale information pane* on page 97



- 2 Observe that the current colour scale is shown.

You can filter out the weakest echoes by manually modifying the colour threshold.

By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

The currently selected colour scale is also shown on the **Status Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** menu.

Procedure

- a Click the **Colour Scale** icon.

This icon is located on the **Title Bar**. It is used to open the **Colour Scale** information pane.

→ *Colour Scale information pane* on page 97



- b Move the cursor to the left side of the colour scale.

Observe that the cursor changes shape to a dual arrow line.

- c Click on the left edge of the colour scale, keep the mouse button depressed, and drag the edge towards right.

- d Observe that the weakest colours are removed from the colour scale, and thus also the weakest echoes from the echogram presentation.
- e Release the mouse button.
- f In order to restore the weakest colours, click on the left edge of the current colour scale, and drag towards left.

3 Click the **Display** icon.

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

→ *Display menu* on page 110



4 On the **Display** menu, click **Colour Setup** to open the **Colour Setup** dialog.



The purpose of the **Colour Setup** dialog is to control the presentation colours used by the ES70.

5 Click **OK** to save the current settings and close the dialog.

Checking the size distribution and fish position settings

This procedure explains how to verify the current parameters for size distribution and fish size settings.

Important

The **Size Distribution** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

Procedure

1 Click the **Size Distribution** icon.

The icon is located on the **Title Bar**. It is used to open the **Size Distribution** information pane.

→ *Size Distribution information pane* on page 99



2 In the **Size Distribution** information pane, click the **Setup** icon in the top right corner to open the **Size Distribution** dialog.

The **Size Distribution** dialog allows you to shape the histogram in the **Size Distribution** information panel to your own requirements. You can set up the mode, the upper and lower limits, the accuracy, and the vertical resolution.

3 Click **OK** to save the current settings and close the dialog.

4 Click the **Fish Position** icon.

The icon is located on the **Title Bar**. It is used to open the **Fish Position** information pane.



The **Fish Position** information pane 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 view is “from above”. The colours indicate the echo strength.

→ *Fish Position information pane* on page 100

5 Click the **Echo Position** icon.

The icon is located on the **Title Bar**. It is used to open the **Echo Position** information pane.



The **Echo Position** pane 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 colours indicate the echo strength. This is basically the same view as the **Fish Position**, however the echoes are here viewed from the side and not from above.

→ *Echo Position information pane* on page 101

Checking the echogram settings

This procedure explains how you can control the echogram views, select an echogram to make it “active”, and check and - if necessary - change the parameter settings for the echogram.

Procedure

1 Observe the ES70 echogram.

If you have two or more channels (transducers/frequencies), observe the tabs on the **Status bar**.

→ *Display organization* on page 75

→ *Status Bar* on page 103

2 Click one of the transducer tabs. Observe that only the echogram from the selected frequency channel is shown.

By default, two echograms are shown for each frequency channel. The top echogram is surface related, while the bottom echogram is bottom related. Several echogram types are provided.

a **Surface**

The echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

→ *Biomass information pane* on page 97

b Bottom

The echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.

The biomass calculation is made in the same way as for **Surface** echograms.

c Pelagic

This echogram is nearly identical to the **Surface** echogram. However, the biomass is calculated in a different manner.

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

Example 1 Biomass calculation

If you are investigating a large school of pelagic fish, set the **Start Range** and **Range** to enclose the school. If the school is large enough, a **Surface** echogram may mistake it for bottom, and the biomass readings will be wrong. The **Pelagic** echogram will however disregard the bottom detection, and give a correct estimate of the biomass.

d Trawl

This echogram covers the vertical opening of the trawl.

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

The biomass calculation is made in the same way as for **Surface** echograms.

3 Move the cursor over the echogram.

Observe that a rectangular “tooltip” label is shown. It provides information about the echoes at the cursor's present position. Which information to include in the label is defined in the **Display Options** dialog.

4 Click the **Horizontal** tab. Observe that the echogram channels are shown horizontally.

5 Click the **Vertical** tab. Observe that the echogram channels are shown vertically.

- 6 Click on one of the echograms.

Observe that the echogram then appears with a thick border line. The echogram you have selected is now the “active” echogram. Any changes made in the **Echogram** dialog will by default only apply to this echogram.

- 7 On the **Active** menu, click **Echogram**.



Observe that the **Echogram** dialog opens.

The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 8 In the **Echogram** dialog, check that the **Lines** tab is shown.

The **Lines** tab in the **Echogram** dialog allows you to control the horizontal and vertical lines used to enhance the echogram presentation. It allows you to change the appearance of the bottom line. You can add an extra bottom line, and in addition to this you can enable either a white line or a hardness indicator line. The tab also offers several horizontal information lines, and you can choose the vertical scale of the echogram. Finally, the **Lines** tab offers time or distance markers, and you can enable annotations.

- 9 Click **Bottom line** and **White line** to enable these. Observe the changes on the echogram.

- 10 Click the **Echogram** tab.

The **Echogram** tab in the **Echogram** dialog allows you to select which TVG curve to use for the echogram. You can choose from several standard curves, or make your own. The tab also allows you to choose which type of echogram you wish to display.

→ *TVG gain* on page 123

- 11 Change the **Echogram Type** to see the variations.

- 12 Click the **Horizontal Axis** tab.

The **Horizontal Axis** tab in the **Echogram** dialog allows you to choose the horizontal scale of the echogram. This controls how “fast” the echogram moves from right towards left across the display.

- 13 Try the various options to see the variations on the echogram.

- 14 Click **OK** to save the current settings and close the dialog.

Checking the range settings

This procedure describes how to check and adjust the vertical range settings.

Procedure

- 1 Observe the vertical range of the echograms.

Note that the vertical range is set up differently depending on the echogram type.

- 2 Click in a surface related echogram to make it “active”.

- 3 Observe the **Range** button on the **Main** menu.



The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.

- 4 Observe the **Start Range** button on the **Main** menu.



The **Start Range** function allows you to specify the start depth of the echogram, that is from which depth in the water column the presentation shall start. The value shown and selected is applied to the currently selected echogram type.

In a surface related echogram, you can click **Automatic Start Depth** to allow the ES70 to select the start range automatically.

Example 2 Start Range in a surface related echogram

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

Example 3 Start Range in a surface echogram

In a surface echogram, set the **Start Range** value to 10 meters. This will make the echogram start from 10 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from 10 meters below the sea surface, and down to 10 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

- 5 Set **Range** to *Auto*.
 Set **Start Range** to 0.
 Observe the changes made to the surface related echogram.
- 6 Click in a bottom related echogram to make it “active”.
- 7 Observe the **Range** and **Start Range** buttons on the **Main** menu.

Example 4 Start Range and Range in bottom related echogram

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

8 Set **Range** to *15*.

Set **Start Range** to *5*.

Observe the changes made to the bottom related echogram.

Saving the current user settings

This procedure explains how to save the current configuration and parameter settings.

If you have several users with favourite configurations, if you work with different gears, or with different hardware configurations, depth or bottom conditions, we recommend that you save the ES70 operational parameters for future use.

Procedure

- 1** Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2** On the **Main** menu, click **User Settings** to open the **User Settings** dialog.



The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.

- 3** In the **User Setting** dialog, click the **Save Current Setting** button.
- 4** In the **Setting** dialog, click **OK** to accept the suggested name.
- 5** You can also choose a different name.

If you have a keyboard connected to the ES70 computer, you can click in the text field, remove the suggestion, and enter any name.

Tip _____

If you do not have a computer keyboard connected to your ES70 system, click the **Keyboard** button to open an on-screen keyboard.

Click **OK** to save the settings with the chosen name.

- 6** Observe that the name you have chosen appears on the **Saved Settings** list.
- 7** Click **OK** to save the current settings and close the dialog.

Operating principles

Like most computerized applications, the ES70 is operated using a mouse (or trackball) and an optional keyboard.

Important

In this manual, the phrase “click” means that you shall place the cursor over the specified button, field or function, and press the left mouse (or trackball) button once. The phrase “double-click” means that you shall click the mouse button twice rapidly.

The phrase “press” means that you shall press a physical button with your finger, for example a character button or the **Enter** key on the keyboard.

Topics

- *Cursor* on page 28
- *Mouse* on page 28
- *Trackball* on page 29

Cursor

The mouse (or trackball) controls the cursor movement on the ES70 presentation. By moving the cursor over the various information provided on the display, and clicking the left mouse button, you are able to control all operation.

Tip

If you are left-handed, the Windows operating system allows you to redefine the mouse buttons. You can then choose to click with the right button.

The shape and purpose of the cursor change depending on its location.

- Move the cursor over the **Title Bar** at the top of the presentation and **Status Bar** at the bottom, and left-click the icons and buttons to access the functionality provided.
- Move the cursor over the echogram, and observe the tooltip that provides detailed information about the echo information at the depth indicated by the cursor location.
- Move the cursor over the menu and menu buttons, and click to alter the operational parameters and open dialogs. Observe that the shape of the cursor changes over the menu buttons to indicate which choices you have to control these parameters.

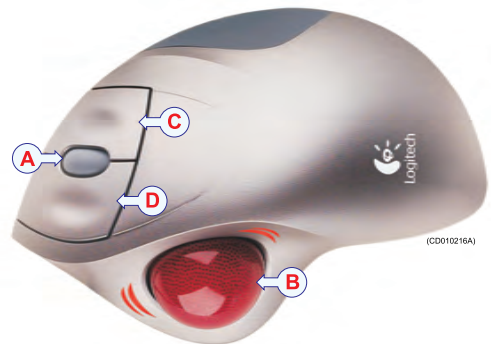
Mouse

The computer mouse can be used to control the functionality provided by the ES70. The mouse controls the movements of the cursor, and the buttons are used to click on buttons and select parameters.

Trackball

All ES70 functions can be controlled with the trackball. The ball controls the movements of the cursor, and the buttons are used to click on buttons and select parameters.

- A *Control wheel (not used)*
- B *Trackball, use this to control the cursor's location on the screen*
- C *Right mouse button (not used)*
- D *Left mouse button*



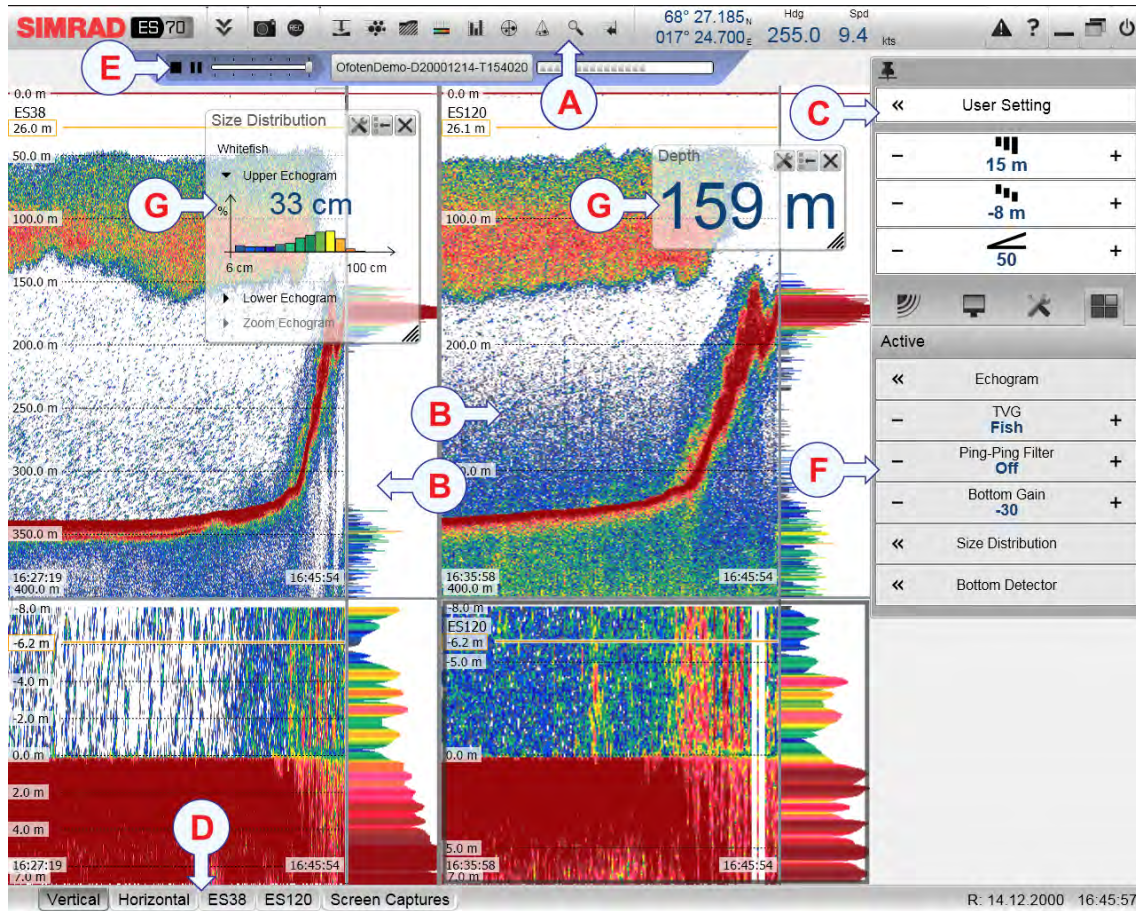
Presentation overview

The display presentation offered by the Simrad ES70 system provides a number of echograms. It also provide a Title Bar, a Status Bar and a menu system to facilitate operation using a computer mouse or a trackball.

Topics

- *Echo sounder presentations* on page 30
- *Title Bar* on page 32
- *Status Bar* on page 33
- *The menu system* on page 35
- *The menu buttons* on page 35

Echo sounder presentations



A typical ES70 display presentation is shown.

A Title Bar

The **Title Bar** identifies the manufacturer's and product logo, and provides several icons and buttons. These are used to hide or retrieve the menu system and the information panes, provide navigational information, and to enable basic system functions.

- *Title Bar* on page 77
- *Information panes* on page 95

B Echogram(s)

The **Echogram(s)** take up the largest part of the ES70 display presentation.

By default, you will have two echograms for each frequency channel (transceiver/transducer combination); surface related and bottom related. If you have more than one frequency channels, the echograms for each frequency can be presented horizontally with one over the other, or next to each other. This is controlled by tabs on the **Status bar** (D).

- *Echograms* on page 87

If you click in an echogram, the echogram is selected to be “active”. The “active” echogram is identified with a thick border. If you change parameters related to the echograms, these are by default only applied to the “active” echogram.

Tip

You can modify the size of the echograms by moving the boundary lines between the echograms. Click on a boundary line, hold the button depressed, and move the line horizontally or vertically.

C Menu system

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



→ *Menu system* on page 86

D Status Bar

The **Status Bar** is located at the bottom of the ES70 presentation.

→ *Status Bar* on page 103

E Replay Bar

F Sub-menus

The sub-menus may be opened from the icons at the bottom of the **Main** menu.



→ *Menu system* on page 86

G Information panes

You can choose from several **Information panes** to provide you with additional data. These panes are selected from the buttons on the **Title Bar**. The panes can be moved around on the echogram presentation, and you can change their sizes. The panes are transparent, so echogram information displayed behind them are not lost.

→ *Information panes* on page 95

Title Bar

The ES70 **Title Bar** is located on the top of the display presentation, and it is stretched from the far left to the far right side.

The purpose of the **Title Bar** is to give you fast access to key functionality and navigational information.

It provides buttons to hide or show the menu, to make a screen capture, to open the **Messages** dialog, and to open the context sensitive on-line help. It also provides a few buttons related to operating system features.

And more important, the **Title Bar** provides the dedicated buttons to open the various information panes.



A Logo and product name.

This element identifies the manufacturer and the product.

B Menu

Click this button to hide or recall the menu system.

C Screen capture, Record and Event

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

D Information panes

Click any of these buttons to open and close an information pane.

E Navigation field

These are not buttons, but information icons providing current data related to the vessel movements.

F Depth Alarms

This field shows you the currently chosen depth alarms.

When the alarm is triggered, the **Depth Alarms** field changes colour to red. The warning is also provided as a message in the messaging system and - if enabled - as an audio signal.



To acknowledge the alarm, click the **Depth Alarms** field to open the dialog. The alarm sound is then automatically disabled. To “restart” the alarm, click to enable **Use Alarm Sound**.

G Function buttons

These buttons are used to control basic system functions.

- **Alarm:** Click this button to open the **Messages** dialog. This button will flash to indicate that a message is posted.
- **Help:** Click this button to open the context sensitive on-line help.
- **Minimize and Resize:** Click these buttons to adjust the size of the ES70 presentation.

- **Exit:** Click this button to close down the ES70 application.

Related topics

- *Logo and product name* on page 78
- *Menu button* on page 78
- *Screen Capture button* on page 78
- *Record button* on page 79
- *Information pane icons* on page 79
- *Navigation Field* on page 82
- *Function buttons* on page 84

Status Bar

The **Status Bar** is located at the bottom of the ES70 presentation.

The purpose of the **Status Bar** is to give you fast access to key functionality, as well as time and date information.



A Presentation format

- **Vertical:** This tab places your current echograms next to each other in a vertical presentation.
- **Horizontal:** This tab places your current echograms on top of each other in a horizontal presentation.

If only one active frequency channel is in use, you will have only one echogram. These tabs are then not shown.

B Transducer selection

These tabs on the **Status Bar** reflect the actual transducers used by the ES70. The two transducers shown here are just an example. If only one transducer is in use, you will have only one echogram. These tabs are then not shown.

- **ES38:** This tab allocates the ES70 presentation to only show the echogram from this transducer.
- **ES120:** This tab allocates the ES70 presentation to only show the echogram from this transducer.

C Screen Captures

This tab on the **Status Bar** hides the current “live” echograms from view, and allows you to see the echogram images you have previously saved using the **Screen Capture** button on the **Title Bar**.

The echograms are presented in a graphic browser. You can open any of the images for a closer study, or you can access the files directly by clicking the **Open Image Folder** button.

→ *Title Bar* on page 77

→ *Screen captures* on page 105

D Colour scale

This colour bar on the **Status Bar** presents the currently selected colour scale.

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and experience. Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

If you choose to use 64 colours, the resolution of the ES70 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

To change the colour scale, use the **Colour Setup** dialog on the **Display** menu. You can also access the colour scale using the **Colour Scale** information pane.

→ *Colour Scale information pane* on page 97

E Date

This field on the **Status Bar** presents the current date.

Note that during replay, the date of the replay file is shown. An “R” is displayed in front of the date to identify this.

F Time

This field on the **Status Bar** presents the current time.

Note that during replay, the time in the replay file is shown.

The menu system

The menu system on the ES70 is by default placed on the right hand side of the display presentation. You can however easily move the menu to the left side using the **Display Options** dialog, or hide it from view with the **Menu** button on the **Title Bar**.

The main menu is short, and the sub-menus are opened by clicking on the icons under the **Main** menu.

The selection of operational parameters on the ES70 is done using a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialogs or miniature menus to provide additional parameters.

The **Main** menu provides the parameters most frequently used during normal operation.

Below the main menu, dedicated icons are used to open the other menus. These are (from left):



- a The **Operation** menu controls the main operational parameters.
- b The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- c The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- d The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected view or object.

The menu buttons

Each menu contains several menu buttons. Each button shows the function of the button, some of them also display the current parameter setting. The majority of the buttons in each menu provide one or more of these functions.

- You can increase and decrease parameter values by clicking the [+] and [-] fields on the button.
- You can change parameter values by clicking on the button, holding the mouse depressed, and then moving the cursor sideways.
- You can change parameter values by means of the scroll wheel on the mouse or trackball.
- You can enter parameter values from the keyboard (if you have one).
- You can select parameter value from the button's sub-menu.
- You can open a dedicated dialog.



How to select a numerical parameter using the +/- buttons

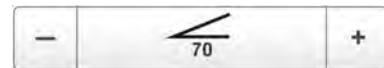
- 1 Move the cursor to either side of the button, and observe that the background colour changes.



- a Click on the left side of the button to decrease the numerical value.
- b Click on the right side of the button to increase the numerical value.

How to select a numerical parameter by moving the cursor horizontally

- 1 Place the cursor on the middle of the button.
- 2 Click and hold the left mouse button depressed.



- 3 Move the cursor horizontally: left to decrease the parameter value, or right to increase it.
- 4 Release the mouse button when the requested value is shown.

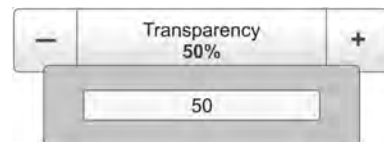
How to select a numerical parameter by means of the scroll wheel

- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the parameter value.
- 3 Release the scroll wheel when the requested value is shown.



How to select a numerical parameter using the keyboard

- 1 Click the middle section of the button to open a text field.
- 2 Enter the numerical value into the text field.



If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red. You will then not be able to enter the value.

- 3 Press the **Enter** key.

How to select a parameter using a sub-menu

- 1 Click the middle section of the button to open a sub-menu, then click the requested parameter value.



The chosen value is applied, and the sub-menu is automatically closed.

- 2 Whenever applicable, you can also access the sub-menu by clicking the left and right side of the button. This method will not show you the parameter choices.
 - a Click on the left side of the button to select a 'lower' sub-menu choice.
 - b Click on the right side of the button to select a 'higher' sub-menu choice.

How to select parameters using a dialog



- 1 Click anywhere on the button to open a separate dialog.

Operational procedures

This chapter contains a selection of procedures explaining how you can put your Simrad ES70 to use.

Menu navigation employed by Simrad ES70 is similar to the other Simrad applications which follow the user interface standards developed by Simrad. The main menu is normally located at the right side of the screen, and by means of dedicated icons at the bottom of the main menu, you can open the relevant sub-menus or dialogs. Menu choices shown in dark colours are not available for the current operation or operational mode.

Are there any procedures missing? Are you performing an operation that we have not explained? Write an e-mail to simrad.support@simrad.com and ask. We may then include the procedure in the next version of this manual.

Topics

- *User setting procedures* on page 39
- *User preference procedures* on page 41
- *Save and recall echograms* on page 44
- *Presentation procedures* on page 49
- *Echogram procedures* on page 52
- *Range procedures* on page 60
- *Bottom detection procedures* on page 62
- *Size distribution, biomass and fish density procedures* on page 66
- *Gain procedures* on page 69
- *Power and pulse duration procedures* on page 71

Related topics

- *Powering up the ES70* on page 15
- *Powering down the ES70* on page 17

User setting procedures

The ES70 allows you save your user settings. You can save as many settings as you like, the number is only limited by the size of your hard disk.

All parameters you have chosen to set up the ES70 to suit your preferences are saved. You can use any name - including your own - to identify the saved settings. Whenever required, you can retrieve any saved setting, and continue your work.

To reset the entire ES70, you can also retrieve the factory default settings.

Topics

- *Saving the current user settings* on page 39
- *Using previously saved settings* on page 40
- *Choosing ES70 factory default settings* on page 40

Saving the current user settings

This procedure explains how to save the current configuration and parameter settings.

If you have several users with favourite configurations, if you work with different gears, or with different hardware configurations, depth or bottom conditions, we recommend that you save the ES70 operational parameters for future use.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog.



The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.

- 3 In the **User Setting** dialog, click the **Save Current Setting** button.
- 4 In the **Setting** dialog, click **OK** to accept the suggested name.
- 5 You can also choose a different name.

If you have a keyboard connected to the ES70 computer, you can click in the text field, remove the suggestion, and enter any name.

Tip _____

If you do not have a computer keyboard connected to your ES70 system, click the **Keyboard** button to open an on-screen keyboard.

Click **OK** to save the settings with the chosen name.

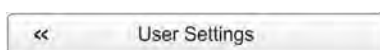
- 6 Observe that the name you have chosen appears on the **Saved Settings** list.
- 7 Click **OK** to save the current settings and close the dialog.

Using previously saved settings

If you have saved sensor configurations dedicated for different gears or different tasks, you can retrieve these for fast and efficient parameter setup.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog.



The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.

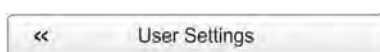
- 3 In the **User Setting** dialog, click once on the requested saved setting in the **Saved Settings** list.
- 4 Click **Activate Selected Setting**.
- 5 Click **OK** to save the current settings and close the dialog.

Choosing ES70 factory default settings

This procedure explains how to choose the factory or saved parameter settings. Use this if you need to reset the ES70 to known settings.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog.



The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.

- 3 In the **Factory Settings** list, click the requested factory setting.
- 4 Click **Activate Selected Setting**.
- 5 Click **Close** to exit.

User preference procedures

This section provides procedures related to user preferences and individual customizing.

Topics

- *Selecting menu language* on page 41
- *Choosing colour presentation theme (palette)* on page 41
- *Choosing screen brightness* on page 42
- *Selecting measurement units* on page 42
- *Verifying or changing the environmental parameters* on page 43

Selecting menu language

The menu buttons – as well as other texts – in the ES70 presentation are available in several languages. This procedure explains how to select a different language.

Procedure

1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

2 Click the **Display** icon.

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



→ *Display menu* on page 110

3 Click the middle of the **Language** button to open the list of available languages.

You can also click the [+] and [-] characters on the button to leaf through the list of available languages.

4 Click once on the language you wish to use.

5 Observe that the sub-menu is closed, and that all text in the menu buttons change to the selected language.

Important

To ensure that all texts are replaced with the chosen language, restart the ES70 application.

The context sensitive on-line help file may also be available in your language. To change the language in the on-line help, you must restart the ES70. If your language is *not* offered, the English on-line help will appear.

Choosing colour presentation theme (palette)

The ES70 presentation may be set up using one of several colour themes. In the menu system, these are called *palettes*.

The **Palette** function provides you with options for the colour scheme used on the ES70 display. Select the background colour and brightness to suit the ambient light conditions and your preferences.

The choice you make here does not have any effect on the ES70 performance.

Procedure

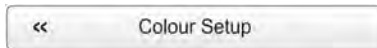
- 1 Click the **Display** icon.

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

→ *Display menu* on page 110



- 2 On the **Display** menu, click **Colour Setup** to open the **Colour Setup** dialog.



The purpose of the **Colour Setup** dialog is to control the presentation colours used by the ES70.

- 3 Click the palette you wish to use.
To test your choice, make a selection, and click **Apply**.
- 4 Click **OK** to save the current settings and close the dialog.

Choosing screen brightness

This procedure explains how to reduce the intensity of the light emitted from the display.

When the bridge is dark, the light emitted by the ES70 display can affect your night vision. In order to compensate for this, you can reduce the intensity. The **Screen Brightness** allows you to reduce the this brightness, and hence make the display darker.

The intensity of light emitted by the display can be reduced from 100% to 0% in steps of 10.

Procedure

- 1 Click the **Display** icon.

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

→ *Display menu* on page 110



- 2 Click either side of the **Screen Brightness** button to make the adjustment.



Selecting measurement units

This procedure explains how to change the measurement units in the ES70 presentations.

The ES70 is prepared to work with several standards for units of measurements.

Use the **Units** dialog to set up the various units of measurements you wish to work with. The ES70 will use these in all presentations. Normally, you will only need to define these once.

Use the spin boxes in the dialog to make the selections.

Procedure

- 1 Click the **Display** icon.

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

→ *Display menu* on page 110



- 2 Click **Units** to open the **Units** dialog.



- 3 Make the necessary adjustments.
- 4 Click **OK** to save the current settings and close the dialog.

Verifying or changing the environmental parameters

This procedure explains how to check and - if necessary - change the environmental parameters related to salinity, sound speed and water temperature.

Procedure

- 1 Click the **Setup** icon.

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

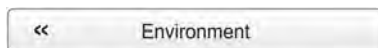
→ *Setup menu* on page 111



- 2 Click the **Installation** button to open the **Installation** sub-menu.



On the menu provided, click **Environment** to open the **Environment** dialog.



The purpose of the **Environment** dialog is to adjust the parameters related to salinity, sound speed and water temperature.

- 3 Specify if you work in fresh or salt water.
- 4 If you have an instrument that offers a more accurate sound speed value than the default entry, change it.
- 5 If you have sensor that reads the water temperature, connect to it.
- 6 Click **OK** to save the current settings and close the dialog.

Save and recall echograms

These procedures explain how to save and recall echogram images and raw data.

Topics

- *Saving a single echogram image* on page 44
- *Saving echogram sequences (raw data)* on page 44
- *Recalling single echogram images* on page 46
- *Recalling echogram sequences (raw data)* on page 46
- *Accessing the screen capture image files to delete, move or copy* on page 47
- *Accessing the raw data files to delete, move or copy* on page 48

Saving a single echogram image

This procedure explains how to save a single echogram image as a bitmap file using the **Screen Capture** function.

On the ES70, you can save the echograms in three different ways.

- a Bitmap images are saved whenever you click the **Screen Capture** button on the **Title Bar**. These images are recalled by means of the **Screen Capture** button on the **Status bar**.
- b Echogram sequences (raw data) are recorded using the **Record** function on the **Operation** menu. These sequences are played back by placing the ES70 in *Replay* mode.
- c A “history file” is recorded automatically and continuously. When the file is full, it will start to overwrite the oldest data, thus creating a “ring buffer”. To play back the history file, click the **History** button on the **Title Bar**.

Procedure

- 1 Observe the **Screen Capture** button on the **Title Bar**.
- 2 Click the button to save the current display presentation.

The screen capture is saved on the hard disk in standard JPG format.

The recorded capture includes the entire presentations, and thus includes the current echograms and the menu.

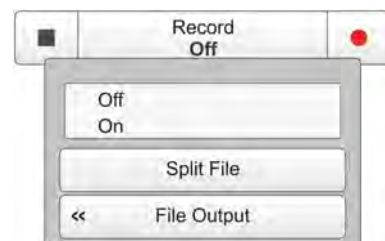
- 3 To recall the screen capture, see *Recalling single echogram images* on page 46.



Saving echogram sequences (raw data)

This procedure explains how to store raw echogram data. Each sequence of raw data – often regarded as a “line” during a survey – contains a set of echogram data saved on digital format. Once saved, you can play back this data just as if it was “normal” echogram data.

On the ES70, you can save the echograms in three different ways.



- a Bitmap images are saved whenever you click the **Screen Capture** button on the **Title Bar**. These images are recalled by means of the **Screen Capture** button on the **Status bar**.
- b Echogram sequences (raw data) are recorded using the **Record** function on the **Operation** menu. These sequences are played back by placing the ES70 in *Replay* mode.
- c A “history file” is recorded automatically and continuously. When the file is full, it will start to overwrite the oldest data, thus creating a “ring buffer”. To play back the history file, click the **History** button on the **Title Bar**.

Note

Raw data files will normally become very large. If you wish to record large amounts of ES70 raw data, make sure that you have enough space on your hard disk. Unless your computer is equipped with a very large disk capacity, we recommend that you save the raw data to an external storage device.

Procedure

- 1 Click the **Operation** icon.

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



→ *Operation menu* on page 109

- 2 Click **Record** to open the button’s sub-menu.
- 3 Click **File Output** to open the **File Output** dialog.
- 4 In the **File Output** dialog:

- a On the **Directory** tab, define the file output directory.

Important

These are the default directories for raw data:

Windows XP
c:\documents and settings\all users\application data\simrad\ES70\data
Windows 7
c:\programdata\simrad\ES70\data

- b On the **Raw Data** tab, click **Save Raw Data** to enable this export.

Raw data are the echo data received directly from the output of the transceiver. The data can later be replayed on the ES70. The data contain sample data, echo sounder configuration data, navigation data (NMEA format) and annotations (if any).

- c Define any other parameters to fit your requirements.
- d Click **OK** to save the current settings and close the dialog.

- 5 To start recording, you have two choices:
 - a In the **Record** button, select *On*.
 - b On the **Title Bar**, click the **Record** button.
When activated, the **Record** button is red.
- 6 To stop recording, you have two choices:
 - a In the **Record** button, select *Off*.
 - b On the **Title Bar**, click the **Record** button.
When not activated, the **Record** button is black.
- 7 To play back the raw data files, see *Recalling echogram sequences (raw data)* on page 46.



Recalling single echogram images

This procedure explains how you can recall single echogram images.

Procedure

- 1 Observe the **Screen Capture** button on the **Status Bar** at the bottom of the presentation.
→ *Status Bar* on page 103
- 2 Click **Screen Captures**.
Observe that the built-in image browser starts. All the currently saved echogram images are shown as miniatures.
- 3 Double-click on the miniature you wish to enlarge.
- 4 Click **Return To Browser** to close the image.
- 5 Click one of the transducer tabs on the **Status Bar** to return to the echogram presentation.

Recalling echogram sequences (raw data)

This procedure explains how you can play back (recall) echogram sequences (raw data).

Procedure

- 1 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operaiton** menu.
→ *Operation menu* on page 109
- 2 Click the **Operation** button to open the button's menu choices.
- 3 Click **Replay File** to open the **Replay File** dialog.



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

- 4 In the **Replay File** dialog:
 - a Click **Add** to select new files using operating system functionality.
If you wish to remove files from the playback list, click on the file name and then click **Remove**.
 - b If you wish to run the replay file continuously, click **Loop** in the **Replay File** dialog.
 - c Click **OK** to save the current settings and close the dialog.
- 5 Click the **Operation** button to open the button's menu choices.
- 6 Click **Replay** to select this function.
Observe that the **Replay bar** opens.
→ *Replay bar* on page 86
- 7 Click the start button in the **Replay bar** to start the playback.
- 8 To stop the playback, you have two choices:
 - a Click the stop button in the **Replay bar**
 - b Go back to normal operational mode.

Accessing the screen capture image files to delete, move or copy

Once the screen capture bitmap images have been saved, you may also wish to delete them, or copy or move them from the computer's hard disk to a separate storage media. This procedure explains how to access the files, and how to copy or move them to a separate storage device.

Important

This procedure assumes that you are familiar with the Microsoft® XP® and/or Microsoft® 7 operating system utilities for file handling.

Procedure

- 1 Observe the **Screen Capture** button on the **Status Bar** at the bottom of the presentation.
→ *Status Bar* on page 103
- 2 Click **Screen Captures**.
Observe that the built-in image browser starts. All the currently saved echogram images are shown as miniatures.
- 3 In the browser, click **Open Image Folder** to open an operating system folder.

- 4 Use the functionality provided by the operating system to navigate to the file folder with the bitmap files.

These are the default directories for the bitmap images:

Windows XP
c:\documents and settings\All Users\Application data\Simrad\ES70\ScreenDumps
Windows 7
c:\programdata\Simrad\ES70\ScreenDumps

- 5 Prepare a separate data storage device
This is typically a large capacity USB memory device or a harddisk. You can also connect the ES70 computer to a network, and copy the files to a server.
- 6 Use the functionality provided by the operating system to delete the files, or to copy or move them to the separate storage device.
- 7 Close the file manager utility.
- 8 Click one of the transducer tabs on the **Status Bar** to return to the echogram presentation.

Accessing the raw data files to delete, move or copy

Once raw data files have been recorded, you may also wish to delete them, or copy or move them from the computer's harddisk to a separate storage media. This procedure explains how to access the files, and how to copy or move them to a separate storage device.

Important

This procedure assumes that you are familiar with the Microsoft® XP® and/or Microsoft® 7 operating system utilities for file handling.

Procedure

- 1 Observe the **Screen Capture** button on the **Status Bar** at the bottom of the presentation.
→ *Status Bar* on page 103
- 2 Click **Screen Captures**.
Observe that the built-in image browser starts. All the currently saved echogram images are shown as miniatures.
- 3 In the browser, click **Open Image Folder** to open an operating system folder.

- 4 Use the functionality provided by the operating system to navigate to the file folder with the raw data files.

This is the folder you selected in the **File Output** dialog.

Important

These are the default directories for raw data:

Windows XP
c:\documents and settings\all users\application data\simrad\ES70\data
Windows 7
c:\programdata\simrad\ES70\data

- 5 Prepare a separate data storage device
This is typically a large capacity USB memory device or a harddisk. You can also connect the ES70 computer to a network, and copy the files to a server.
- 6 Use the functionality provided by the operating system to delete the files, or to copy or move them to the separate storage device.
- 7 Close the file manager utility.
- 8 Click one of the transducer tabs on the **Status Bar** to return to the echogram presentation.

Presentation procedures

These procedures explain how to control the presentations on the ES70 display.

Topics

- *Changing the size of the presentation fields* on page 49
- *Selecting echogram presentation layout* on page 50
- *Selecting which echograms to display* on page 50
- *Selecting colour scale and presentation palette* on page 50
- *Changing the colour scale to remove the weakest echoes* on page 51

Changing the size of the presentation fields

You can modify the size of each individual field in the ES70 presentation. The content in a field that changes size will automatically adjust to take full advantage of the space available.

Procedure

- 1 Move the cursor to the border line between two fields.
Observe that the marker changes form; it now appears as two parallel lines with arrows pointing out.
- 2 Click on the left mouse button, and keep it depressed.

- 3 Move the mouse – or roll the control wheel – and observe that the border line moves.
- 4 Release the mouse button when the border line has been moved to desired position.

Selecting echogram presentation layout

Your ES70 may be set up with one or more frequencies (channels).

Use the buttons on the **Status bar** to select how the channels are shown on the presentation.

Procedure

- 1 Observe the buttons on the **Status bar** at the bottom of the ES70 presentation.
- 2 In order to control the horizontal or vertical presentation when you have two or more echograms, use these buttons on the **Status bar**.
 - **Horizontal** for a horizontal presentation
 - **Vertical** for a vertical presentation
 - **[Transducer name]** to see only the echogram for the chosen transducer→ *Status Bar* on page 103

Selecting which echograms to display

Your ES70 may be set up with one or more frequencies (channels).

The **Layout** dialog allows you to control which channels you can see on the display.

Procedure

- 1 Click the **Display** icon.

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

→ *Display menu* on page 110



- 2 Click **Layout** to open the **Layout** dialog.



The purpose of the **Layout** dialog is to define which transceiver channels you wish to present on the display presentation. You can also position the echograms in relation to each other.

- 3 Make the necessary adjustments.
- 4 Click **OK** to save the current settings and close the dialog.

Selecting colour scale and presentation palette

This procedure explains how to change the colour scale and the presentation palette on the ES70 echograms.

By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

The currently selected colour scale is also shown on the **Status Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** menu.

Procedure

- 1 Click the **Display** icon.

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

→ *Display menu* on page 110



- 2 On the **Display** menu, click **Colour Setup** to open the **Colour Setup** dialog.



The purpose of the **Colour Setup** dialog is to control the presentation colours used by the ES70.

- 3 Select palette to suit your requirements
- 4 Select echogram colours to suit your requirements

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and experience. Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

If you choose to use 64 colours, the resolution of the ES70 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

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

Changing the colour scale to remove the weakest echoes

You can filter out the weakest echoes by manually modifying the colour threshold.

By default you have 64 or 12 colours available to present the echograms, and a selection of palettes. The colour scale can be retrieved any time by clicking the **Colour Scale** icon on the **Title Bar**.

The currently selected colour scale is also shown on the **Status Bar**.

Which colour scale to use is defined in the **Colour Setup** dialog on the **Display** menu.

Procedure

- 1 Click the **Colour Scale** icon.

This icon is located on the **Title Bar**. It is used to open the **Colour Scale** information pane.

→ *Colour Scale information pane* on page 97



- 2 Move the cursor to the left side of the colour scale.
Observe that the cursor changes shape to a dual arrow line.
- 3 Click on the left edge of the colour scale, keep the mouse button depressed, and drag the edge towards right.
- 4 Observe that the weakest colours are removed from the colour scale, and thus also the weakest echoes from the echogram presentation.
- 5 Release the mouse button.
- 6 In order to restore the weakest colours, click on the left edge of the current colour scale, and drag towards left.

Echogram procedures

These procedures explain the various parameters controlling the ES70 echogram.

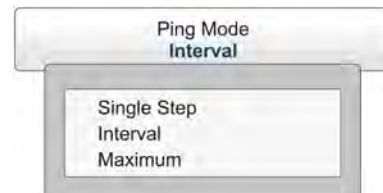
Topics

- *Changing the 'ping' parameters* on page 52
- *Selecting echogram type* on page 53
- *Adding horizontal markers to the echogram* on page 55
- *Adding vertical markers and annotations to the echogram* on page 56
- *Selecting TVG gain in the Echogram dialog* on page 57
- *Removing interference and vessel's own noise using the 'ping-ping' filter* on page 58
- *Removing interference using sequential pinging* on page 59
- *Making it easier to see the bottom* on page 59

Changing the 'ping' parameters

This procedure explains how to control how often the ES70 transmits acoustic energy into the water. This is normally referred to as 'pinging'.

The "ping rate" is the parameter that controls how often the echo sounder shall transmit acoustic energy (a "ping") into the water.



If you observe a pelagic echo on the ES70, and it seems to follow the bottom contour, it may in fact be a false echo from the previous transmission ("ping"). The only way to remove this false echo is to reduce the ping rate. If you do this, all the echoes from the previous ping will have disappeared before you transmit the next. On old paper based

echo sounders the pen spent a long time on the rear side of the paper tray, and that reduced the ping rate. The ES70 is a lot faster, and you may send out a ping even before the energy from the previous ping has disappeared.

Procedure

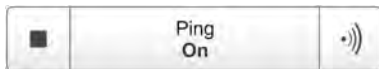
- 1 Click the **Operation** icon.

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

→ *Operation menu* on page 109



- 2 Click **Ping**, and select *On*.



The two icons provided by this button can also be used to enable or disable transmission.

- The left icon (dark rectangle) is “Off”.
- The right icon is “On”. It is also used to initiate single pings when *Single Step* mode is selected.

- 3 How to choose maximum ping rate:

- a Click **Ping Mode**, and select *Maximum*.

This will make the ES70 ping with maximum speed. The time between each ping is automatically determined by a number of parameters, including the current depth, the pulse duration and the chosen range.

- 4 How to define a ping interval:

- a Click **Ping Mode**, and select *Interval*.
- b Click **Ping Interval**, and select the time (in milliseconds) between each ping.



- 5 How to transmit single pings:

- a Click **Ping Mode**, and select *Single Step*.
- b To transmit a single ping, click once on the right hand icon on the **Ping** button.

Selecting echogram type

This procedure explains how to choose the echogram type you wish to see.

Tip

On the ES70 you can choose from several echogram presentations.

a Surface

The echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

→ *Biomass information pane* on page 97

b Bottom

The echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.

The biomass calculation is made in the same way as for **Surface** echograms.

c Pelagic

This echogram is nearly identical to the **Surface** echogram. However, the biomass is calculated in a different manner.

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

Example 5 Biomass calculation

If you are investigating a large school of pelagic fish, set the **Start Range** and **Range** to enclose the school. If the school is large enough, a **Surface** echogram may mistake it for bottom, and the biomass readings will be wrong. The **Pelagic** echogram will however disregard the bottom detection, and give a correct estimate of the biomass.

d Trawl

This echogram covers the vertical opening of the trawl.

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

The biomass calculation is made in the same way as for **Surface** echograms.

Procedure

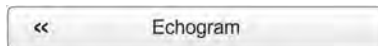
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3 On the **Echogram** tab, choose **Echogram Type**.

Note

*The chosen echogram type will only apply to the currently selected “active” echogram. If you wish the changes to apply to all similar echograms, click **Apply To All**.*

- 4 Click **OK** to save the current settings and close the dialog.

Adding horizontal markers to the echogram

This procedure explains how you can enable one or more horizontal markers in the current echogram.

The echograms provided by the ES70 may be set up to contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 91
- *White line* on page 91
- *Hardness line* on page 92
- *Trawl line* on page 92
- *Variable depth line* on page 93
- *Range other lines* on page 93
- *Biomass line* on page 93
- *Range scales* on page 94
- *Vertical ticks* on page 94
- *Annotations* on page 95

Procedure

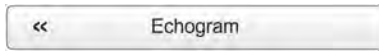
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3 On the **Lines** tab, observe the various markers that can be enabled.
- 4 Enable the lines you wish to see.

Important

The White Line and the Hardness Line can not be used simultaneously.

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

Adding vertical markers and annotations to the echogram

This procedure explains how you can enable one or more vertical markers in the current echogram.

The echograms provided by the ES70 may be set up to contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 91
- *White line* on page 91
- *Hardness line* on page 92
- *Trawl line* on page 92
- *Variable depth line* on page 93
- *Range other lines* on page 93
- *Biomass line* on page 93
- *Range scales* on page 94
- *Vertical ticks* on page 94
- *Annotations* on page 95

Procedure

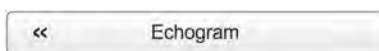
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3 On the **Lines** tab, observe the various vertical markers that can be enabled.

Note

*The annotations are controlled on the **Annotation** dialog, but to place the annotations in the echogram, you must enable them in the **Echogram** dialog.*

- 4 Enable the vertical markers you wish to see.
- 5 Click **OK** to save the current settings and close the dialog.

Selecting TVG gain in the Echogram dialog

The TVG can be chosen using the **Echogram** dialog (described here), or with the **TVG** button on the **Active** menu.

→ *Adjusting the TVG gain on the Active menu* on page 69

TVG means *Time Varied Gain*.

The whole idea with TVG is that echoes from fish shall have the same echo level (colour) independent of their depths.

The ES70 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The ES70 does not have a TVG compensated receiver like most other echo sounders. In the ES70 the TVG is made in software after the echoes from the receiver(s) have been converted to digital format. In order to make this work the receiver must have very large dynamic range.

The following TVG settings are available:

a Power (No TVG)

TVG gain is not implemented. This setting is hardly ever used.

b School (20 log TVG)

This gain setting offers weaker amplification close to the bottom. It has been designed to provide the best echoes for schools. The physical size of a school allows you to detect it even with reduced gain.

c Fish (40 log TVG)

This gain setting provides larger amplification close to the bottom. It has been designed to provide the best echoes from single fish.

d Targets (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional filtering and compensation is implemented. Only echoes detected and interpreted as single fish are shown. The echoes are compensated for their physical position in the beam (beam compensation). This means that fish in the outer region of the beam are adjusted to correct size even though their echoes are weaker.

Note that this **Targets (40 log TVG)** setting is only functional with split beam transducers.

e Target Mix (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional beam compensation is implemented. Echoes detected and interpreted as single fish are adjusted to their correct size according to their physical position in the beam.

Note that this **Target Mix (40 log TVG)** setting is only functional with split beam transducers.

f User (Variable TVG)

This setting allows you to define your own TVG setting.

Procedure

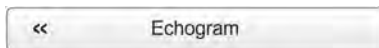
- 1** Click the **Active** icon.

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

→ *Active menu* on page 112



- 2** Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3** On the **Echogram** tab, observe the various TVG settings that can be applied.

→ *TVG gain* on page 123

- 4** Choose your TVG setting.

Tip

The changes made here will by default only be applied to the currently selected “active” echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.

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

Removing interference and vessel's own noise using the 'ping-ping' filter

Kun ES70

The **Active** sub–menu offers a dedicated filter to remove interference and noise from your own vessel, the **Ping-Ping Filter**. This procedure explains how to activate this filter.

This filter was originally developed for our sonars, but has also proven to be very useful in other hydroacoustic systems.

Kun ES70

- 1 Click the **Active** icon.

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



→ *Active menu* on page 112

- 2 Click **Ping-Ping Filter**, and make the adjustments to fit your requirements.

Tip

The changes made here will by default only be applied to the currently selected “active” echogram (identified with a thick border). If you wish to apply the changes to all the other echograms of the same type (for example all bottom related echograms), click **Apply To All**.

Removing interference using sequential pinging

This procedure explains how you can initiate sequential pinging to remove interference. This function is useful if you have multiple transceivers using the same frequency.

The **Sequential pinging** function can be used if you have more than one transceiver in use on the ES70 system. When activated, each individual transceiver will ‘ping’ in sequence, one by one. If two transducers are used on a transceiver, these will ping simultaneously. When not activated, all frequency channels will ‘ping’ simultaneously.

Procedure

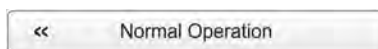
- 1 Click the **Operation** icon.

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



→ *Operation menu* on page 109

- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

- 3 Click to enable **Sequential Pinging**.
- 4 Click **OK** to save the current settings and close the dialog.

Making it easier to see the bottom

The **Echogram** dialog allows you to enable a *Bottom line* or a *White line* to easier identify the bottom. This procedure explains how to enable these features.

The marker lines enabled here are explained in section *Echograms* in chapter *Display view*.

→ *Echogram markers* on page 91

Procedure

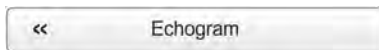
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3 On the **Lines** tab, observe the various lines that can be applied.
- 4 Click **Bottom Line** to enable view.
- 5 Click either **White line** or **Hardness** to select which line to show.
- 6 Click **OK** to save the current settings and close the dialog.

Range procedures

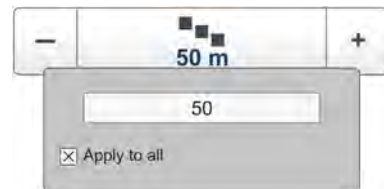
These procedures explain how to change the vertical range, that is how to control the depth to be shown by the echogram.

Topics

- *Choosing start depth* on page 60
- *Choosing automatic start depth* on page 61
- *Choosing the vertical range* on page 62

Choosing start depth

This procedure explains how to control the vertical start range (start depth) in the echogram. The start range is controlled by the **Start Range** button on the **Main** menu.



Example 6 Start Range in a surface related echogram

In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters “below” the bottom.

The bottom contour is easily detected when the depth changes.

Three different methods may be used.

Procedure

1 Method 1:

- a Click [+] or [-] to adjust the start range manually.

2 Method 2:

- a Click the middle of the button, hold the mouse button depressed, and drag sideways.

3 Method 3 can only be used if you have a keyboard:

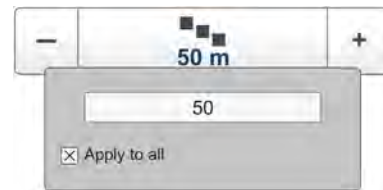
- a Click the middle of the button to open it.
- b Enter any value from the keyboard.

Choosing automatic start depth

This procedure explains how to enable use of the automatic start depth function. The start range is controlled by the **Start Range** button on the **Main** menu.

Note _____

*The **Automatic Start Depth** function will only work in surface related echograms.*



Example 7 Automatic Start Depth

If you set **Range** to 20 meters and enable the **Automatic Start Depth** feature, your echogram will always be drawn to make the bottom contour appear close to the bottom of your echogram presentation. If the water depth exceeds 20 meters, the ES70 will automatically move the start range down. The range is kept, but as the start range is moved, the bottom contour is still visible.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Observe the **Start Range** button.
- 3 Click the middle of the button to open it.
- 4 Click to enable **Automatic Start Depth**.
- 5 Click the middle of the button to close it.

Choosing the vertical range

This procedure explains how to set the vertical range; the distance from the sea surface and down to the bottom. This vertical range is controlled by the **Range** button on the **Main** menu.



Example 8 Start Range and Range in bottom related echogram

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

Two methods can be used.

Procedure

1 Method 1:

- a Click [+] or [-] to adjust the range manually.

2 Method 2:

- a Click the middle of the button to open it.
- b Click any range value (including *Auto* when available) to select it.

Bottom detection procedures

These procedures explain how you can control the bottom detection. **Topics** • *Defining maximum and minimum*

Defining maximum and minimum depths

When you use the ES70 it is very important that it detects and “locks” on the correct depth. Normally this will happen automatically. However, certain conditions (such as noise or air under the hull), or the appearance of large schools of fish, may “fool” the sounder. When the bottom is undetected you will read 0.00 meters depth.

In order to guide the ES70 to locate the correct depth, you may some times find it useful to follow this procedure.

Note

If you set maximum depth to a value identical or smaller than the minimum value, the bottom detection algorithm will be disabled. The ES70 will then not be able to detect the bottom at all, and the displayed depth will be 0.00 m

- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

- 3 Enter a **Minimum Depth**.

This setting eliminates all unwanted bottom detections from the transducer surface and down to the defined depth.

- 4 Enter a **Maximum Depth**.

Set this depth to approximately 50% more than the expected depth. If the ES70 should lose bottom detection due to air or other disturbances, it will try to relocate the depth within the minimum and maximum depths you have defined. Do not exaggerate. If you for example enter 5000 meters and the bottom track is lost, the ES70 will search the entire depth for new bottom lock. This will take a lot of time.

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

Adjusting the bottom detection to find flatfish

The ES70 provides the **Bottom Backstep** parameter in the **Bottom Detector** dialog. You can use this parameter to enhance the detection of sole, flounder and similar species.

→ *Bottom slopes* on page 120

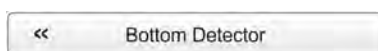
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

- 3 Increase the **Bottom Backstep** level (make it more positive).

A typical setting would be approximately -30 dB, but you will need to experiment to find the best value for the operational frequency and the current bottom and sea conditions.

The ES70 will now provide increased penetration, and show you a detected bottom that is slightly deeper than the actual value. This will cause the flatfish to be shown as if they were located “above” the bottom.

- 4 Click **OK** to save the current settings and close the dialog.

Adjusting the bottom detection to find seagrass

The ES70 provides the **Bottom Backstep** parameter in the **Bottom Detector** dialog. If you have an Olex system, you can use this parameter to enhance the detection of seagrass.

→ *Bottom slopes* on page 120

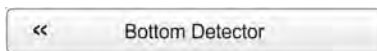
- 1 Click the **Active** icon.

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



→ *Active menu* on page 112

- 2 On the **Active** menu, click **Bottom Detector** to open the **Bottom Detector** dialog.



The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

- 3 Decrease the **Bottom Backstep** level to a lower value (make it more negative).

A typical setting would be approximately -60 dB, but you will need to experiment to find the best value for the operational frequency and the current bottom and sea conditions.

The ES70 will now show you a depth value that is shallower than the actual depth.

- 4 Observe the true depth on the Olex system.

The difference between the two depths indicate the height of the seagrass.

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

Setting up the depth alarms

This procedure explains how to set up depth alarms on the Simrad ES70.

The depth alarms provided by the Simrad ES70 fulfils the requirements made by the International Maritime organization (IMO) for navigational purposes.

An alarm will be triggered if:

- a the current depth is shallower than the minimum alarm depth you have chosen, or
- b the current depth is deeper than the maximum alarm depth you have chosen

A dedicated function allows you to disable the depth alarms all together, while an other option will enable or disable an audible alarm.

When the alarm is triggered, the **Depth Alarms** field changes colour to red. The warning is also provided as a message in the messaging system and - if enabled - as an audio signal.



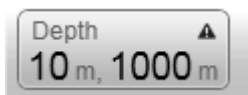
To acknowledge the alarm, click the **Depth Alarms** field to open the dialog. The alarm sound is then automatically disabled. To “restart” the alarm, click to enable **Use Alarm Sound**.

Important

If the bottom detector in the ES70 fails to detect the bottom when the depth alarm is enabled, or if the bottom detector is switched off, the alarm will be triggered independent of the current depths.

Procedure

- 1 Observe the **Depth Alarms** field on the right side of the **Title Bar**.



Double-click the **Depth Alarms** field to open the **Depth Alarms** dialog.

- 2 To activate the alarms:
 - a Define values for minimum and maximum depth.
 - b Click to enable **Use Alarm Sound** if this is desired.
 - c In the table at the bottom of the **Depth Alarms** dialog, click to activate which frequency channel to be used for bottom detection.
The choice you make here will not have any effect on the echograms. You only choose which frequency channel to “feed” the alarm system.
 - d Click **OK** to save the current settings and close the dialog.
- 3 To disable all depth alarms:
 - a Click to choose **Disable Alarms** if this is desired.
 - b Observe that the **Depth Alarms** field changes appearance to indicate your choice.
 - c Click **OK** to save the current settings and close the dialog.
- 4 To disable only minimum or maximum depth alarm:
 - a Set the relevant alarm limit to 0 (zero).
 - b Click **OK** to save the current settings and close the dialog.



Size distribution, biomass and fish density procedures

If you use a “split beam” transducer on your ES70, it will provide you with information about the size distribution and density of the fish beneath the hull.

Topics

- *Monitoring the fish size distribution* on page 66
- *Adjusting the fish length for correct calculations* on page 67
- *Monitoring the current biomass* on page 68
- *Enabling the biomass line* on page 68

Monitoring the fish size distribution

The size distribution is presented using the **Size Distribution** information pane.

→ *Size Distribution information pane* on page 99

The **Size Distribution** information pane shows a histogram of the single fish echoes detected. The calculation is based on the parameters you have selected in the **Calculation Interval** dialog; time, ping or a chosen part of the current view. It thus provides a visual indication on how large the fishes are within the chosen interval.

Only the fishes detected by the current transducer frequency are shown.

The large number above the histogram shows the average size of all the fishes in the histogram. The value is presented in the unit you have chosen in the **Units** dialog. For an accurate x-axis value, place the cursor on a vertical bar in the histogram, and read the value from the label.

The abbreviation TS is commonly used. It means “Target Strength”, and this is a measure of how strong echo the individual fishes in the current echogram generate. The echo strength indicates the size of the fishes. The **Size Distribution** information pane thus provides a mathematical estimate of the sizes of all the chosen fish species in the echogram.

The target strength from a fish varies from specie to specie. To change the fish species, use the **Fish Select** dialog opened on the **Setup** menu.

- 1 Click the **Size Distribution** icon.

The icon is located on the **Title Bar**. It is used to open the **Size Distribution** information pane.

→ *Size Distribution information pane* on page 99



- 2 To change the size of the information pane, click in the bottom right corner, hold the mouse button depressed, and drag.
- 3 To change the transparency of the information pane, open the **Display** menu, and click the **Transparency** button.



- 4 Click on the histogram titles to see the information from the different echograms.
- 5 To change the presentation parameters:
 - a Click the tool button in the top right corner of the information pane to open the **Size Distribution** dialog.
The dialog can also be opened from the **Active** menu.
 - b Make the necessary adjustments.
 - c Click **OK** to save the current settings and close the dialog.
- 6 To change the fish species:
 - a Click the **Setup** icon.
This icon is located under the **Main** menu. It is used to open the **Setup** menu.
→ *Setup menu* on page 111
 - b Click **Fish Select** to open the **Fish Select** dialog.



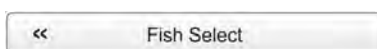
Adjusting the fish length for correct calculations

The ES70 measures and records the target strength (TS). The researchers at the Norwegian Institute for Fishery Research have compiled a set of algorithms based on extensive testing with the various species, and these are used by the ES70 to calculate the length of the fish based on its target strength. However, the target strength differs between the various species. If you find out that the length of the fish you have caught differs from the initial presentation, you can adjust the algorithms used to calculate the length.

Note

Pay special attention to mackerel, as this fish has a very low target strength. Mackerel can often be mistaken for small bait. If you fish for mackerel, we recommend that you use 120 kHz or 200 kHz echo sounder frequencies, as the mackerel shows largest echo strength for these frequencies.

- 1 Click the **Setup** icon.
This icon is located under the **Main** menu. It is used to open the **Setup** menu.
→ *Setup menu* on page 111
- 2 Click **Fish Select** to open the **Fish Select** dialog.



- 3 Make the necessary adjustments.
- 4 Click **OK** to save the current settings and close the dialog.

Monitoring the current biomass

This procedure explains how to open the **Biomass** information pane.

The biomass is presented using the **Biomass** information pane, and/or enabling the **Biomass line**

→ *Biomass information pane* on page 97

→ *Echogram markers* on page 91

- 1 Click the **Biomass** icon.

This icon is located on the **Title Bar**. It is used to open the **Biomass** information pane.

→ *Biomass information pane* on page 97



- 2 To change the size of the information pane, click in the bottom right corner, hold the mouse button depressed, and drag.
- 3 To change the transparency of the information pane, open the **Display** menu, and click the **Transparency** button.



- 4 Click on the histogram titles to see the presentations from the different echograms.

Enabling the biomass line

This procedure explains how to enable the **Biomass line**.

The biomass is presented using the **Biomass** information pane, and/or enabling the **Biomass line**

→ *Biomass information pane* on page 97

→ *Echogram markers* on page 91

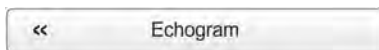
- 1 Click the **Active** icon.

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

→ *Active menu* on page 112



- 2 Click **Echogram** to open the **Echogram** dialog.



The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

- 3 On the **Lines** tab, observe that the biomass can be enabled or disabled, and that you can define a scale for it.
- 4 Make the necessary adjustments.
- 5 Click **OK** to save the current settings and close the dialog.

Gain procedures

These procedures explain how you can adjust the gain in the ES70. This controls how “powerful” the echoes are shown in the echogram. The ES70 uses two principles for gain; *signal amplification* and *time varied gain (TVG)*.

Topics

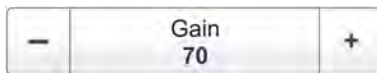
- *Adjusting the signal gain* on page 69
- *Adjusting the TVG gain on the Active menu* on page 69

Adjusting the signal gain

This procedure explains how to change the signal amplification.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 2 Observe the **Gain** button on the **Main** menu.



- 3 **Method 1:**
 - a Click [+] or [-] to choose gain.
- 4 **Method 2:**
 - a Click the middle of the **Gain** button, hold the mouse button depressed.
 - b Drag the cursor left or right to increase or decrease the gain.
- 5 **Method 3** can only be used if you have a keyboard:
 - a Click the middle of the **Gain** button to open the sub-menu.
 - b Enter the requested gain value between 20 and 120.

Adjusting the TVG gain on the Active menu

The TVG can be chosen using the **Echogram** dialog, or with the **TVG** button on the **Active** sub-menu. This second method is described in this procedure.

→ *Selecting TVG gain in the Echogram dialog* on page 57

TVG means *Time Varied Gain*.

The whole idea with TVG is that echoes from fish shall have the same echo level (colour) independent of their depths.

The ES70 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The ES70 does not have a TVG compensated receiver like most other echo sounders. In the ES70 the TVG is made in software after the echoes from the receiver(s) have been converted to digital format. In order to make this work the receiver must have very large dynamic range.



The following TVG settings are available:

a Power (No TVG)

TVG gain is not implemented. This setting is hardly ever used.

b School (20 log TVG)

This gain setting offers weaker amplification close to the bottom. It has been designed to provide the best echoes for schools. The physical size of a school allows you to detect it even with reduced gain.

c Fish (40 log TVG)

This gain setting provides larger amplification close to the bottom. It has been designed to provide the best echoes from single fish.

d Targets (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional filtering and compensation is implemented. Only echoes detected and interpreted as single fish are shown. The echoes are compensated for their physical position in the beam (beam compensation). This means that fish in the outer region of the beam are adjusted to correct size even though their echoes are weaker.

Note that this **Targets (40 log TVG)** setting is only functional with split beam transducers.

e Target Mix (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional beam compensation is implemented. Echoes detected and interpreted as single fish are adjusted to their correct size according to their physical position in the beam.

Note that this **Target Mix (40 log TVG)** setting is only functional with split beam transducers.

f User (Variable TVG)

This setting allows you to define your own TVG setting.

Procedure

1 Click the **Active** icon.

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

→ *Active menu* on page 112



2 Locate the **TVG** button.

3 Method 1:

a Click **[+]** or **[-]** to choose TVG setting.

4 Method 2:

a Click the middle of the **TVG** button to open the sub-menu.

b Click on any TVG setting to select it.

Power and pulse duration procedures

These procedures explain how to control the output power and transmission pulse duration.

Topics

- *Choosing passive mode of operation* on page 71
- *Changing the output power* on page 71
- *Adjusting the pulse duration (length)* on page 72

Choosing passive mode of operation

In order to check how much noise the ES70 is receiving, set it to passive mode. This means that the ES70 is not transmitting sound pulses into the water, it is only “listening”.

Procedure

- 1 Click the **Operation** icon.

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

→ *Operation menu* on page 109



- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

- 3 For the relevant transducer channel, set **Mode** to *Passive*.
- 4 Click **OK** to save the current settings and close the dialog.

Changing the output power

From time to time it may be useful to reduce the output power. A reduced power output may prove beneficial if you are looking for single fishes or schools near the surface, if you work in very shallow waters, if you are bothered with false echoes due to reverberation, or if you simply feel that the echoes are too strong.

Note

If you increase the output power, make sure that you do not choose more power than your transducer can handle. With a correct setup with the transducer registered in the echo sounder software you are safeguarded against this. However, if you use a third party transducer that is not known by the echo sounder software, you may inflict permanent damage if you increase the output to beyond the transducer's capabilities.

Procedure

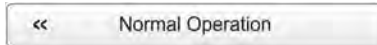
- 1 Click the **Operation** icon.

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

→ *Operation menu* on page 109



- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

- 3 For the relevant transducer channel, set **Power [W]** to requested value.

→ *Output power* on page 125

- 4 Click **OK** to save the current settings and close the dialog.

Adjusting the pulse duration (length)

This procedure explains how to change the pulse length (duration).

Tip

The length of your transmitted pulse is very important to how you can detect fish.

- A short pulse duration gives you a very fine vertical resolution. This allows you to detect scattered fish, and you can find those that move near the bottom.
- A long pulse duration throws a lot more energy into the water, and the digital filters used by the receiver are narrower.

These filters will reduce the ES70's sensitivity for noise, but the length of the transmitted pulse will give you stronger echoes. With the filters, a longer pulse duration will provide longer range, but reduced vertical resolution.

Procedure

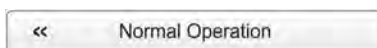
- 1 Click the **Operation** icon.

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

→ *Operation menu* on page 109



- 2 Click **Normal Operation** to open the **Normal Operation** dialog.



The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

- 3 For the relevant transducer channel, set **Pulse Length** to requested value.

For general use, we recommend that the pulse duration is set to *Auto*.

→ *Pulse duration* on page 127

- 4 Click **OK** to save the current settings and close the dialog.

Display views

The display views provided by the Simrad ES70 are based on the award winning design of the Simrad ME70 multibeam echo sounder. The menu system, presentation of data in the operational modes, and the user interface elements, have been created in close cooperation with designers and users.

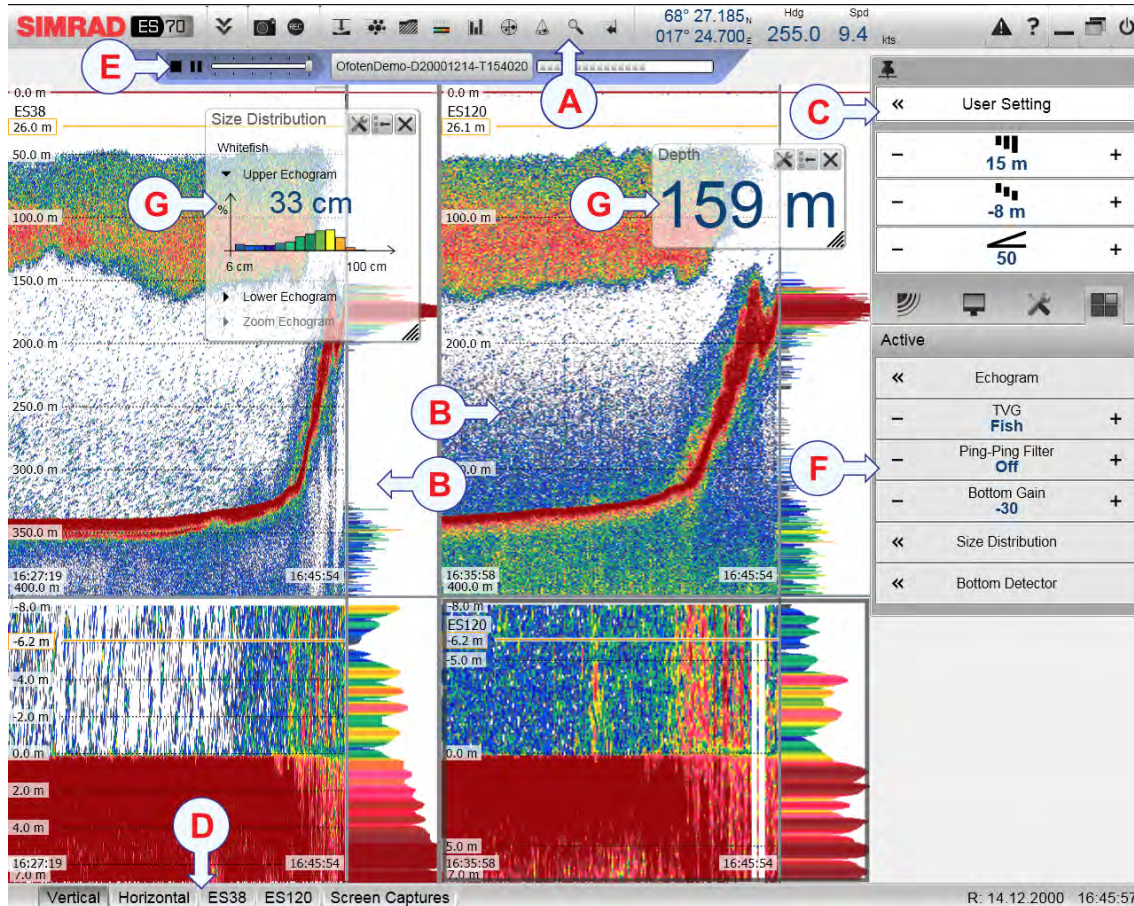
This chapter provides a brief overview of the information displayed by the Simrad ES70, and how the information is organized.

Topics

- *Display organization* on page 75
- *Title Bar* on page 77
- *Replay bar* on page 86
- *Menu system* on page 86
- *Echograms* on page 87
- *Echogram markers* on page 91
- *Information panes* on page 95
- *Status Bar* on page 103
- *Screen captures* on page 105

Display organization

By default, the ES70 display presentation covers the entire screen view.



A typical ES70 display presentation is shown.

A Title Bar

The **Title Bar** identifies the manufacturer's and product logo, and provides several icons and buttons. These are used to hide or retrieve the menu system and the information panes, provide navigational information, and to enable basic system functions.

→ *Title Bar* on page 77

→ *Information panes* on page 95

B Echogram(s)

The **Echogram(s)** take up the largest part of the ES70 display presentation.

By default, you will have two echograms for each frequency channel (transceiver/transducer combination); surface related and bottom related. If you have more than one frequency channels, the echograms for each frequency can be presented horizontally with one over the other, or next to each other. This is controlled by tabs on the **Status bar** (D).

→ *Echograms* on page 87

If you click in an echogram, the echogram is selected to be “active”. The “active” echogram is identified with a thick border. If you change parameters related to the echograms, these are by default only applied to the “active” echogram.

Tip

You can modify the size of the echograms by moving the boundary lines between the echograms. Click on a boundary line, hold the button depressed, and move the line horizontally or vertically.

C Menu system

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



→ *Menu system* on page 86

D Status Bar

The **Status Bar** is located at the bottom of the ES70 presentation.

→ *Status Bar* on page 103

E Replay Bar

F Sub-menus

The sub-menus may be opened from the icons at the bottom of the **Main** menu.



→ *Menu system* on page 86

G Information panes

You can choose from several **Information panes** to provide you with additional data. These panes are selected from the buttons on the **Title Bar**. The panes can be moved around on the echogram presentation, and you can change their sizes. The panes are transparent, so echogram information displayed behind them are not lost.

→ *Information panes* on page 95

Title Bar

The ES70 **Title Bar** is located on the top of the display presentation, and it is stretched from the far left to the far right side.

Topics

- *Purpose and description* on page 77
- *Logo and product name* on page 78
- *Menu button* on page 78
- *Screen Capture button* on page 78
- *Record button* on page 79
- *Event button* on page 79
- *Information pane icons* on page 79
- *Navigation Field* on page 82
- *Depth Alarms* on page 83
- *Function buttons* on page 84

Purpose and description

The purpose of the **Title Bar** is to give you fast access to key functionality and navigational information.

It provides buttons to hide or show the menu, to make a screen capture, to open the **Messages** dialog, and to open the context sensitive on-line help. It also provides a few buttons related to operating system features.

And more important, the **Title Bar** provides the dedicated buttons to open the various information panes.



A Logo and product name.

This element identifies the manufacturer and the product.

B Menu

Click this button to hide or recall the menu system.

C Screen capture, Record and Event

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

D Information panes

Click any of these buttons to open and close an information pane.

E Navigation field

These are not buttons, but information icons providing current data related to the vessel movements.

F Depth Alarms

This field shows you the currently chosen depth alarms.

When the alarm is triggered, the **Depth Alarms** field changes colour to red. The warning is also provided as a message in the messaging system and - if enabled - as an audio signal.



To acknowledge the alarm, click the **Depth Alarms** field to open the dialog. The alarm sound is then automatically disabled. To “restart” the alarm, click to enable **Use Alarm Sound**.

G Function buttons

These buttons are used to control basic system functions.

- **Alarm:** Click this button to open the **Messages** dialog. This button will flash to indicate that a message is posted.
- **Help:** Click this button to open the context sensitive on-line help.
- **Minimize and Resize:** Click these buttons to adjust the size of the ES70 presentation.
- **Exit:** Click this button to close down the ES70 application.

Logo and product name

The **Logo and Product name** is located on the left side of the **Title Bar** at the top of the ES70 presentation.

The Simrad logo and the product name (ES70) is shown.



Double-click the Simrad logo to reduce the size of the ES70 presentation. Double-click one more time to restore the original size.

Menu button

The **Menu** button is located on the left side of the **Title Bar** at the top of the ES70 presentation.

Click once on the **Menu** button to hide the menu, and one more time to bring it back again. When the menu is hidden, it will temporarily be shown on the left or right hand side of the display if you move the cursor to that position.



Related topics

- *The menu system* on page 106

Screen Capture button

The **Screen Capture** button is located on the left side of the **Title Bar** at the top of the ES70 presentation.

Click this button once to create a screen capture of the current echogram presentation. To view the recorded image, click **Screen Capture** on the **Task Bar** to open the image browser.



Related topics

- *Saving a single echogram image* on page 44
- *Recalling single echogram images* on page 46
- *Screen captures* on page 105

Record button

The **Record** button is located on the left side of the **Title Bar** at the top of the ES70 presentation.

Click this button to start and stop recording.

The recording function is set up using the parameters available on the **Record** button on the **Operation** menu.



Remember to stop the recording when you have finished the job! If you forget, your harddisk will soon be full!

Note

Raw data files will normally become very large. If you wish to record large amounts of ES70 raw data, make sure that you have enough space on your hard disk. Unless your computer is equipped with a very large disk capacity, we recommend that you save the raw data to an external storage device.

Related topics

- *Saving echogram sequences (raw data)* on page 44
- *Recalling echogram sequences (raw data)* on page 46

Event button

The **Event** button is located on the left side of the **Title Bar** at the top of the ES70 presentation.

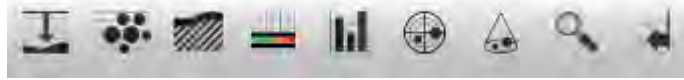
The **Event** button is used to initiate an event annotation on the echogram. To set up the type of event, observe the parameters in the **Annotation** dialog.



Information pane icons

The **Information pane** icons are located on the **Title Bar** at the top of the ES70 display presentation.

The Simrad ES70 offers several information panes to provide additional and detailed data from the echogram. The panes are opened and closed using the information pane icons (buttons) on the **Title Bar**.



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

Important

Some of the information panes are optional. They are thus not available for use unless a license code is available. In order to obtain a license, consult your local dealer.

Depth

Click this button to open and close the **Depth** information pane. This pane provides the current depth as measured by the selected frequency channel (transducer).



Related topics

- *Depth information pane* on page 96

Biomass

Click this icon to open and close the **Biomass** information pane. This pane provides the current biomass as calculated by the echo sounder based on the current echogram.



Important

Biomass is an optional function. In order to activate the **Biomass** information pane and the **Biomass** line, you must obtain a software license.

Related topics

- *Biomass information pane* on page 97

Bottom Hardness

Click this icon to open and close the **Bottom Hardness** information pane. This pane provides the bottom hardness in the current echogram.



Important

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a license.

Related topics

- *Bottom Hardness information pane* on page 98

Colour Scale

Click this icon to open and close the **Colour Scale** information pane. This pane shows you the colours you are presently using in your ES70 presentation. You can also manually modify the colour scale to filter out weak echoes.

**Related topics**

- *Colour Scale information pane* on page 97

Size Distribution

Click this icon to open and close the **Size Distribution** information pane. This pane shows you the size of the fishes currently located in your transducer beam.



Important _____

The **Size Distribution** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

Related topics

- *Size Distribution information pane* on page 99

Fish Position

Click this icon to open and close the **Fish Position** information pane. This pane shows you the position within the beam of the detected single echoes. The beam and the fish echoes are seen from above.



The same echo information is also provided in the **Echo Position** information pane, but the beam is there seen from the side to add the depth perspective.

Important _____

The **Fish Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

Related topics

- *Fish Position information pane* on page 100

Echo Position

Click this button to open and close the **Echo Position** information pane. This pane shows you the position within the beam of the detected single echoes. The beam and echoes are viewed from the side.



The same echo information is also provided in the **Fish Position** information pane, but the beam is there seen from above.

Important

The **Echo Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

Related topics

- *Echo Position information pane* on page 101

Zoom

Click this button to open and close the **Zoom** information pane. This pane allows you to zoom in on a selected area of the current echogram.



Related topics

- *Zoom information pane* on page 101

History

Click this button to open and close the **History** pane. The ES70 automatically and continuously saves the echograms as images in a buffer memory. This pane allows you to view these previously saved images for the currently active echogram.



Related topics

- *History information pane* on page 102

Navigation Field

The navigational information is located on the **Title Bar** at the top of the ES70 display presentation.

These are not buttons, but fields providing useful information related to the vessel movements. You can choose which information is to be displayed if you open the **Display Options** dialog from the **Display** sub-menu.

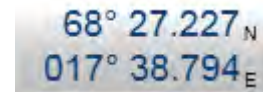
Note

*This navigational information on the **Title Bar** must not be used for navigation!*

Geographical location (latitude and longitude)

The **Geographical location** information is provided in the **Navigation Field** on the **Title Bar** at the top of the ES70 display presentation.

This field on the **Title Bar** displays the vessel's geographical position in longitude and latitude.



68° 27.227_N
017° 38.794_E

The communication with the external GPS system is set up using the **Navigation** button on the **Setup** menu.

Current Heading

The **Vessel Course** information is provided in the **Navigation Field** on the **Title Bar** at the top of the ES70 display presentation.

The communication with the external GPS system, heading sensor or gyro compass is set up using the **Navigation** button on the **Setup** menu.

Current Speed

The **Current Speed** information is provided in the **Navigation Field** on the **Title Bar** at the top of the ES70 display presentation.

Provided that a GPS or speed log system is connected to the ES70, this field on the **Title Bar** will display the vessel's current speed.

The communication with the external GPS system or speed sensor is set up using the **Navigation** button on the **Setup** menu.

Water temperature

The **Water temperature** information is provided in the **Navigation Field** on the **Title Bar** at the top of the ES70 display presentation.

Provided that an suitable sensors is connected to the ES70 to provide the information, the current water temperature can be shown.

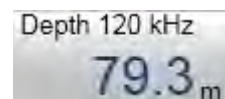


Temp
10.0_{°C}

Current Depth

The **Towbody Depth** information is provided in the **Navigation Field** on the **Title Bar** at the top of the ES70 display presentation.

The current depth for one of the transducers connected to the ES70 can be shown.



Depth 120 kHz
79.3_m

Depth Alarms

The **Depth Alarms** field is located on the right hand side of the **Title Bar** at the top of the presentation.

The depth alarms provided by the Simrad ES70 fulfils the requirements made by the International Maritime organization (IMO) for navigational purposes.



An alarm will be triggered if:

- a the current depth is shallower than the minimum alarm depth you have chosen
- b the current depth is deeper than the maximum alarm depth you have chosen

A dedicated function allows you to disable the depth alarms all together, while an other option will enable or disable an audible alarm.

When the alarm is triggered, the **Depth Alarms** field changes colour to red. The warning is also provided as a message in the messaging system and - if enabled - as an audio signal.



To acknowledge the alarm, click the **Depth Alarms** field to open the dialog. The alarm sound is then automatically disabled. To “restart” the alarm, click to enable **Use Alarm Sound**.

If the depth value is set to 0, the alarm is disabled.

Function buttons

The **Function** buttons are located on the right side of the **Title Bar** at the top of the ES70 presentation.

There are five function buttons at the **Button Field** located at the **Title Bar**.



- *Message button* on page 84
- *Help button* on page 84
- *Minimize button* on page 85
- *Resize button* on page 85
- *Exit button* on page 85

Message button

The **Message** button is located at the right side of the **Title Bar** at the top of the ES70 presentation.

By flashing, this **Message** button indicates when the ES70 system has issued a message.



Click the button to open the **Messages** dialog.

If you hold the mouse cursor over the button, a tooltip rectangle will provide a list of the messages that you have not acknowledged.

Help button

The **Help** button is located at the right side of the **Title Bar** at the top of the ES70 presentation.

Click this button to open the ES70 context sensitive on-line help. The button opens the help system's start page.



Context sensitive on-line help is also available from the various dialogs in the ES70. Click any **Help** button [?] in the top right corner of any dialog to open the help system.

Minimize button

The **Minimize** button is located at the right side of the **Title Bar** at the top of the ES70 presentation.

Click this button to minimize the ES70 display presentation. This is an operating system function.



To restore the presentation to its previous size, click the ES70 button on the operating system's **Status Bar**.

Resize button

The **Resize** button is located at the right side of the **Title Bar** at the top of the ES70 presentation.

Click this button to change the size of the ES70 display presentation. This is an operating system function.



To restore the presentation to its previous size, click the **Resize** button again.

Exit button

The **Exit** button is located at the right side of the **Title Bar** at the top of the ES70 presentation.

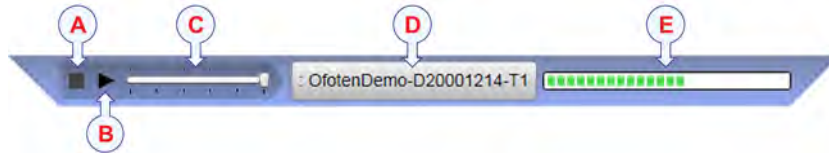
Click this button to close the ES70 program.



Observe the dedicated procedure to power down the ES70 system.

Replay bar

The **Replay Bar** is positioned directly below the **Title Bar**. It is automatically opened once you select *Replay* mode.



- A Stop:** Click this button to stop the playback.
Note that the **Replay Bar** will not be removed from the presentation until you select another operational mode.
- B Play/Pause:** Click this button to start the playback, or to pause it.
- C Replay speed:** Click this slider and move it sideways to adjust the replay speed.
- D File select:** This button shows which file you are currently playing, Click the button to open the **Replay File** dialog.
- E Progress:** This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the green indicators will start from left every time the start of the file appears.

Tip

To start *Replay* mode, use the **Operation** button on the **Operation** menu.

If you wish your playback file to run continuously, click to activate **Loop** in the **Replay File** dialog.

Related topics

- *Operation menu* on page 109

Menu system

The menu system is by default located on the right hand side of the ES70 presentation.

The selection of operational parameters on the ES70 is done using a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialogs or miniature menus to provide additional parameters.

The **Main** menu provides the parameters most frequently used during normal operation.



Below the main menu, dedicated icons are used to open the other menus. These are (from left):



- a** The **Operation** menu controls the main operational parameters.
- b** The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- c** The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- d** The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected view or object.

Tip

You can hide the menu from view if you do not need it. Use the **Menu** button on the **Title Bar**. Click once to hide the menu, click one more time to retrieve it.



The text in the buttons can be changed to suit your preference using the **Language** button on the **Display** menu.

You can place the menu on the left side of the ES70 presentation by means of the **Menu on the right side** option in the **Display Options** dialog.

A detailed breakdown of the commands and parameters available from the menu system is given in the *Menu system* chapter.

Related topics

- *Selecting menu language* on page 41
- *The menu system* on page 106

Echograms

The various echogram types supported by the ES70 are explained.

Topics

- *Surface echogram* on page 88
- *Bottom echogram* on page 89
- *Pelagic echogram* on page 90
- *Trawl echogram* on page 90

Surface echogram

This echogram is related to the sea surface. Start depth (upper echogram boundary) and vertical range (across echogram) are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu.

- A** This is the start depth of the echogram.

In a surface echogram it is normally set up with **Start Range** = 0, or to a small value to start the echogram immediately under the keel or transducer face.

- B** This is the bottom.

The total echogram range (A) to (F) is defined with the **Range** button on the **Main** menu. Unless specific conditions apply, or you wish to control the range manually, use **Range** = *Auto*.

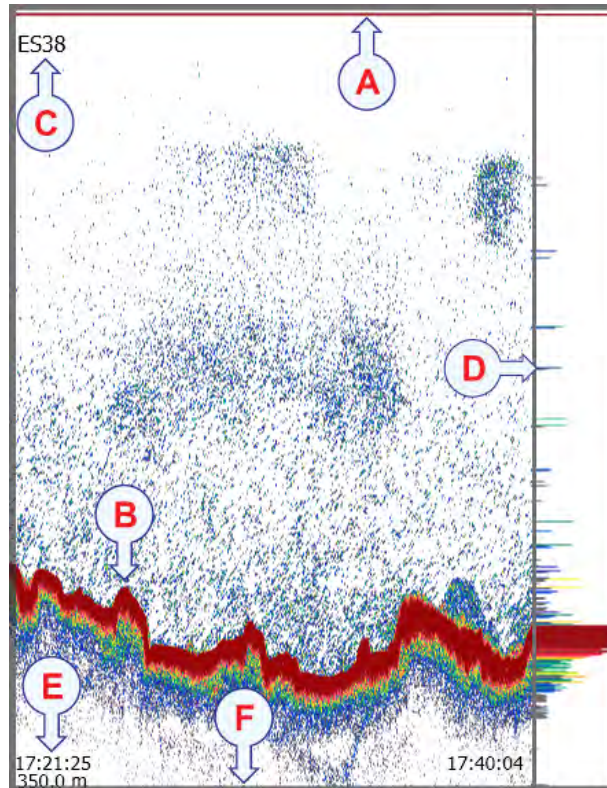
- C** This text identifies the transducer used to create the echogram.

- D** This is the scope view.

This view presents individual colour lines. The colour and length of each line reflects the received echo amplitude.

- E** By default, the “ping time” and the depth range is shown in the bottom left side of the echogram. In the bottom right corner, the “ping time” is the same as current. This information can be changed using the options on the **Horizontal Axis** tab in the **Echogram** dialog.

- F** This is the lower end of the depth range. It is normally a few meters below the bottom contour, depending on the chosen range.



Example 9 Start Range in a surface related echogram

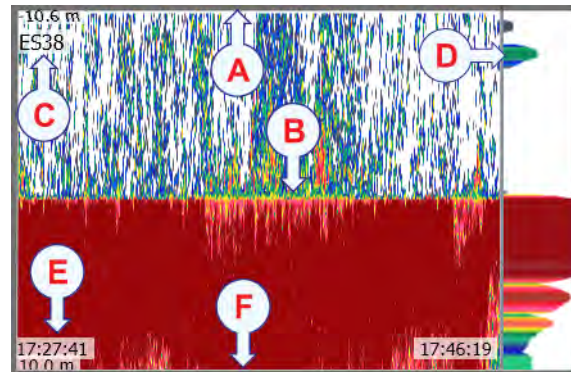
In a surface echogram, set the **Start Range** value to 0 meters. This will make the echogram start from the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from the sea surface and down to 20 meters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

The biomass is automatically calculated based on choices you make in the **Calculation Interval** dialog; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **Range** and **Start Range** settings), the resulting area is used for the biomass calculation. If the seabed is clearly defined with a unique bottom detection, the bottom echo will not be included in the calculations. Therefore, if you switch the bottom detector off, the bottom echo will be included in the calculation.

Bottom echogram

This echogram is related to the detected bottom. Stop depth (lower echogram boundary) and vertical range are manually selected by the **Start Depth** and **Range** buttons on the **Main** menu. The echogram is only drawn for pings having a successful bottom detection.



A This is the start depth of the echogram.

In a bottom echogram it is normally set up with **Start Range** set to a relative small negative value. The value defines how many meter above the bottom the echogram will start.

B This is the bottom.

Since the echogram is related to this bottom, it appears to be flat. Fishes close to the bottom is then easy to see.

The range from the start depth above the bottom and down to some distance below the actual bottom is defined with the **Range** button on the **Main** menu.

C This text identifies the transducer used to create the echogram.

D This is the scope view.

This view presents individual colour lines. The colour and length of each line reflects the received echo amplitude.

E By default, the “ping time” and the depth range is shown in the bottom left side of the echogram. In the bottom right corner, the “ping time” is the same as current. This information can be changed using the options on the **Horizontal Axis** tab in the **Echogram** dialog.

F This is the lower end of the depth range. It is normally a few meters below the bottom contour, depending on the chosen range.

Example 10 Start Range and Range in bottom related echogram

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

The biomass calculation is made in the same way as for **Surface** echograms.

Pelagic echogram

The pelagic echogram appears very similar to the surface echogram. However, the biomass calculations are not limited by the bottom detection.

Example 11 Start Range in a pelagic echogram

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

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

Trawl echogram

The echogram covers the vertical opening of the trawl with reference to the depth of the headrope.

In addition to the trawl opening, the echogram covers a certain range over and under the trawl opening. This range is set by adjusting the **Range** and **Start Range** parameters.

Trawl sensor systems (typically Simrad ITI and PI) communicate headrope depth, as well as the distance from the headrope to the footrope (trawl opening), to the ES70 at regular intervals. This information is required for the trawl echogram to be generated. Without the depth of the headrope, the echogram will appear like a standard pelagic echogram controlled by the **Range** and **Start Range** parameters.

The distance from the headrope to the footrope (trawl opening) can be manually set in the **Trawl** dialog. This is useful for trawl sensor systems not measuring the trawl opening, or when the measured distance is unreliable. The **Trawl** dialog also allows you to enter the distance from the vessel to the trawl opening. The depth of the headrope must however be provided by the catch monitoring system.

In the **Trawl** dialog you can also define the distance from the vessel to the trawl opening.

Example 12 Start Range and Range in a trawl echogram

In a trawl echogram, set the **Start Range** value to –5 meters. This will make the echogram start from 5 meters above the headrope. If the trawl opening is 20 meters, set **Range** to 30 meters. The echogram will now show the area from 5 meters above the headrope, down across the trawl opening, and down to 5 meters below the footrope. On a pelagic trawl, the bottom contour is normally not shown with these settings. On a bottom trawl, the bottom contour is shown once the trawl opening is less than 5 meters over the bottom.

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

Echogram markers

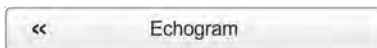
The echograms provided by the ES70 may contain additional information. The following lines, markers and annotations can be enabled.

Topics

- *Bottom line* on page 91
- *White line* on page 91
- *Hardness line* on page 92
- *Trawl line* on page 92
- *Variable depth line* on page 93
- *Range other lines* on page 93
- *Biomass line* on page 93
- *Range scales* on page 94
- *Vertical ticks* on page 94
- *Annotations* on page 95

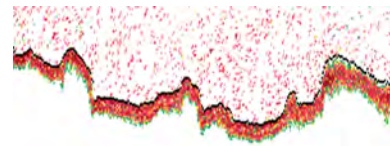
Bottom line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



The bottom contour may be enhanced by adding a bottom line.

The bottom line appears as a black line, and follows the bottom contour.

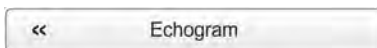


Related topics

- *Adding horizontal markers to the echogram* on page 55

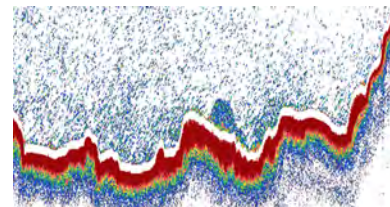
White line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



The bottom contour may also be enhanced by adding a white line.

The white line is an extra thick white line that is added to just below the bottom. The white line will not remove information, it will simply “push” the information further down in order to make the bottom easier to see.



Important

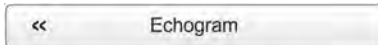
The white line can not be used simultaneously with the hardness line.

Related topics

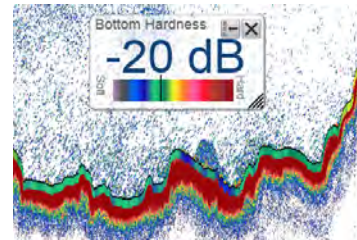
- *Adding horizontal markers to the echogram on page 55*

Hardness line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



The bottom reflectivity (how “hard” it is) may be monitored using the **Hardness** line.



The **Hardness** line is an extra thick colour coded line that is added to just below the bottom. The line will not remove information, it will simply “push” the information further down in order to make the bottom easier to see. The colour coding contains the hardness information.

You may find it useful to open the **Bottom Hardness** information pane to observe the scale. The colours on the left side of the scale indicate a soft bottom, while the colours on the right hand side indicate a harder bottom. The information pane also provides the current reflectivity measured in dB.

Important

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a license.

Important

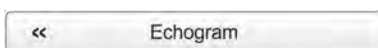
The white line can not be used simultaneously with the hardness line.

Related topics

- *Bottom Hardness information pane on page 98*
- *Adding horizontal markers to the echogram on page 55*

Trawl line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



Whenever available and connected, trawl systems (PI and ITI) communicate headrope depth and/or headrope-to-footrope distance to the ES70 at regular intervals. The information from these sensors are drawn as horizontal lines on the ES70 echogram.

Related topics

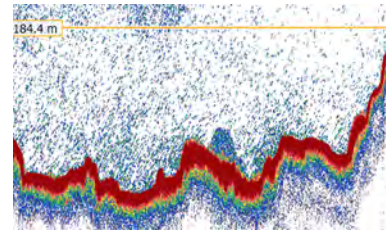
- *Adding horizontal markers to the echogram on page 55*

Variable depth line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



When enabled a horizontal depth line is placed wherever you click in the echogram. This is typically used to measure the water depth, the depth of a school, or even single fish.



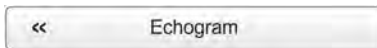
You can click on the line, keep the mouse button depressed, and then drag the line up or down.

Related topics

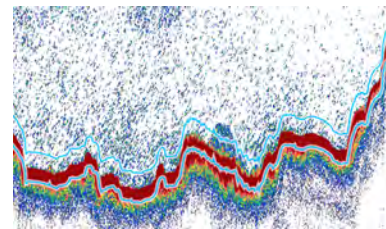
- *Adding horizontal markers to the echogram* on page 55

Range other lines

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



This feature is used when you set up your ES70 with both a surface related and bottom related echogram shown simultaneously.



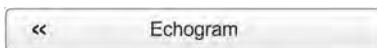
When enabled, two horizontal lines in the surface echogram indicate the range selected in the bottom echogram.

Related topics

- *Adding horizontal markers to the echogram* on page 55

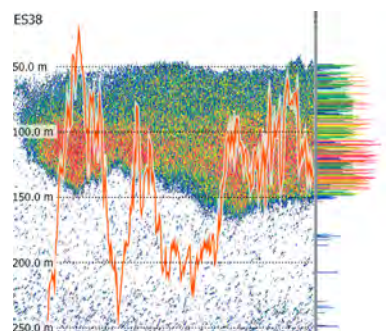
Biomass line

This line marker is enabled in the **Echogram** dialog on the **Active** menu.



The biomass may be monitored using the **Biomass** line.

The biomass line is an extra thick brightly coloured line that is added to the echogram. The line will identify the variations in biomass.



You can change the scale of the curve to fit the vertical space available on the echogram. The scale is provided in the **Echogram** dialog.

The changes made in the **Calculation Interval** dialog will not have an effect on the **Biomass** line.

Remember that you can also measure the biomass using the **Biomass** information panel.

Important

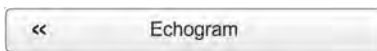
Biomass is an optional function. In order to activate the **Biomass** information pane and the **Biomass** line, you must obtain a software license.

Related topics

- *Biomass information pane* on page 97
- *Adding horizontal markers to the echogram* on page 55

Range scales

Horizontal range scales in the echogram can be enabled in the **Echogram** dialog.



When enabled, equidistant horizontal scale lines are drawn inside the echogram in the current foreground colour; black during day and white during night.

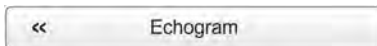
A maximum of 10 scale lines can be selected.

Related topics

- *Adding horizontal markers to the echogram* on page 55

Vertical ticks

Vertical ticks in the echogram can be enabled in the **Echogram** dialog.



The following types of vertical ticks are available in the **Echogram** dialog.

a None

No vertical markers are shown.

b Time

This option places a short vertical line in the upper part of the echogram once every specified number of minutes.

c Distance

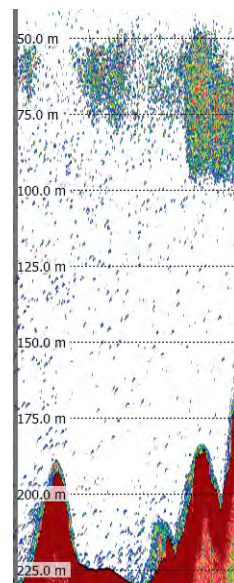
This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

d Annotations

Select *Text* or *Line* to allow annotations to be displayed in the echogram view.

→ *Annotations* on page 95

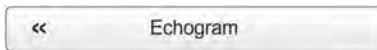
If you select *Line*, the text annotation will be followed by a vertical line for improved visibility.



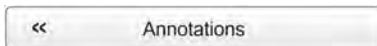
The annotations are controlled by the **Annotations** dialog.

Annotations

In order to see the annotations on the echogram, they must be enabled in the **Echogram** dialog.



The type of annotation is controlled in the **Annotation** dialog.



Annotations may be added to the echogram to pinpoint special echoes, special events, etc. An annotation can be entered manually using the **Annotation** dialog, or they can be imported from peripheral devices.

The annotations defined are stored with the raw data as annotation datagrams.

Annotations can only be added during normal operation.

Information panes

The Simrad ES70 offers several information panes to provide additional and detailed data from the ES70 presentation.



The information panes are opened and closed using the icon buttons on the **Title Bar**.

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

Important

Some of the information panes are optional. They are thus not available for use unless a license code is available. In order to obtain a license, consult your local dealer.

Topics

- *About information panes* on page 96
- *Depth information pane* on page 96
- *Biomass information pane* on page 97
- *Colour Scale information pane* on page 97
- *Bottom Hardness information pane* on page 98
- *Size Distribution information pane* on page 99
- *Fish Position information pane* on page 100

- *Echo Position information pane* on page 101
- *Zoom information pane* on page 101
- *History information pane* on page 102

About information panes

You can change the size of the information pane to suit your preferences, and you can move it within the echogram presentation it is valid for.

- To change its size, click on the shaded area in the bottom right corner, hold the mouse button depressed, and drag to requested size.
- To move an information pane, just click inside it, hold the mouse button depressed, and move it to requested position.

The information panes are transparent, so you can safely place a pane on top of the echogram without losing the information behind it. The degree of transparency is controlled by the **Transparency** button on the **Display** menu.



All information panes are provided with small buttons in the top right corner.

- The top right button [X] closes the information pane.
Note that you can also close the pane if you click one more time on its button on the **Title Bar**.
- The other button will restore the information pane to its original size and location.
- Some of the information panes are provided with a “tool” button. This buttons opens a dialog relevant to the information shown in the pane.

Depth information pane

To open this information pane, click the **Depth** icon on the **Title Bar**.



The **Depth** information pane displays the current depth for the chosen transducer and frequency.



The **Tool** button in the information pane opens the **Bottom Detector** dialog. This dialog is also available from the **Active** menu.

The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

Related topics

- *Active menu* on page 112

Biomass information pane

To open this information pane, click the **Biomass** icon on the **Title Bar**.

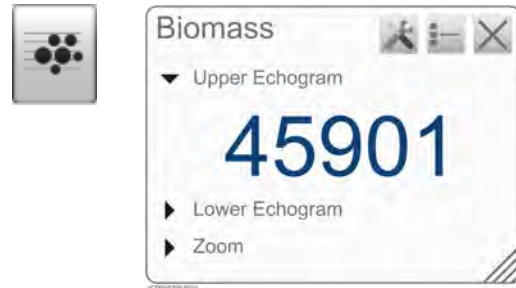
The **Biomass** information pane displays the current biomass. The calculation is based on the selection you have made in the **Calculation Interval** dialog; time, ping or a chosen part of the current view.

Only the biomass calculated for the current transducer and frequency is shown.

The **Tool** button opens the **Calculation Interval** dialog. This dialog is also available from the **Setup** menu.

Important

Biomass is an optional function. In order to activate the **Biomass** information pane and the **Biomass** line, you must obtain a software license.



Parameters

- **Upper Echogram**

This biomass value is calculated from the fish echoes from the top echogram for the chosen channel.

By default, this is a surface echogram.

- **Lower Echogram**

This biomass value is calculated from the fish echoes from the bottom echogram for the chosen channel.

By default, this is a bottom echogram.

- **Zoom**

This biomass value is calculated from the fish echoes from the currently zoomed area.

Related topics

- *Biomass line* on page 93
- *Monitoring the current biomass* on page 68
- *Enabling the biomass line* on page 68
- *Biomass* on page 119

Colour Scale information pane

To open this information pane, click the **Colour Scale** icon on the **Title Bar**.

The **Colour Scale** pane displays the current colour scale you are using for the echogram presentation.



To change the colour scale, click **Colour Setup** on the **Display** menu.



12 colours

Sonar colours (64)

Echosounder colours (64)

Grayscale (64)

BI500 colours (64)



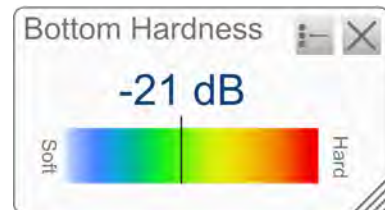
The *Echosounder colours* scale is based on the standard 12-colour scale, but additional colours have been added between these to make smoother colour transitions.

Related topics

- *Selecting colour scale and presentation palette* on page 50
- *Changing the colour scale to remove the weakest echoes* on page 51

Bottom Hardness information pane

To open the **Bottom Hardness** information pane, click the **Bottom Hardness** icon on the **Title Bar**.



Important _____

Please note that bottom hardness is an optional function. In order to activate the **Hardness** line and the **Bottom Hardness** information pane, you must obtain a license.

The **Bottom Hardness** information pane displays the current bottom reflectivity. This gives an indication to how hard the bottom is. The value is calculated using the bottom echo strength in the current ping.

The vertical line in the hardness colour scale positions the current ping. The hardness of the current ping is also shown with the numerical value.

The bottom hardness can also be indicated by enabling the bottom hardness line in the **Echogram** dialog. This line uses the same colour coding as the information pane, but places this as a thick line immediately under the bottom line in the echogram.

Related topics

- *Hardness line* on page 92

Size Distribution information pane

To open the **Size Distribution** information pane, click the **Size Distribution** icon on the **Title Bar**.



Important

The **Size Distribution** information pane is only available if your ES70 is equipped with one or more split beam transceivers.



The **Size Distribution** information pane shows a histogram of the single fish echoes detected. The calculation is based on the parameters you have selected in the **Calculation Interval** dialog; time, ping or a chosen part of the current view. It thus provides a visual indication on how large the fishes are within the chosen interval.

Only the fishes detected by the current transducer frequency are shown.

The large number above the histogram shows the average size of all the fishes in the histogram. The value is presented in the unit you have chosen in the **Units** dialog. For an accurate x-axis value, place the cursor on a vertical bar in the histogram, and read the value from the label.

The abbreviation TS is commonly used. It means “Target Strength”, and this is a measure of how strong echo the individual fishes in the current echogram generate. The echo strength indicates the size of the fishes. The **Size Distribution** information pane thus provides a mathematical estimate of the sizes of all the chosen fish species in the echogram.

The target strength from a fish varies from specie to specie. To change the fish species, use the **Fish Select** dialog opened on the **Setup** menu.

Parameters

1 Fish species

The current fish species, as selected in the **Fish Select** dialog, is shown.

2 Echogram

You can see size distribution histograms from three different sources.

- **Upper Echogram**

This histogram is created based on fish echoes from the top echogram for the chosen channel. By default, this is a surface echogram.

The data is calculated based on the selection you have made in the **Calculation Interval** dialog.

- **Lower Echogram**

This histogram is created based on fish echoes from the bottom echogram for the chosen channel. By default, this is a bottom echogram.

The data is calculated based on the selection you have made in the **Calculation Interval** dialog.

If you have selected only a small vertical range close to bottom, the histogram may be empty. This because the fish volume is small due to the limited range selected, and because the target strength algorithm must take into consideration other bottom echoes than fish.

- **Zoom**

This histogram is created based on fish echoes from the currently zoomed area.

3 Mean value

The large number above each histogram is the mean value from the tallest bar. The unit reflects the mode chosen in the **Size Distribution** dialog.

To change the settings in the histogram, click **Size Distribution** on the **Active** menu.

The **Size Distribution** dialog allows you to shape the histogram in the **Size Distribution** information panel to your own requirements. You can set up the mode, the upper and lower limits, the accuracy, and the vertical resolution.

Related topics

- *Monitoring the fish size distribution* on page 66

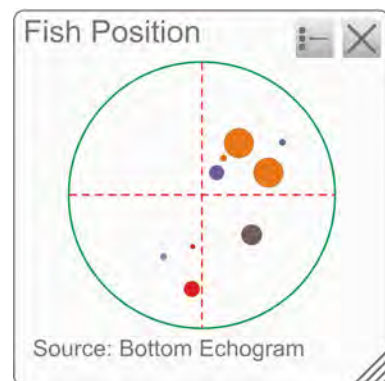
Fish Position information pane

To open this information pane, click the **Fish Position** icon on the **Title Bar**.

The **Fish Position** information pane 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 view is “from above”. The colours indicate the echo strength.

Important _____

The **Fish Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.



Parameters

1 Source

This is the source of the fish position information. In the example, the surface echogram is used to determine the latest fish positions.

Echo Position information pane

To open the **Echo Position** information pane, click the **Echo Position** icon on the **Title Bar**.

Important

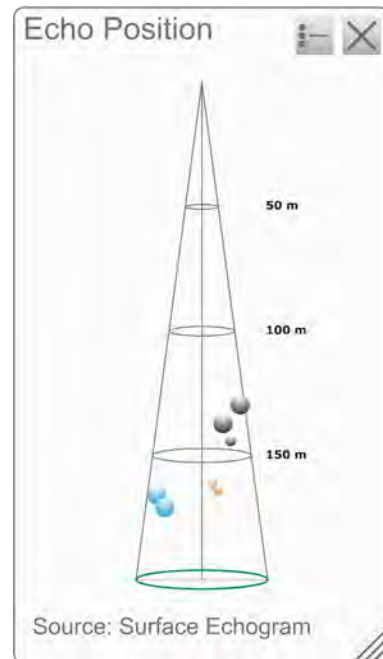
The **Echo Position** information pane is only available if your ES70 is equipped with one or more split beam transceivers.

The **Echo Position** pane 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 colours indicate the echo strength. This is basically the same view as the **Fish Position**, however the echoes are here viewed from the side and not from above.

Parameters

1 Source

This is the source of the echo position information. In the example, the surface echogram is used to determine the latest echo positions.

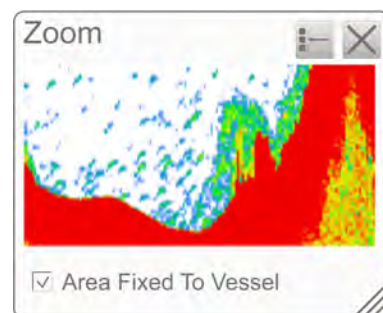


Zoom information pane

To open the **Zoom** information pane, click the **Zoom** icon on the **Title Bar**.

The **Zoom** information pane allows you to zoom in on a chosen area on the current echogram.

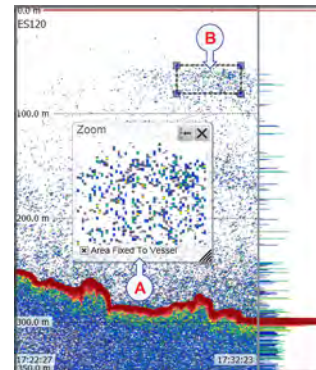
Once the **Zoom** information pane is opened, the zoomed area is visible as a dotted rectangle on the echogram. You can change this zoomed area to any size and shape, the echoes inside the zoomed area will always be shown in the **Zoom** information pane.



Example 13 Zoom information pane

- A** Zoom information pane
- B** Zoomed area rectangle

In this example, the zoomed area rectangle is positioned directly above the **Zoom** information pane. If you click on any of the four corners of the rectangle, you can drag it to any size and shape.



Parameters

1 Area Fixed To Vessel

When the rectangular zoomed area is established, it can either follow the echogram while it moves towards the left, or it can stay put.

When **Area Fixed To Vessel** is active, the zoomed area will be permanently positioned on the echogram. The echoes will then run through the area, and thus also through the **Zoom** information pane.

History information pane

Click the **History** icon on the **Title Bar** to enable this function.

The **History** information pane does not use the same presentation method as the other panes. The function allows you to view previously recorded echogram sequences. In order to do this, the current “active” echogram is split in two, and the left side is used to display the recorded history.

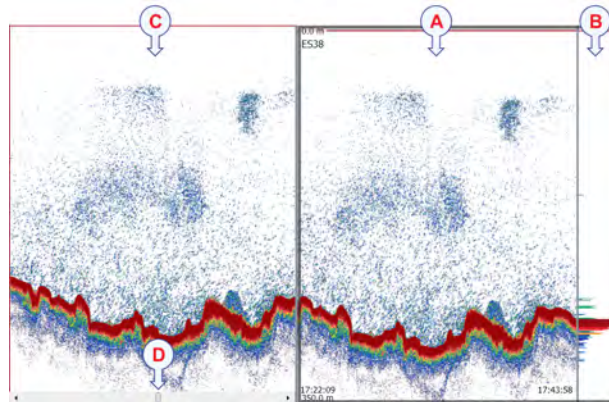


This function is used to store echograms on bitmap format. The ES70 will continuously save echogram pictures to its internal hard disk. These can be recalled on the display. The information in the **History** presentation is the same as on the original echogram presentation.

The number of history files is limited. After reaching the maximum number of files, the newest echogram picture overwrites the oldest one. The history function still allows you to quickly look through echogram pictures covering several hours.

Example 14 History information pane

- A** *The original “active” echogram presentation*
- B** *The original scope view presentation*
- C** *The History presentation*
- D** *Click this button and drag sideways to scroll through the recorded images*



Tip _____

The horizontal width of the history presentation can be adjusted by clicking the right border, and dragging it sideways.

Status Bar

The **Status Bar** is located at the bottom of the ES70 presentation.

The purpose of the **Status Bar** is to give you fast access to key functionality, as well as time and date information.



A Presentation format

- **Vertical:** This tab places your current echograms next to each other in a vertical presentation.
- **Horizontal:** This tab places your current echograms on top of each other in a horizontal presentation.

If only one active frequency channel is in use, you will have only one echogram. These tabs are then not shown.

B Transducer selection

These tabs on the **Status Bar** reflect the actual transducers used by the ES70. The two transducers shown here are just an example. If only one transducer is in use, you will have only one echogram. These tabs are then not shown.

- **ES38:** This tab allocates the ES70 presentation to only show the echogram from this transducer.
- **ES120:** This tab allocates the ES70 presentation to only show the echogram from this transducer.

C Screen Captures

This tab on the **Status Bar** hides the current “live” echograms from view, and allows you to see the echogram images you have previously saved using the **Screen Capture** button on the **Title Bar**.

The echograms are presented in a graphic browser. You can open any of the images for a closer study, or you can access the files directly by clicking the **Open Image Folder** button.

→ *Title Bar* on page 77

→ *Screen captures* on page 105

D Colour scale

This colour bar on the **Status Bar** presents the currently selected colour scale.

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and experience. Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

If you choose to use 64 colours, the resolution of the ES70 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

To change the colour scale, use the **Colour Setup** dialog on the **Display** menu. You can also access the colour scale using the **Colour Scale** information pane.

→ *Colour Scale information pane* on page 97

E Date

This field on the **Status Bar** presents the current date.

Note that during replay, the date of the replay file is shown. An “R” is displayed in front of the date to identify this.

F Time

This field on the **Status Bar** presents the current time.

Note that during replay, the time in the replay file is shown.

Related topics

- *Title Bar* on page 77
- *Screen captures* on page 105
- *Colour Scale information pane* on page 97

Screen captures

The ES70 provides a built-in screen capture function to create snapshots of the echogram presentation. The ES70 also provides a dedicated browser to view the saved images.



To save an echogram, click the **Screen Capture** button on the **Title Bar**.

To view the recorded images, click the **Screen Capture** button on the **Status Bar**. This will open the image browser.



The browser simply presents a miniature version of each screen capture that you have made. Each file is provided in standard JPG format, which can be opened by all standard bitmap editors. The file names are created automatically using the date and time you clicked the **Screen Capture** button.

Double-click a miniature image to open it. Once opened, click **Return to Browser** to return to the browser view.

In the browser, click **Open Image Folder** to open the operating system folder containing the files. This folder offers operating system functionality to provide renaming, copying, printing and deleting files.

The menu system

The menu navigation employed by the ES70 is similar to the other Simrad applications which follow the new user interface standards developed by Simrad.

The main menu is by default located at the right side of the screen. By means of dedicated icons at the bottom of the main menu, you can open and close the relevant sub-menus. Menu choices shown in dark colours are not available for the current operation or operational mode.

Topics

- *About menus and buttons* on page 106
- *Main menu* on page 108
- *Operation menu* on page 109
- *Display menu* on page 110
- *Setup menu* on page 111
- *Active menu* on page 112

About menus and buttons

The selection of operational parameters on the ES70 is done using a tree structure with a main menu, a set of secondary menus, and several menu buttons. Some of the menu buttons open dialogs or miniature menus to provide additional parameters.

The **Main** menu provides the parameters most frequently used during normal operation.

Below the main menu, dedicated icons are used to open the other menus. These are (from left):



- a** The **Operation** menu controls the main operational parameters.
- b** The **Display** menu controls the visual aspects of the system, such as parameters related to the display presentation.
- c** The **Setup** menu allows you to control the configuration of the signal processing, as well as system installation and maintenance, and the interfaces to peripheral devices.
- d** The **Active** menu has its content linked to the current active item (view or object). Use it to access special features available for the selected view or object.

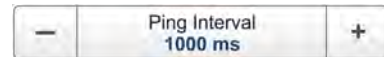
Button types

Each menu contains several menu buttons. Each button shows the function of the button, some of them also display the current parameter setting. The majority of the buttons in each menu provide one or more of these functions.

- You can increase and decrease parameter values by clicking the [+] and [-] fields on the button.
- You can change parameter values by clicking on the button, holding the mouse depressed, and then moving the cursor sideways.
- You can change parameter values by means of the scroll wheel on the mouse or trackball.
- You can enter parameter values from the keyboard (if you have one).
- You can select parameter value from the button's sub-menu.
- You can open a dedicated dialog.

How to select a numerical parameter using the +/- buttons

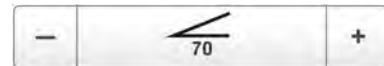
- 1 Move the cursor to either side of the button, and observe that the background colour changes.



- a Click on the left side of the button to decrease the numerical value.
- b Click on the right side of the button to increase the numerical value.

How to select a numerical parameter by moving the cursor horizontally

- 1 Place the cursor on the middle of the button.
- 2 Click and hold the left mouse button depressed.
- 3 Move the cursor horizontally: left to decrease the parameter value, or right to increase it.
- 4 Release the mouse button when the requested value is shown.



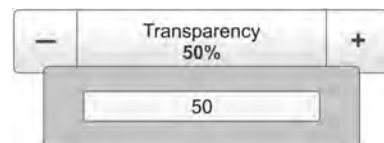
How to select a numerical parameter by means of the scroll wheel

- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the parameter value.
- 3 Release the scroll wheel when the requested value is shown.



How to select a numerical parameter using the keyboard

- 1 Click the middle section of the button to open a text field.
- 2 Enter the numerical value into the text field.



If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red. You will then not be able to enter the value.

- 3 Press the **Enter** key.

How to select a parameter using a sub-menu

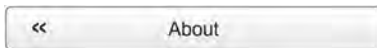
- 1 Click the middle section of the button to open a sub-menu, then click the requested parameter value.

The chosen value is applied, and the sub-menu is automatically closed.



- 2 Whenever applicable, you can also access the sub-menu by clicking the left and right side of the button. This method will not show you the parameter choices.
 - a Click on the left side of the button to select a 'lower' sub-menu choice.
 - b Click on the right side of the button to select a 'higher' sub-menu choice.

How to select parameters using a dialog



- 1 Click anywhere on the button to open a separate dialog.

Main menu

The following functions and parameters are available from the **Main** menu.

1 User Settings

The **User Settings** dialog allows you to save the current user settings (parameter selections), and to retrieve previously saved factory or user settings.



2 Range

The **Range** function allows you to specify the vertical range of the water column covered by the echogram. The range is defined from a selected start range, and down to a value beneath the current bottom depth. The value shown and selected is by default applied only to the currently selected echogram.

3 Start Range

The **Start Range** function allows you to specify the start depth of the echogram, that is from which depth in the water column the presentation shall start. The value shown and selected is applied to the currently selected echogram type.

In a surface related echogram, you can click **Automatic Start Depth** to allow the ES70 to select the start range automatically.

4 Gain

The purpose of the **Gain** function is to adjust the echo level in the echogram presentations.

Secondary menus

The bottom of the **Main** menu holds the icons for the secondary menus. Click on one of these icons to open the requested menu.



Menu button

On the **Title bar**, click once on the **Menu** button to hide the menu.



Click one more time to bring the menu back again.

When the menu is hidden, it will temporarily be shown on the left and right hand side of the display if you move the cursor to that position.

Tip

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Operation menu

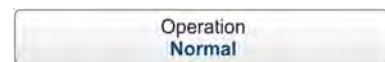
The following functions and parameters are available from the **Operation** menu.



Click once on the icon under the **Main** menu to open the **Operation** menu. Click one more time on the icon to close the menu.

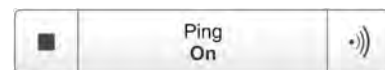
1 Operation

The purpose of the **Operation** function is to control the operational mode of the ES70. You can set it to *Normal*, *Replay* or *Inactive*.



2 Ping

The purpose of the **Ping** function is to enable or disable the ES70 audio transmissions into the water (“pinging”).



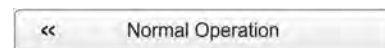
3 Ping Mode

The **Ping Mode** function is used to control how often the ES70 shall transmit its energy into the water. For normal use, choose *Maximum*. This will allow the ES70 to transmit continuously and as often as possible.



4 Ping Interval

Use the **Ping Interval** function to choose the time (in milliseconds) between each transmission (ping) when **Ping Mode** is set to *Interval*.



5 Normal Operation

The purpose of the **Normal Operation** dialog is to offer you an overview of the current transceiver parameters, and to provide you with the ability to change them.

6 Record

The **Record** function allows you to record the unprocessed transducer signals, and save them on the internal hard disk. The files can later be copied or moved to other recordable media.

Tip

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Display menu

The following functions and parameters are available from the **Display** menu.

Click once on the icon under the **Main** menu to open the **Display** menu. Click one more time on the icon to close the menu.



1 Colour Setup

The purpose of the **Colour Setup** dialog is to control the presentation colours used by the ES70.

2 Screen Brightness

The purpose of the **Screen Brightness** function is to adjust the intensity of the light given off by the display.

3 Units

The purpose of the **Units** dialog is to control the unit of measurements used by the ES70.

4 Transparency

The purpose of the **Transparency** function is to adjust how much you are able to see through the information panes.

5 Language

The purpose of the **Language** function is to select the language to be used on the menus.

6 Layout

The purpose of the **Layout** dialog is to define which transceiver channels you wish to present on the display presentation. You can also position the echograms in relation to each other.



7 Display Options

The purpose of the **Display Options** dialog is to control the location of the menu, and which information to be provided on the **Title Bar** and the **Status bar**.

It also controls which tooltips to display.

8 About

The **About** dialog allows you to see the current ES70 software version.

Tip

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Setup menu

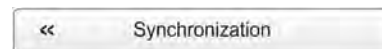
The following functions and parameters are available from the **Setup** menu.

Click once on the icon under the **Main** menu to open the **Setup** menu. Click one more time on the icon to close the menu.



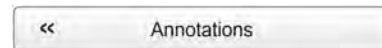
1 Synchronization

The purpose of the **Synchronization** dialog is to set up the ES70 to operate alone, or as a master or slave in a synchronized system. Synchronization is required in order to avoid interference if the ES70 is used simultaneously with other hydroacoustic instruments within the same frequency range.



2 Annotations

The purpose of the **Annotations** dialog is to allow you to enter comments and annotations into the echograms.



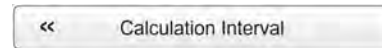
3 Fish Select

The parameters in the **Fish Select** dialog allows you to select the fish species, and to modify the fish size distribution manually.



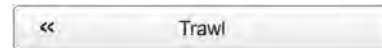
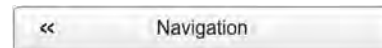
4 Calculation Interval

The **Calculation Interval** dialog allows you to define the time, number of pings, or part of the echogram view used to calculate the biomass and the size distribution.



5 Navigation

The **Navigation** dialog controls how the ES70 receives information from external peripherals, such as navigation and gyro compass systems.



6 Trawl

The **Trawl** dialog allows you to enter the main parameters related to the trawl. Trawl information is used for display of upper and lower trawl line in the echogram. All received speed data are stored to file when recording of raw data to file is enabled.

7 Ethernet Output

The purpose of the **Ethernet Output** dialog is to define the communication parameters for the EK500 datagram output on the Ethernet port.

8 Depth Output

The **Depth Output** dialog is used to set up the output of depth data from the ES70 to a dedicated communication port on a specified format.

9 Installation

The **Installation** function opens a small sub-menu with access to the functions and dialogs required to set up the ES70 for operational use.

Tip

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Active menu

The following functions and parameters are available from the **Active** menu.

Click once on the icon under the **Main** menu to open the **Active** menu. Click one more time on the icon to close the menu.



1 Echogram

The **Echogram** dialog allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, and how fast the echogram moves across the display.

2 TVG

The purpose of the **TVG** button is to allow you modify the reception parameters by changing the Time Varied Gain (TVG) curve for the received echoes.

3 Ping-Ping Filter

The **Ping-Ping Filter** removes unwanted noise and echoes from the echogram presentation.

4 Bottom Gain

The **Bottom Gain** setting controls the gain below the detected bottom depth.



5 Size Distribution

The **Size Distribution** dialog allows you to set up the parameters for the histogram presented in the Size Distribution information pane.

6 Bottom Detector

The purpose of the **Bottom Detector** dialog is to define the upper and lower depth limits most likely to be used during the ES70 operation. In this dialog, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

Tip

For detailed information about every function, button and dialog, refer to the *ES70 Reference manual* or to the context sensitive on-line help.

Echo sounder theory

When you use an echo sounder there are some basic knowledge that you may find it useful to possess.

Topics

- *Concepts* on page 115
 - *Observation range* on page 115
 - *Split-beam operation* on page 116
 - *Bottom echo* on page 117
 - *Wave propagation* on page 117
 - *Biomass* on page 119
 - *Dynamic range and display presentation* on page 119
 - *Bottom slopes* on page 120
- *Parameters* on page 123
 - *TVG gain* on page 123
 - *Output power* on page 125
 - *Pulse duration* on page 127
 - *Range selection* on page 129

Concepts

Observe the following descriptions of key concepts.

Topics

- *Observation range* on page 115
- *Split-beam operation* on page 116
- *Bottom echo* on page 117
- *Wave propagation* on page 117
- *Biomass* on page 119
- *Dynamic range and display presentation* on page 119
- *Bottom slopes* on page 120

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.

Typical observation ranges are shown in the table. Using the **Simrad ES38B** transducer (38 kHz, 7x7 degrees, 2000 W) you can observe a 60 centimeter cod down to 950 meters, and bottom detection works down to 2800 meters. However, with the **Simrad ES200-7C** transducer (200 kHz, 7x7 degrees, 1000 W) you can only observe that same cod down to 270 meters, and bottom detection becomes unreliable below 500 meters.

Table 1 Maximum detection depth, single beam transducers

Transducer	Frequency (kHz)	Pulse duration (ms)	Bandwidth (hz)	Tx power (W)	Range fish (m)	Range bottom (m)
12-16	12	16,4	193	2000	850	10000
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
120-25	120	1,02	3026	1000	390	800
50/200D	200	1,02	3088	1000	280	550

Table 2 Maximum detection depth, split beam transducers

Transducer	Frequency (kHz)	Pulse duration (ms)	Bandwidth (hz)	Tx power (W)	Range fish (m)	Range bottom (m)
ES18-11	18	8,21	382	2000	1100	7000
ES38B	38	4,09	766	2000	950	2800
ES70-11	70	2,05	1526	800	450	1100
ES120-7C	120	1,02	3026	1000	440	850
ES200-7C	200	1,02	3088	1000	270	550

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

Split-beam operation

The ES70 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.

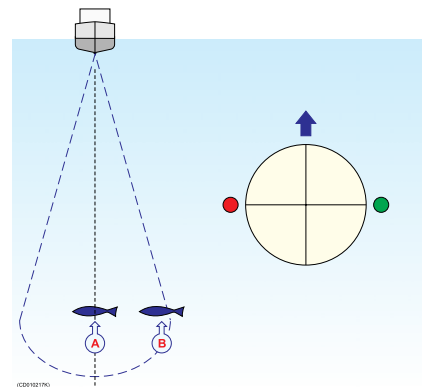
An acoustic wave front propagating towards the transducer arrives at the four quadrants at different times causing the phase angle of the electrical output signal from the quadrants to differ. The fore-and-aft angle is determined from the electrical phase difference between the fore and the aft transducer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

Figure 3 Split beam principles



Bottom echo

A hard flat bottom reflects the transmitted signal as if it was a mirror. The transmitted pulse hits the illuminated bottom area at nearly the same instant, and the echo from different parts of this area arrive back at the surface also at nearly the same instant.

The received echo signal is basically an attenuated copy of the short transmit pulse. The echo signal from a sloped bottom is characterized by having a longer duration and a slower rise and fall time. The transmitted pulse first hits the slope at point (A), and as time elapses the reflection point travels along the slope towards point (B). Many locations do not have a solid hard bottom. Frequently, the bottom is composed of layers of mud, clay and sand which can be observed as coloured bands 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 ES70 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.

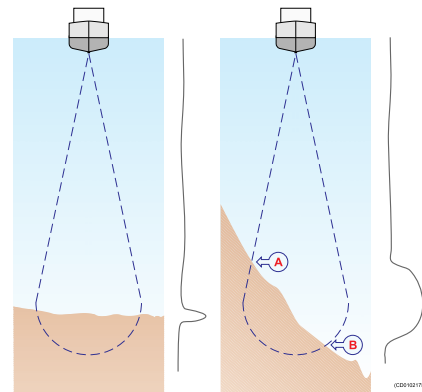
The bottom detection algorithm locks to the first good bottom return. The depth at point A rather than the depth along the transducer axis will be output for a sloped bottom. The detected depth value is always smaller than the depth along the transducer axis implying that a safety margin is automatically included.

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.

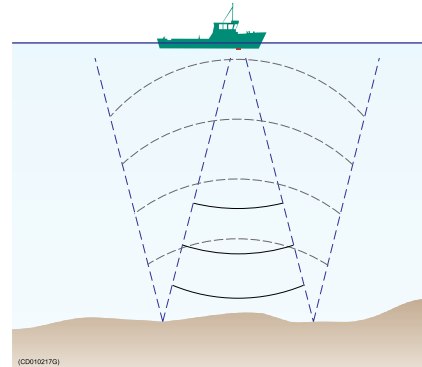
A good average value to be used in the **Environment** dialog is 1470 m/s.

Figure 4 Bottom echo principles



The ES70 transmits high energy sound wave pulses into the sea. A flat bottom reflects the transmitted wave as if it was a mirror. The propagating energy is spread over a larger and larger area as it travels down to the bottom and up again. The energy is spread over a four times larger area every time the travel distance doubles.

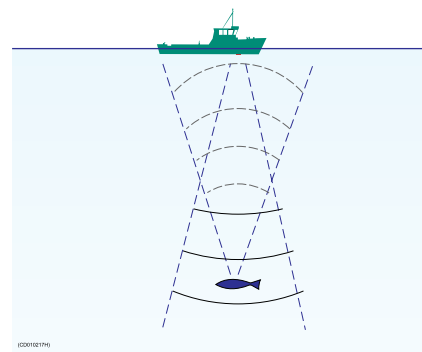
Figure 5 Wave propagation from a flat bottom



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.

Figure 6 Wave propagation from a fish



In the echo sounder's **Echogram** dialog *20 log TVG* spreading is referred to as *School Gain* and *Bottom Gain*, while *40 log TVG* spreading is referred to as *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.

Biomass

Provided that you use an ES70 with a split beam transducer, or have a valid biomass license on a single beam transceiver, you will have access to the **Biomass** information pane.

This biomass value is an indicator to how much fish you currently have in the current echogram, or in the zoomed area. Every single fish will emit an echo, and the sum of all these registered echoes are presented as a number. Smaller organisms such as plankton will also emit echoes, but these are so weak that they will hardly influence on the total biomass.



The ES70 records all the targets from the smallest plankton to the largest whale, and provides these findings as a number. For all practical purposes this number will provide you with information about the fish abundance to allow you to decide if it pays off to start fishing. You must also consider if this number is a result of large amounts of plankton or bait, or if there is real fish below the keel. The number provided to display fish abundance is relative, and after some use your experience will be a valuable factor when the decision is made.

The biomass value is also used by the researches to calculate how much fish there is in the ocean. If you know the fish specie and the size of the fish, you can calculate number of individual fishes for a given volume of sea. Other means to establish the final result are trawling and catch data from the fishery community.

Note

If you have other echo sounders or sonars running asynchronous with the ES70, the ES70 will also measure the transmit pulse from the secondary system. This is called interference.

*You can remove the interference using the **Ping-Ping Filter** function on the **Active** menu, but the ES70 receiver will still pick up the transmit pulse and implement it in the calculations.*

A full synchronization of the various acoustic instruments is required. If your own vessel produces excessive noise this will also be taken into the biomass calculations and provide you with inaccurate information.

Related topics

- *Biomass line* on page 93
- *Biomass information pane* on page 97

Dynamic range and display presentation

The ES70 echo sounder has a dynamic range of 140 dB. This means that the sounder can receive both very strong and very weak echoes. Actually, the ES70 will detect echoes from plankton to whales, bottom on most depths, and present the information free from distortion. As a comparison, our old echo sounders ES380 and ET100 had - using analogue TVG - a dynamic range corresponding to approximately 65 dB.

Naturally, we can not present all these echoes on the display simultaneously, as this would create a mess of colours.

When 12 colours are used, we create a 36 dB section and give each colour a 3 dB strength. Every colour (3 dB) the represent a doubling of the echo strength. With 12 colours in use this will be a 36 dB colour range from grey to brown. Grey is used for the weakest echoes, while the strongest echoes are brown. All echoes stronger than brown will still be brown, while echoes weaker than grey will not be shown.

With 64 colours in use, each colour represents approximately 0.5 dB echo strength.

The old paper sounders had a dynamic range of 12 dB in their printouts using the “colours” from light grey to black. The dynamic range in the ES70 colour presentation is thus a lot larger; 24 dB or 250 times.

Along the dynamic range we take the 36 dB section and “moves it” up and down with the settings in the **Gain** button on the **Main** menu.

Use the **Colour Scale** information pane to monitor the colours in current use. To change the colour scale, use the **Colour Setup** function on the **Display** menu.

Related topics

- *Colour Scale information pane* on page 97

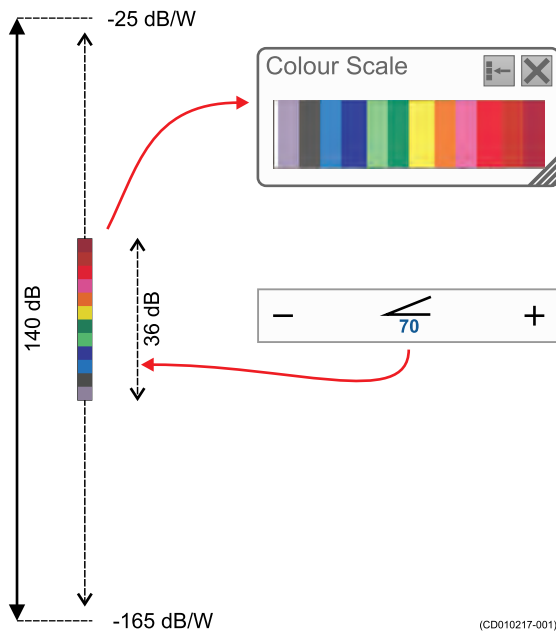
Bottom slopes

“Bottom slopes” is a well known phenomenon with echo sounders. This happens when the bottom rises suddenly, and the start edge of the transducer beam detects the bottom before the opposite edge.

One method for minimizing the “bottom slopes” phenomenon is to use a transducer with narrow beam, or to increase the pulse duration.

Another way to minimize this phenomenon is to open the **Bottom Detector** dialog, and then change the setting for **Bottom Backstep**. This function can also be put to other use.

Figure 7 Dynamic range in ES70



(CD010217-001)

- A *The peak of the bottom pulse*
- B *Default bottom backstep level*
- C *Approximate bottom backstep level for flatfish detection*
- D *Approximate bottom backstep level for seagrass detection*

The bottom pulse basically identifies the bottom depth just prior to the peak of the pulse (A). However, this may not be the true bottom. For example, if the bottom pulse is generated by a rock bottom under a thick layer of mud, the actual depth is slightly shallower. For this reason, the ES70 is by default set up to give you a depth reading a few milliseconds before the peak of the pulse. This is done by setting the bottom backstep level to a default value of -50 dB (B).

By further decreasing the level (make it more negative) the bottom detector will become more “sensitive”, and the bottom will be detected earlier.

On the echogram the white line will then “climb” up the slope. Make sure that you do not increase the sensitivity too much. This will have an effect on the fish detection on a flat bottom, and the biomass values will be wrong. Our experience show that an approximately -75 dB bottom backstep value can be used safely.

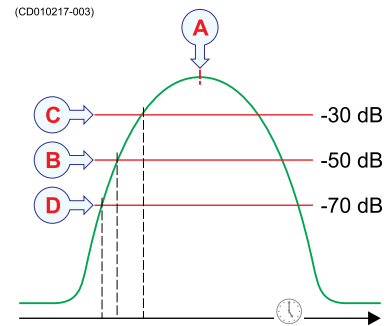
By increasing the bottom backstep value (make it more positive) the bottom will be detected later, and it will appear to be deeper.

Tip _____

Rule of thumb:

- Reduce the bottom backstep level (make it more negative) to detect the bottom earlier, and thus increase bottom detection “sensitivity”.
- Increase the bottom backstep level (make it more positive) to detect the bottom later, and thus increase “penetration”.

Figure 8 The Bottom Backstep principle



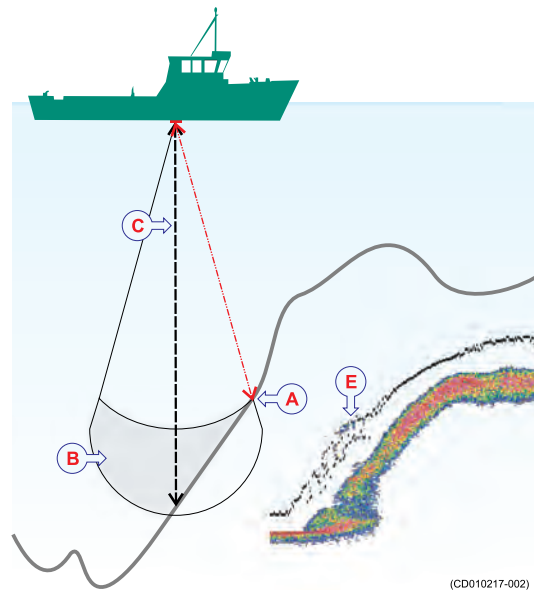
Example 15 Bottom slopes

The edge of the beam (A) hits the bottom first, and starts to give an echo. The bottom detector in the ES70 measures the strongest echo, detects what it thinks is the bottom, and starts the white line.

The area above the bottom detection (B) will be masked off, and even though it may contain fish these will not be visible because the echo from the bottom is stronger than those from the fish. The estimated depth (C) will be shown.

On the ES70 the phenomenon will cause the bottom line (E) to be distorted.

Figure 9 Bottom slopes



Example 16 Using the Bottom Backstep parameter for seagrass detection

If you use an Olex system, you can take advantage of the **Bottom Backstep** parameter to detect seagrass. Decrease the bottom backstep value (make it more negative) so that the bottom is detected at the top of an area of seagrass. The Olex will then detect the real bottom, and the result is the height of the seagrass.

→ *Adjusting the bottom detection to find seagrass on page 64*

Example 17 Using the Bottom Backstep parameter for flatfish detection

If you fish for sole, flounder or similar species, you can use the **Bottom Backstep** parameter to enhance the detection of the fish. Increase the bottom backstep value (make it more positive) so that the bottom is detected slightly deeper than the correct depth. The ES70 will then “push through” the fish better, and the flatfish will be shown as they are located “above” the bottom.

→ *Adjusting the bottom detection to find flatfish on page 63*

Parameters

Observe the following descriptions of key parameters.

Topics

- *TVG gain* on page 123
- *Output power* on page 125
- *Pulse duration* on page 127
- *Range selection* on page 129

TVG gain

TVG means *Time Varied Gain*. When TVG is used in an echo sounder, we also some times refer to it as *depth variable gain*.

The purpose of the TVG functionality is to make all fishes appear with the same echo colour independent of their different depths.

In more technical terms, time varied gain (TVG) is a signal compensation. When the acoustic signal is transmitted from the echo sounder transducer, it is subjected to loss due to *absorption* and *spreading*. First, depending on the current salinity and temperature, the water will absorb some of the energy from the transmission. The absorption loss increases as the range increases. Second, the energy will spread out to form a circular beam. The width of this beam also increases with the range. Both absorption and spreading will thus reduce the energy, and both will also have an effect on the returned echo signal. The TVG compensation is designed to counteract these natural phenomena, and this is done in the ES70 using digital signal processing. The desired result is that fish of the same size return echoes of the same strength (colour), regardless of range.

The following TVG settings are available:

a Power (No TVG)

TVG gain is not implemented. This setting is hardly ever used.

b School (20 log TVG)

This gain setting offers weaker amplification close to the bottom. It has been designed to provide the best echoes for schools. The physical size of a school allows you to detect it even with reduced gain.

c Fish (40 log TVG)

This gain setting provides larger amplification close to the bottom. It has been designed to provide the best echoes from single fish.



d Targets (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional filtering and compensation is implemented. Only echoes detected and interpreted as single fish are shown. The echoes are compensated for their physical position in the beam (beam compensation). This means that fish in the outer region of the beam are adjusted to correct size even though their echoes are weaker.

Note that this **Targets (40 log TVG)** setting is only functional with split beam transducers.

e Target Mix (40 log TVG)

Basically, this setting uses the same TVG amplification as **Fish**, but additional beam compensation is implemented. Echoes detected and interpreted as single fish are adjusted to their correct size according to their physical position in the beam.

Note that this **Target Mix (40 log TVG)** setting is only functional with split beam transducers.

f User (Variable TVG)

This setting allows you to define your own TVG setting.

You can adjust the TVG setting using the **Echogram** or **TVG** functions. Both are located on the **Active** menu.

Because the strength of the echoes will become weaker with increasing depth, the echo sounder will automatically amplify the deepest echoes more than the shallower echoes. In fact, the gain will increase proportional to how long the echo sounder “waits” for the echoes. When you choose the TVG setting you can either switch it off (which we do NOT recommend), or you can choose settings **20 log R** or **40 log R**.

The various settings control the gain algorithms, how much gain to be applied when the depth increases. When you choose the **40 log R** setting, the gain will increase with the depth more rapidly than if you choose the **20 log R** setting. This is simply because individual fish emit smaller echoes than a school, and this makes them more difficult to detect. In the equation the character **R** means “Range”.

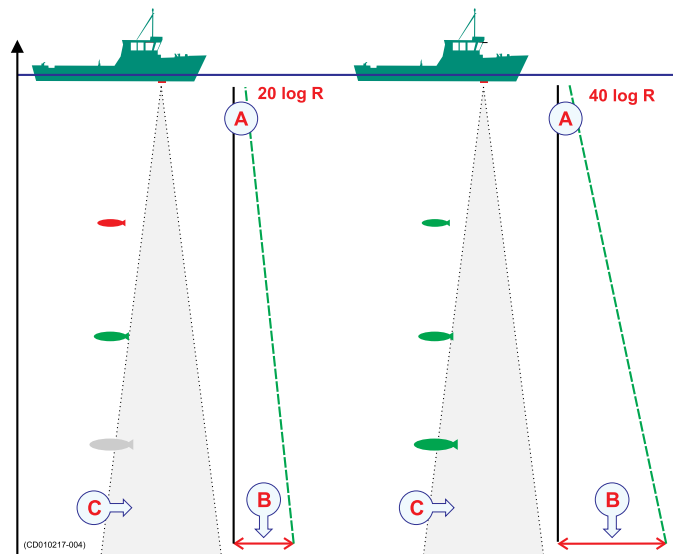
The illustration shows how the gain close to the bottom (B) is larger than just below the transducer (A). The echoes from the fish close to the bottom will then be shown with the same strength (colour) as echoes from pelagic fish.

The left vessel uses the **20 log R** setting. Due to the increasing beam width (C), single fishes are shown larger and larger with increasing depth, even though they may be of identical size.

The right vessel uses the **40 log R** setting. The size of the fish will still appear to grow larger as the range increases, but the echo is compensated differently to offer a more uniform echo strength (colour in the echogram).

When you are looking for schools these will fill the entire beam, just as the bottom normally does. A lot of gain is then not necessary. The **20 log R** setting will provide an acceptable echo strength.

Figure 10 TVG principle



Output power

The echo sounder's transducer converts the electrical input power to a sound transmitted into the water. In the majority of the transducers manufactured by Simrad the transducer's *power efficiency* is between 50 and 75%. This means that between 50 and 75% of the input power is transmitted as sound. Transducers from other manufacturers may have as low as 5% power efficiency. Naturally, it is very important that you check this parameter when you wish to purchase a transducer.

The echo sounder's *output power* is a measurement on how much electrical energy the amplifier can send down to the transducer. The maximum power is limited by the transducer you have, and how much power it may accept from the transmitter for conversion to acoustic energy. If you send too much power into the transducer, you may inflict permanent and unreparable damage.

The *source level (SL)* is a measurement on how much acoustic energy that is in fact sent out by the transducer, how high "volume" it will emit. The source level is measured as "sound pressure" one meter below the transducer face, and it is given in dB re. $1\mu Pa$ at $1 m$.

In order to know how much power you can use you must know what kind of transducer you are using. Provided that the echo sounder has been installed with a Simrad transducer, and you know what type it is, this is no problem. All necessary parameters about the transducer are then known by the echo sounder, and the software in the sounder

will ensure that you do not output too much power. If you use a third party transducer you must manually check that the output power from the Simrad ES70 does not exceed the power rating.

Note

If you send too much power into the transducer it will – just like a loudspeaker – be damaged beyond repair.

If the transducer receives too much power from the echo sounder, it will also *cavitate*. This is a physical phenomenon causing the appearance of gas bubbles immediately below the transducer face. When this happens hardly any energy is sent into the water, and the transducer face is subject to physical damage. The cavitation depends on the power applied, the physical size of the transducer face, how deep the transducer is mounted, and the amount of contamination (air and particles) under the transducer face. Transducers with a large face can accept more power.

Near sea level, minute bubbles of micron or submicron size are always present in the ocean. When the rarefaction tension phase of an acoustic wave is great enough, the medium ruptures or "cavitates". For sound sources near the sea surface, the ever-present cavitation nuclei permit rupture to occur at pressure swings of the order of 1 atm (0.1 MPa), depending on the frequency, duration, and repetition rate of the sound pulse. Cavitation bubbles may also be produced by Bernoulli pressure drops associated with the tips of high-speed underwater propellers. Natural cavitation is created by photosynthesis.

Several extraordinary physical phenomena are associated with acoustic cavitation. Chemical reactions can be initiated or increased in activity; living cells and macromolecules can be ruptured; violently oscillating bubbles close to a solid surface can erode the toughest of metals or plastics; light may be produced by cavitation (sonoluminescence). The high pressures and high temperatures (calculated to be 30,000° Kelvin) at the interior during the collapsing phase of cavitating single bubbles can cause emission of a reproducible pulse of light of duration less than 50 picoseconds.

Of direct importance to the use of sound sources at sea is the fact that, as the sound pressure amplitude increases, ambient bubbles begin to oscillate nonlinearly, and harmonics are generated. At sea level, the amplitude of the second harmonic is less than 1 percent of the fundamental as long as the pressure amplitude of the fundamental of a CW wave is less than about 0.01 atm rms (1 kPa) (Rusby 1970). This increases to about 5 percent harmonic distortion when the signal is about 10 kPa.

When the peak pressure amplitude is somewhat greater than 1 atm, the absolute pressure for a sound source at sea level will be less than zero during the rarefaction part of the cycle. In using CW below 10 kHz, this negative pressure, or tension, is the trigger for a sharply increased level of harmonic distortion and the issuance of broadband noise. Any attempt to increase the sound pressure amplitude appreciably

beyond the ambient pressure will cause not only total distortion but also the generation of a large cloud of bubbles which will actually decrease the far-field acoustic pressure.

The detailed bubble activities during cavitation have been studied in several laboratories. Acousticians have identified gaseous cavitation resulting in streamers of hissing bubbles that jet away from regions of high acoustic pressure swings, and vaporous cavitation, which radiates shock waves of broadband noise.

— *Herman Medwin & Clarence S. Clay (1998)*^[1]

In order to control the power output on the Simrad ES70, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *Choosing passive mode of operation* on page 71
- *Changing the output power* on page 71
- *Adjusting the pulse duration (length)* on page 72

Pulse duration

The echo sounder's *pulse duration* is a measurement for how long the acoustic pulse lasts.

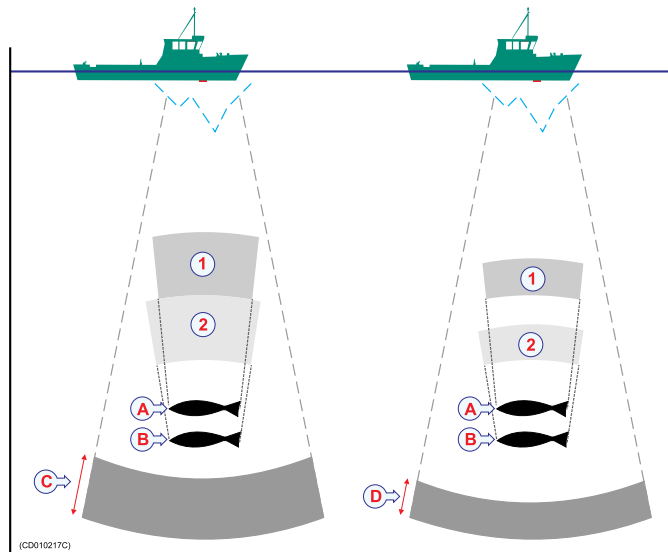
The pulse duration can be adjusted according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be used. Remember that in ES70 echo sounder, the pulse duration and the bandwidth is mutually dependant.

- Long pulse - lots of acoustic energy - narrow bandwidth - less sensitive for noise from own vessel and environment
- Short pulse - less acoustic energy - wide bandwidth - more sensitive for noise from own vessel and environment

1. from “Fundamentals of Acoustical Oceanography”, Academic Press, San Diego, 1998

A pulse duration of 1 mS covers 1,5 meters in the water, and this corresponds to a target separation of approximately 75 cm. This is a typical pulse duration that you may well use down to 250 to 300 meters. If you work in deeper waters use a longer pulse duration, if it is shallower, use a shorter pulse duration. Try out different values, and seek out the pulse duration that provides you with the clearest echo presentation with minimum noise, but with maximum fish detection and separation.

Figure 11 Pulse duration principles



The left vessel uses a long pulse duration (C). As you can see, this causes the echoes from the two fishes (A) and (B) to merge. The right vessel uses a shorter pulse duration, and the two fishes will then appear as two separate echoes on the echogram. Thus, short pulses will provide the best resolution and separation of individual fishes, but the echo sounder is more sensitive to noise.

The speed of sound in water is approximately 1500 m/s. The length of a 1 mS sound pulse will thus be approximately 1,5 meter. With the echo sounder you can then adjust the sound pulse from 7,5 cm (0.05 mS) to 24 m (16 mS) depending of the operational frequency. This is an important factor for the appearance of single fishes.

- When the vertical distance between to fishes, or the distance between a fish and the bottom, is more than the distance covered by a half pulse duration, the echoes will be presented as two separate echoes. The fish above the bottom will be identified.
- If the distance between two individual fishes, or the distance between a single fish and the bottom, is less than the distance covered by a half pulse duration, the echo will be presented as one echo. The echo from the fish close to the bottom will be merged with the bottom echo.

All operational frequencies have different pulse durations. The difference between for example a 50 kHz and a 38 kHz transducer is however not large:

- A 50 kHz transducer can be used with pulse durations from 0,12 mS to 2 mS
- A 38 kHz transducer can be used with pulse durations from 0,26 mS to 4 mS.

Basically, both these frequencies will provide you with the same detection ability. A 50 kHz transducer may provide better resolution in shallow waters, while the 38 kHz transducer may provide longer range on deeper waters. On the 38 kHz transducer the shortest pulse duration is 0,26 mS. This results in a 40 cm sound pulse and a 20 cm fish separation.

In order to control the pulse duration on the Simrad ES70, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *Adjusting the pulse duration (length)* on page 72

Range selection

For every frequency (channel) you wish to present on the echo sounder display, you are provided with two echograms.

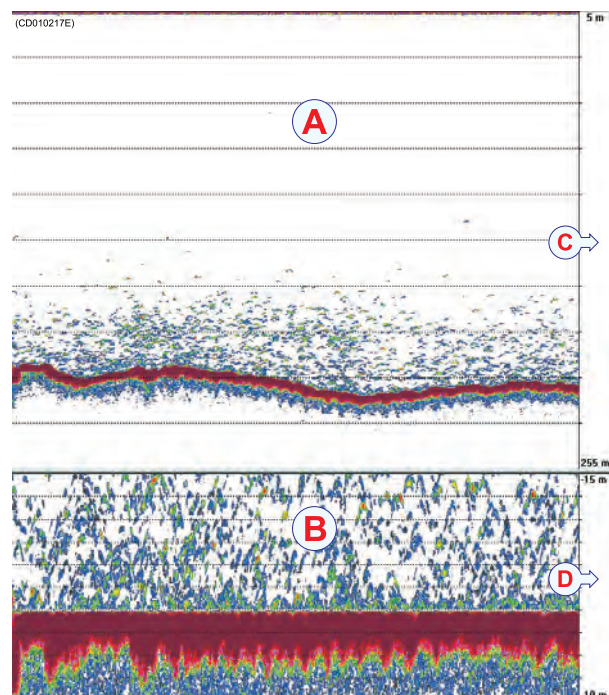
- A *Upper echogram (surface related)*
- B *Lower echogram (bottom related)*
- C *Scope view for upper echogram*
- D *Scope view for lower echogram*

Normally, the upper echogram will show the entire depth range from the sea surface and down to the bottom, while the lower echogram shows a bottom expansion. This is a magnification of the area just above and below the bottom.

You are free to choose any presentation you want in any of the echograms.

To do this, open the **Echogram** dialog on the **Active** menu.

Figure 12 Range selection



Upper echogram: Pelagic or surface related

When you need to establish a vertical depth range, why not let the echo sounder choose it for you. On the main menu, set **Range** to *Auto*.

You can also define your own depth range. To establish a depth range from the surface and down to the bottom, set **Range** to a suitable depth, and **Start Range** to 0 (zero) meters.

A *phased area* may also be established. This is used when you wish to concentrate on a certain and limited depth range. If you for example finds a school of fish 150 meters below the surface, you can set up the echo sounder to show this school without also provided information from the water column over and under it. To set this up, set **Start Range** to a few meters above the school, and **Range** to a few meters below it.

If you are bothered by interference from a sonar using the same operational frequency, try to set **Start Range** to 10 to 20 meters. You will then avoid the noise when both systems transmit simultaneously.

Example 18 Start Range in a surface related echogram

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

Example 19 Start Range in a surface echogram

In a surface echogram, set the **Start Range** value to 10 meters. This will make the echogram start from 10 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to the current depth plus 20 meters. The echogram will now show the area from 10 meters below the sea surface, and down to 10 meters “below” the bottom. The bottom contour is easily detected when the depth changes.

Example 20 Start Range in a pelagic echogram

In a pelagic echogram, set the **Start Range** value to 20 meters. This will make the echogram start from 20 meters below the sea surface (provided that the transducer offset has been defined). Set **Range** to 40 meters. The echogram will now show the area from 20 meters below the sea surface, and down to 60 meters below the transducer. Provided that the depth is larger than 60 meters, the bottom contour is not shown.

Lower echogram: Bottom related (bottom expansion)

The majority of our users prefer to use the lower echogram (B) for bottom expansion. This is the default setting.

When you use bottom expansion, the water surface is not the reference any longer, but the bottom is. It is always 0. That means that the bottom in this echogram will always be flat, even though it may vary in the upper echogram. To choose a vertical depth range for the bottom expansion, set **Range** to a positive value. This is the total vertical range of the echogram. Then, set **Start Range** to a negative value. This is the echogram's start height above the bottom. In this echogram positive depth is below the bottom, while negative depth is above.

Typical settings may be:

- Range = 15 m
- Start range = -10 m

This provides you with a 15 meters high phased area starting at 10 meters above the bottom to 5 meters below it.

Example 21 Start Range and Range in bottom related echogram

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

Installation

These are the specific procedures required to get you started with the Simrad ES70. Normally, you will only need to do these procedures once.

We recommend that you allow your dealer – with the assistance from a shipyard – to do the physical installation, install the software, obtain a valid license, and get you started.

Topics

- *Installation of the system units* on page 132
- *Installation of the ES70 software* on page 133
- *Obtaining the software license* on page 134
- *Setting up the ES70 transceiver(s) for the first time* on page 135
 - *Main procedure* on page 135
 - *Installing frequency channels* on page 136
 - *Starting normal operation* on page 137

Installation of the system units

This procedure explains the basic principles of ES70 installation. It does not provide any details related to physical installation of the various units, location and installation of the transducer(s), and the various interface parameters.

All documentation for the Simrad ES70 is located on the media device provided with the delivery. The documents can also be downloaded from <http://www.simrad.com>.

Note

In order to install the Simrad ES70 you must obtain and read the Simrad ES70 Installation manual.

Procedure

- 1 Install the various hardware units (transceiver(s), computer(s) and transducer(s) as described in the *Simrad ES70 Installation manual*.
- 2 Connect all necessary cables between the hardware units.
 - a Connect the transducer(s) to the transceiver(s).

- b** Connect power to the transceiver(s).
- c** Connect the Ethernet cable between the transceiver and the computer. Use an Ethernet switch if you have more than one transceiver.
- d** Connect the necessary cables to the display; power and video.

These tasks are described in detail in the *Simrad ES70 Installation manual*.

- 3** Do a close visual inspection of the installation. Check each cable and connection to ensure that all wiring is correct.
- 4** Power up the ES70, and proceed with the next procedure; software installation.

Related topics

- *Installation of the ES70 software* on page 133

Installation of the ES70 software

Use this procedure when you wish to install the ES70 software on a computer.

Note

Note that minimum hardware and software requirements must be met by the computer.

Procedure

- 1** Power up the computer.
- 2** Insert the ES70 software media.
If the ES70 software is provided on a CD or DVD, and your computer is not fitted with a suitable drive, copy the files from the CD/DVD to a USB memory stick.
- 3** Use a file manager application on the computer to access the software.
- 4** Double-click on the **Setup.exe** file to start the installation.
- 5** Allow the installation program to run. Follow the instructions provided.

Note

In the last dialog you are permitted to remove old settings. If you click to do this, the installation wizard will delete all settings related to the physical installation. These include all interface parameters, and all transceiver settings. Only software licenses are kept.

- 6** Once the installation has been completed, double-click the program icon on the desktop to start the application.
- 7** If you use **Windows 7** operating system:
 - a** Observe that **Windows 7 Firewall** will open a dialog requesting information about the network.
Select *Public*, and click **Allow access**.
 - b** The operating system may also open other dialogs to verify that the ES70 software can run on the computer. You must permit this.

8 Observe the relevant start-up procedure.

Related topics

- *Setting up the ES70 transceiver(s) for the first time* on page 135
- *Powering up the ES70* on page 15

Obtaining the software license

The ES70 requires a valid license to operate. This procedure explains how to obtain a license, and how to install it on your ES70 computer.

Without a license you will not be able to communicate with the ES70 Transceiver Unit(s).

Note

If you replace your computer, or if you replace major components inside your computer, you will need a new license code.

We strongly advice you to record the license code for safe keeping. You may for example write it down in the beginning of this manual.

- 1 Double-click the ES70 icon on the desktop to start the application.
- 2 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.
- 3 Click the **Setup** icon.

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

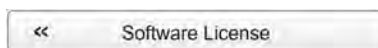
→ *Setup menu* on page 111



- 4 Click **Installation** to open the **Installation** sub-menu.



On the sub-menu, click **Software License** to open the **Software License** dialog.



The purpose of the **Software License** dialog is to allow you to enter a license code (text string) to unlock the ES70 functionality. In order to obtain the license code(s) required, contact your dealer.

- 5 Write down the **Hardware ID** provided by the **Software License** dialog.

- 6 Contact your dealer to order the software license.
Your dealer will need the following information from you to place the order:
 - Vessel name and call sign
 - Vessel type (trawler, purse seiner, etc.)
 - Vessel owner's name, address and contact information
 - Serial number on all transceivers
 - Hardware ID
- 7 When the software license is returned to you, start the ES70, open the **Software License** dialog, and click **Enter Licence String**.
- 8 Write down the code, and click **Ok**.
- 9 Click **OK** to save the current settings and close the dialog.

Setting up the ES70 transceiver(s) for the first time

These procedures explain how to set up your computer to communicate with the transceiver. You only need to do this once.

Topics

- *Main procedure* on page 135
- *Installing frequency channels* on page 136
- *Starting normal operation* on page 137

Main procedure

This procedure explains how to set up your computer to communicate with the transceiver. You only need to do this once.

Note that this procedure covers both the Windows® XP® and Windows® 7 operating systems.

Important

Your computer may be provided with two Ethernet boards to interface with a local area network (LAN). You must then use one Ethernet board to communicate with the ES70 transceiver(s), and one to communicate with the LAN. These two boards can and must be set up separately. The Ethernet board used to communicate with the transceivers(s) must be set up with manual IP addresses. The board used to communicate with the LAN must be set up to obtain an IP address automatically (unless otherwise decided by your network administrator.)

Procedure

- 1 On the computer, define the network adapter settings.

Windows® XP®

- a Click **Start** → **Settings** → **Network Connections**.
- b Click on the network adapter once to select it.
- c Right-click, and click **Properties** on the short-cut menu.
- d On the list of connections, click **Internet Protocol (TCP/IP)**, and then **Properties**.
- e Click **Use the following IP address**, and enter the IP address and network mask.
IP Address: 157.237.14.12
Subnet mask: 255.255.0.0
- f Click **OK** to save the settings.
- g Exit all dialogs.

Windows® 7

- a Click **Start** → **Control Panel** → **Network Connections**.
 - b Click **Change adapter settings** on the left menu.
 - c Click once on the network adapter to select it, and click **Properties** on the short-cut menu.
 - d On the list of connections, click **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.
 - e Click **Use the following IP address**, and enter the IP address and network mask.
IP Address: 157.237.14.12
Subnet mask: 255.255.0.0
 - f Click **OK** to save the settings.
 - g Exit all dialogs.
- 2 On the computer, start the ES70 program.
 - 3 Set up the transceiver(s) and transducer(s).
 - 4 Start normal operation.

Related topics

- *Installing frequency channels* on page 136
- *Starting normal operation* on page 137

Installing frequency channels

This procedure explains how to install a frequency channel.

Important

You must have a valid software license on your ES70 computer to set up a frequency channel!

Each transceiver contains one or more frequency channels.

This phrase is used to identify the combination of a transceiver, transducers and the frequencies offered. Split beam transceivers contain only one channel each.

The upper part of the **Transceiver Installation** dialog displays a list of frequency channels which either are, or have been, installed on the ES70. For each channel on the list, a **Status** label is provided.

The following status values are available in the **Transceiver Installation** dialog.

- **Busy:** The frequency channel is already in use, probably by another echo sounder on the same network. You can not connect to this channel.
- **Installed:** This frequency channel is connected to your ES70 system.
- **Lost:** This frequency channel can not be used.
- **Available:** This frequency channel is vacant and ready for use.

Procedure

- 1 Click the **Setup** icon.

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

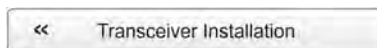
→ *Setup menu* on page 111



- 2 Click the **Installation** button to open the **Installation** menu.



On the menu, click **Transceiver Installation** to open the **Transceiver Installation** dialog.



The purpose of the **Transceiver Installation** dialog is to set up the necessary parameters to connect the ES70 computer to the transceiver(s) and the transducer(s).

- 3 In the **Transceiver Installation** dialog, click **Browse**.

The ES70 will automatically search the network for transceivers.

- 4 Observe that all the frequency channels are listed in the dialog.
- 5 Select a frequency channel that is available, and choose the correct transducer in the spin box.

Note

This is a critical task. You must ensure that the correct transducer is selected. If you connect the transceiver to a transducer that can not handle the power rating, it may be damaged beyond repair.

- 6 Observe that the status for the relevant frequency channels changes to *Installed*.
- 7 Click **OK** to save the current settings and close the dialog.

Starting normal operation

This procedure explains how to set up the ES70 for normal operation.

1 Observe the **Main** menu. It is normally located on the right hand side of the ES70 presentation.

2 Click the **Operation** icon.

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



→ *Operation menu* on page 109

3 Click the **Operation** button, and select *Normal*.

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