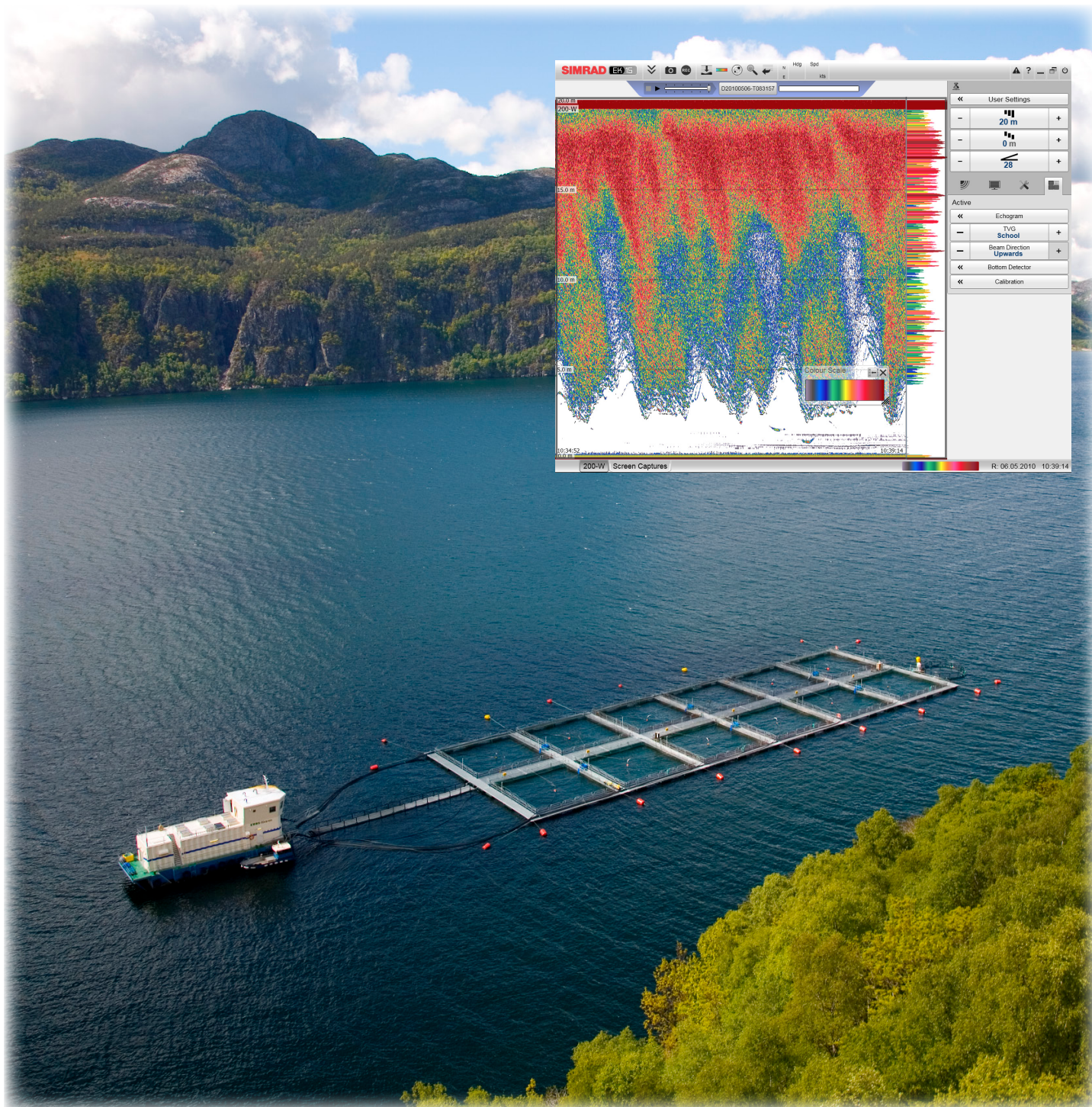


Operator manual

Simrad EK15

Multi purpose scientific echo sounder





KONGSBERG

Simrad EK15

Operator manual

Release 1.2.4

This manual provides you with the basic information required to operate the Simrad EK15 Multi purpose scientific echo sounder. For a more detailed description of the operation and functionality, including menus and all parameters, refer to the *Simrad EK15 Reference manual*.

All user documentation is included on the software media provided with the Simrad EK15. The manuals can also be downloaded from <http://www.simrad.com/ek15>.

The Simrad EK15 transducer (200–28CM) is not designed for hull mounting!

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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 EK15.

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 EK15 Reference manual*.

Target audience

The manual is intended for all basic users of the Simrad EK15.

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 EK15 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 EK15 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 dialog boxes.

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 EK15 can be downloaded from <http://www.simrad.com/ek15>.

License information

The Simrad EK15 is a licensed product. In order to obtain a license, contact your local dealer.

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Simrad EK15

Study this chapter to familiarize yourself with the Simrad EK15.

Topics

- *Important* on page 10
- *System description* on page 11
- *System diagram* on page 13
- *Support information* on page 14

Important

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

Topics

- *When the EK15 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 EK15* on page 11
- *Transducer handling* on page 11

When the EK15 is not used

When you do not use the EK15, switch off the display and the computer.

If you know that you will not use the EK15 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.

Related topics

- *Powering down the EK15* on page 17

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 EK15 when the vessel is in dry dock.

To ensure that this can not happen, disconnect the power supply cable to the either the computer or the transceiver - or both! You may also remove the circuit breakers on the AC mains supply to the EK15 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.

Related topics

- *Support information* on page 14

When you switch off the EK15

You must NEVER switch off the EK15 by means of the on/off switch on the computer.

You must ALWAYS exit the EK15 application by clicking the **Exit** icon on the **Title Bar**.



If you power down the EK15 by means of the computer switch you may damage the software application and the interface parameters to external devices.

Important _____

Observe the procedure!

Related topics

- *Powering down the EK15* on page 17

Transducer handling

The Simrad EK15 transducer (200–28CM) is not designed for hull mounting!

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 EK15 is designed for a variety of applications, and for both mobile surveys and fixed locations.

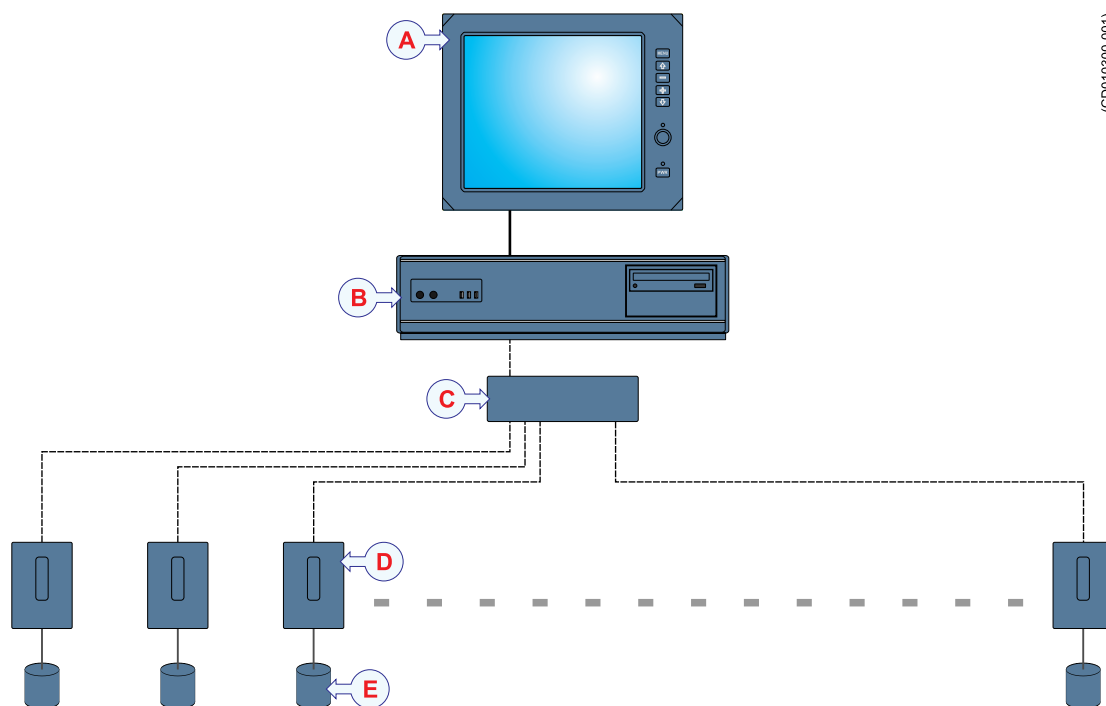
You can put it to use in a wide variety of environments: lakes, fjords, harbours, shallow marine, rivers, and even in aquaculture fish cages. The unique functionality offered using numerous transceivers, raw data logging and interfaces to secondary systems allow you to use the EK15 for fish stock assessment, studies of fish behavior and fish-plankton interactions, habitat mapping and ecosystem monitoring.

The Simrad EK15 is based on a small and ruggedized single beam Transceiver Unit and a dedicated transducer. The operational frequency is 200 kHz, which offers a very high resolution and high accuracy. You can use the Simrad EK15 with up to 15 Transceiver Units. These will operate in parallel with either simultaneous or sequential pinging. Using multiple transceivers you can monitor large areas with only a single echo sounder system.

System diagram

A typical EK15 system diagram with four transceivers is provided. Interface capabilities, power supplies and power cables are not shown.

Typical system diagram with a number of transceivers



- A Colour monitor
- B Processor Unit (personal computer)
- C Ethernet switch
- D Transceiver Unit
- E Transducer

To control the EK15 operation you can use a standard commercial computer, even a laptop. The EK15 application supports Windows® 7 operating system. On a larger system with multiple transceivers we recommend using a large display in order to view all echograms simultaneously.

You can connect up to 15 transceivers to the computer by means of a commercial Ethernet switch. If you only need one transceiver, the switch is not required. Each transceiver is provided with a dedicated power supply for AC operation. The only communication between the transceivers and the Ethernet switch (or computer) is the Ethernet cable. Due to the amount of information, only high quality Ethernet cables can be used. The cables may be easily replaced by commercial wireless systems.

Support information

If you need technical support for your Simrad EK15 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>.

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- **Telefax:** +60 3 2201 3359
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- **Website:** <http://www.simrad.com>

Getting started

This chapter describes how to get started with the basic operation of the EK15.

It contains a 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 EK15 so that you can familiarize yourself with the menus, dialog boxes and display presentations.

Are you going to power up the Simrad EK15 for the first time?

If you are about to switch on your Simrad EK15 system for the very first time, see first *Installation* on page 125. It provides relevant hardware and software procedures for initial start-up and configuration.

Have you installed at least one frequency channel?

This chapter assumes that the Simrad EK15 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 128.

Topics

- *Power on/off procedures* on page 16
- *Starting normal operation* on page 18
- *Operating principles* on page 28
- *Presentation overview* on page 29
- *Context sensitive on-line help* on page 36

Related topics

- *Operational procedures* on page 37

Power on/off procedures

These procedures explain how to switch the EK15 system on and off.

Note

When you power up the EK15 for the very first time, observe the procedures in chapter Installation on page 125.

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 press 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 EK15* on page 16
- *Powering down the EK15* on page 17

Powering up the EK15

Purpose

This procedure explains how to power up the Simrad EK15 system.

This procedure assumes that you have connected one or more transceiver to the EK15. If this is not the case, observe the relevant start-up procedure in chapter *Installation*.

Related topics

- *Setting operational mode 'Normal' to start 'pinging'* on page 19
- *Starting normal operation* on page 18
- *Checking the bottom detector settings* on page 21
- *Setting up the EK15 transceiver(s) for the first time* on page 127
- *Operation menu* on page 105

Procedure

- 1 Verify that the transceiver(s) are switched on.

The Single Beam Transceiver (SBT) 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 EK15 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 Processor Unit (computer).

Wait for the operating system to start up.

- 4 Double-click the EK15 icon on the desktop to start the program.

- 5 Wait while the program starts on the computer.

- 6 Choose user settings.

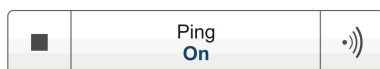
During the program load, a dialog box appears to let you choose from the current user settings available on the EK15.

The dialog box 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 box on the **Main** menu.

- 7 Observe that the program presentation fills the entire screen.

Important

When the EK15 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.

→ *Setting operational mode 'Normal' to start 'pinging' on page 19*

- 9 Observe that the EK15 starts.

The EK15 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 EK15 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 EK15 to display the wrong depth. In these cases the sounder may display the bottom at 0,0 meters. In order to aid the EK15 to locate the correct depth, observe the dedicated procedure.

Powering down the EK15

Purpose

This procedure explains how to power off the Simrad EK15.

Note

You must never switch off the EK15 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 in the program.
It is located on the **Title Bar** in the top right corner of the display presentation.
- 2 Observe that the program 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 Single Beam Transceiver (SBT) 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 EK15 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 EK15 system, you are ready to start the actual operation.

When started up, the EK15 will automatically apply its previous setup parameters.

The procedures assume that the EK15 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 128

These procedures are partly provided to get you acquainted with the basic functionality provided by the EK15, partly to set up the system for normal use, and partly to start normal operation.

Topics

- *Setting operational mode 'Normal' to start 'pinging'* on page 19
- *Selecting menu language* on page 19
- *Checking the transceiver and transducer settings* on page 20
- *Checking the bottom detector settings* on page 21
- *Checking the colour scale settings* on page 22
- *Changing the colour scale to remove the weakest echoes* on page 23
- *Checking the echogram settings* on page 24
- *Checking the range settings* on page 26
- *Saving the current user settings* on page 27

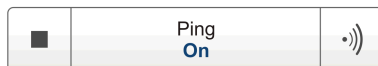
Setting operational mode 'Normal' to start 'pinging'

Purpose

This procedure explains how to set up the EK15 for normal operation and start 'pinging'.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 Click the **Operation** icon.
This icon is located under the **Main** menu. It is used to open the **Operation** menu.
- 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

Purpose

The menu buttons – as well as other texts – in the EK15 presentation are available in several languages. This procedure explains how to select a different language.

Related topics

- *Display menu* on page 106

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 Click the **Display** button to open the menu.
This button is located under the **Main** menu. It is used to open the **Display** submenu.
- 3 Click the middle of the **Language** button to open a submenu with the 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 submenu closes, 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 EK15 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 EK15. If your language is *not* offered, the English on-line help will appear.

Checking the transceiver and transducer settings

Purpose

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

Related topics

- *Setup menu* on page 107
- *Installing frequency channels* on page 128
- *Pulse duration* on page 122

Procedure

- 1 Observe that the currently connected transducer(s) are shown as tabs on the **Status bar**.
- 2 Click the **Setup** icon.
This icon is located under the **Main** menu. It is used to open the **Setup** menu.
- 3 Click the **Installation** button to open the **Installation** menu.



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



The purpose of the **Transceiver Installation** dialog box is to set up the necessary parameters to connect the EK15 computer to the transceiver(s) and the transducer(s).

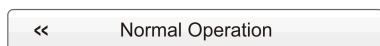
- 4 Check that all applicable transceivers and transducers are connected and operational.
For each transceiver, this is indicated by the green label with text “Installed”.
If a problem exists, refer to the relevant procedure in the *Operational procedures* chapter.
- 5 Click **OK** to save the current settings and close the dialog box.

- 6 Click the **Operation** icon.

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



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



The purpose of the **Normal Operation** dialog box 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 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 box.

Checking the bottom detector settings

Purpose

This procedure explains how to set up the bottom detector parameters (minimum and maximum depth) using the **Bottom Detector** dialog box. Use these parameters if the EK15 has problems detecting the bottom.

Related topics

- *Active menu* on page 108

Procedure

- 1 Click the **Active** icon.

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



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



The purpose of the **Bottom Detector** dialog box is to define the upper and lower depth limits most likely to be used during the EK15 operation. In this dialog box, 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 EK15 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 box.

Checking the colour scale settings

Purpose

This procedure explains how you can change the colour scale currently used for the EK15 presentation.

Description

Which colour scale to use is mainly a personal preference based on ambient light conditions, the nature of the echoes and your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

However, as the number of colours can differ, and dedicated colour schemes can be used, this is not necessarily correct. A high numeric TVG value displays weak echo signals properly while the stronger signals saturate into the darker colours. A low numeric value displays strong echo signals properly. Weak signals below the lower limit of the colour scale are not displayed (the display background colour is used).

If you choose to use many colours, the resolution of the EK15 presentation is greatly improved. It is then easier to distinguish the difference between the various echoes of different size and/or target strength.

Related topics

- *Changing the colour scale to remove the weakest echoes* on page 23
- *Colour Scale information pane* on page 95
- *Display menu* on page 106

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.



- 2 Observe that the current colour scale is shown.

To change the number of colours in the colour scale, see the dedicated procedure.

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

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



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



The purpose of the **Colour Setup** dialog box is to control the presentation colours used by the EK15.

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

Changing the colour scale to remove the weakest echoes

Purpose

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

Description

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 box on the **Display** menu.

Related topics

- *Colour Scale information pane* on page 95

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.



- 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.

Checking the echogram settings

Purpose

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.

Related topics

- *Display organization* on page 74
- *Status Bar* on page 97
- *TVG gain* on page 118

Procedure

- 1 Observe the EK15 echogram.

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

- 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 box; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **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.

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.

- 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 box.

- 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 box will by default only apply to this echogram.

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



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

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

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

The **Lines** tab in the **Echogram** dialog box 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 box 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.

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

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

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

- 13 Try the various options to see the variations on the echogram.
- 14 Click **OK** to save the current settings and close the dialog box.

Checking the range settings

Purpose

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.

Example 1 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 2 Start Range in a surface related echogram

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

- 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 3 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

Purpose

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 EK15 operational parameters for future use.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog box.



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

- 3 In the **Factory Settings** list, click the requested factory setting.
- 4 Click **Activate Selected Setting**.
- 5 In the **Setting** dialog box, click **OK** to accept the suggested name.

- 6 You can also choose a different name.

If you have a keyboard connected to the EK15 computer, you can click in the text field, remove the suggestion, and type any name.

Tip

If you do not have a computer keyboard connected to your EK15 system, click the **Keyboard** button to open an on-screen keyboard.

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

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

Operating principles

Like most computerized applications, the EK15 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 press 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 29
- *Trackball* on page 29

Related topics

- *The menu buttons* on page 35

Cursor

The mouse (or trackball) controls the cursor movement on the EK15 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.

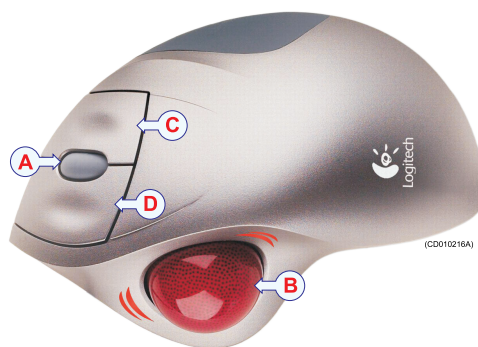
- Move the cursor over the **Title Bar** at the top of the presentation and **Status Bar** at the bottom, and left-click the icons and buttons to access the functionality provided.
- Move the cursor over the echogram, and observe the tooltip that provides detailed information about the echo information 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 dialog boxes. 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 EK15. The mouse controls the movements of the cursor, and the buttons are used to click on buttons and select parameters.

Trackball

All EK15 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. Trackballs come in several shapes and sizes. A generic version is shown as an example only.



- 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*

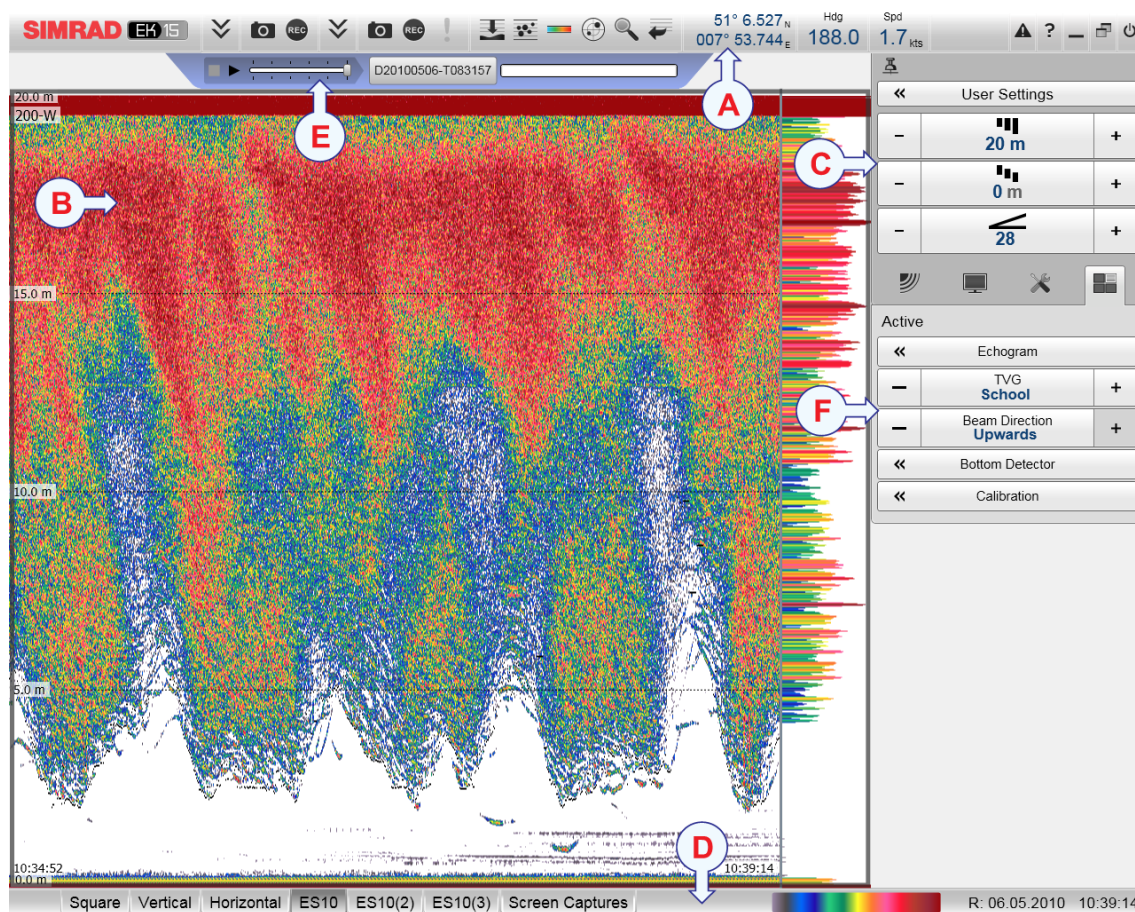
Presentation overview

The display presentation offered by the Simrad EK15 system provides a number of echograms. It also provides 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 31
- *Status Bar* on page 32
- *The menu system* on page 34
- *The menu buttons* on page 35

Echo sounder presentations



A typical EK15 display presentation is shown.

Note that the presentation is shown in mode *upwards* with the transducer positioned at the bottom looking up.

A Title Bar

The **Title Bar** identifies Simrad as the manufacturer, and the name of the product (EK15). It also provides several information fields 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.

B Echogram(s)

The **Echogram(s)** take up the largest part of the EK15 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).

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 submenus, click the buttons under the **Main** menu. To hide or retrieve the entire menu system, click the **Menu** button on the **Title Bar**.



D Status Bar

The **Status Bar** is located at the bottom of the EK15 presentation.

E Replay Bar

During replay a dedicated **Replay Bar** is provided below the **Title Bar**. The **Replay Bar** allows you to retrieve saved files, and to control the playback.

F Submenus

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



G Information panes

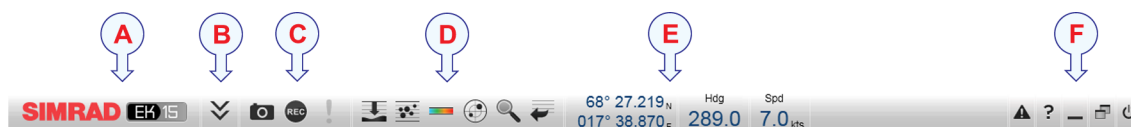
You can choose from several **Information panes** to provide you with additional data. These panes are selected from the buttons on the **Title Bar**. The panes can be moved around on the echogram presentation, and you can change their sizes. The panes are transparent, so echogram information displayed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

Title Bar

The EK15 **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 box, 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 Simrad as the manufacturer of the EK15, and the product name.

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 fields providing current data related to the vessel movements.

F Function buttons

These buttons are used to control basic system functions.

- **Alarm:** Click this button to open the **Messages** dialog box. 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 EK15 presentation.
- **Exit:** Click this button to close down the EK15 application.

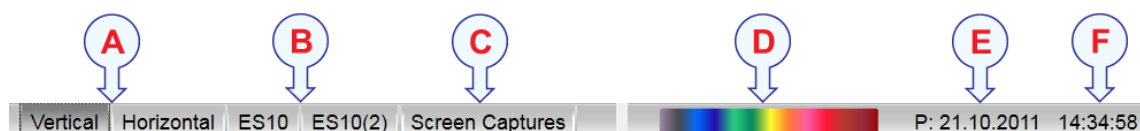
Related topics

- *Powering up the EK15* on page 16
- *Powering down the EK15* on page 17
- *Logo and product name* on page 77
- *Menu button* on page 77
- *Screen Capture button* on page 78
- *Record button* on page 78
- *Information pane icons* on page 79
- *Navigation Field* on page 80
- *Function buttons* on page 82

Status Bar

The **Status Bar** is located at the bottom of the EK15 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.
- **Square:** This tab places your current echograms in a rectangular 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 EK15. 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.

- **ES10:** This tab allocates the EK15 presentation to only show the echogram from this transducer.
- **ES10(2):** This tab allocates the EK15 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.

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 your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

However, as the number of colours can differ, and dedicated colour schemes can be used, this is not necessarily correct. A high numeric TVG value displays weak echo signals properly while the stronger signals saturate into the darker colours. A low numeric value displays strong echo signals properly. Weak signals below the lower limit of the colour scale are not displayed (the display background colour is used).

If you choose to use many colours, the resolution of the EK15 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 box on the **Display** menu. You can also access the colour scale using the **Colour Scale** information pane.

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 76
- *Screen captures* on page 99
- *Colour Scale information pane* on page 95

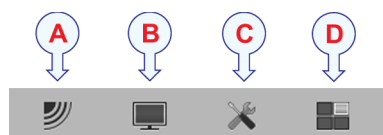
The menu system

The menu system on the EK15 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 box, 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.

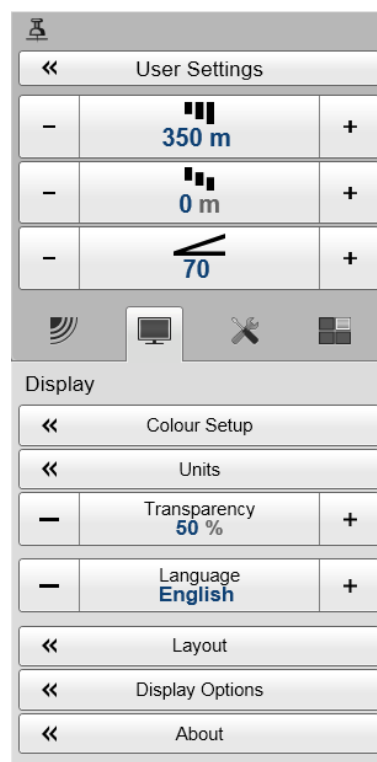
The selection of operational parameters on the EK15 is done using a tree structure with a main menu, a set of submenus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

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



Below the main menu, dedicated buttons are used to open the submenus. 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.

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

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 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 value.
- 3 Release the scroll wheel when the requested value is shown.

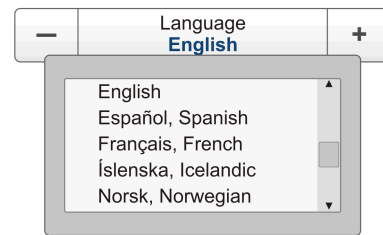


How to select a parameter using a submenu

- 1 Click the middle section of the button to open a submenu, then click the requested command, option or button.

The chosen value is applied, and the submenu is automatically closed.

- 2 Whenever applicable, you can also access the submenu by clicking the left and right side of the button.
 - a Click on the left side of the button to select a 'lower' submenu choice.
 - b Click on the right side of the button to select a 'higher' submenu choice.



How to select parameters using a dialog box

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



Context sensitive on-line help

The EK15 is provided with an extensive context sensitive on-line help system. All information of the *EK15 Reference manual* is also provided in the on-line help. The on-line help is located in a single proprietary Microsoft CHM file. This CHM file will also run on any other computer provided that the computer runs a Microsoft operating system.

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

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

Operational procedures

This chapter contains several operational procedures explaining how you can put your EK15 to use.

Menu navigation employed by Simrad EK15 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 submenus or dialog boxes. Menu choices shown in dark colours are not available for the current operation or operational mode.

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

Topics

- *User setting procedures* on page 38
- *User preference procedures* on page 40
- *Save and recall echograms* on page 43
- *Presentation procedures* on page 49
- *Echogram procedures* on page 52
- *Range procedures* on page 60
- *Bottom detection procedures* on page 62
- *Biomass procedures* on page 63
- *Gain procedures* on page 65
- *Transmit power and pulse duration procedures* on page 67

Related topics

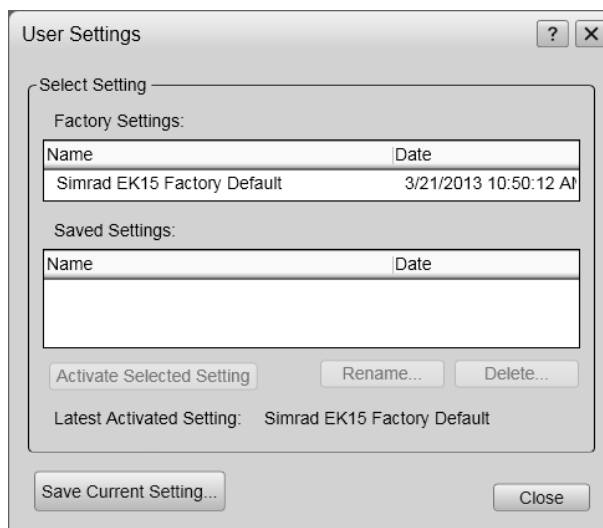
- *Powering up the EK15* on page 16
- *Powering down the EK15* on page 17
- *Starting normal operation* on page 18

User setting procedures

The EK15 allows you to save 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 EK15 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 EK15, you can also retrieve the factory default settings.



Topics

- *Saving the current user settings* on page 38
- *Using previously saved settings* on page 39
- *Choosing EK15 factory default settings* on page 39

Saving the current user settings

Purpose

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 EK15 operational parameters for future use.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog box.



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

- 3 In the **Factory Settings** list, click the requested factory setting.
- 4 Click **Activate Selected Setting**.
- 5 In the **Setting** dialog box, click **OK** to accept the suggested name.

- 6 You can also choose a different name.

If you have a keyboard connected to the EK15 computer, you can click in the text field, remove the suggestion, and type any name.

Tip

If you do not have a computer keyboard connected to your EK15 system, click the **Keyboard** button to open an on-screen keyboard.

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

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

Using previously saved settings

Purpose

If you have saved operational parameters and/or configurations dedicated for different gears or 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 EK15 presentation.
- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog box.



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

- 3 In the **User Setting** dialog box, 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 box.

Choosing EK15 factory default settings

Purpose

This procedure explains how to choose the factory or saved parameter settings. Use this if you need to reset the EK15 to known settings.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.

- 2 On the **Main** menu, click **User Settings** to open the **User Settings** dialog.



The **User Settings** dialog box allows you to save the current user settings (parameter selections), and to retrieve factory or previously saved 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 40
- *Choosing colour presentation theme (palette)* on page 41
- *Selecting measurement units* on page 41
- *Verifying or changing the environmental parameters* on page 42
- *Opening the context sensitive on-line help* on page 42

Selecting menu language

Purpose

The menu buttons – as well as other texts – in the EK15 presentation are available in several languages. This procedure explains how to select a different language.

Related topics

- *Display menu* on page 106

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 Click the **Display** button to open the menu.

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

- 3 Click the middle of the **Language** button to open a submenu with the 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 submenu closes, 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 EK15 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 EK15. If your language is *not* offered, the English on-line help will appear.

Choosing colour presentation theme (palette)

Purpose

The EK15 presentation may be set up using one of several colour themes. In the menu system, these are called *palettes*.

Description

The **Palette** function provides you with options for the colour scheme used on the EK15 display presentation. 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 EK15 performance.

Procedure

- 1 Click the **Display** button to open the menu.

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



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



The purpose of the **Colour Setup** dialog box is to control the presentation colours used by the EK15.

- 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 box.

Selecting measurement units

Purpose

This procedure explains how to change the measurement units in the EK15 presentations.

Description

The EK15 is prepared to work with several standards for units of measurements.

Use the **Units** dialog box to set up the various units of measurements you wish to work with. The EK15 will use these in all presentations. Normally, you will only need to define these once.

Procedure

- 1 Click the **Display** button to open the menu.

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



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



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

Verifying or changing the environmental parameters

Purpose

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.

- 2 Click the **Installation** button to open the **Installation** submenu.



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



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

- 3 Make the necessary adjustments.
- 4 To set up the environmental parameters:
 - a Specify if you work in fresh or salt water.
 - b If you have an instrument that offers a more accurate sound speed value than the default entry, change it.
 - c If you have sensor that reads the water temperature, connect to it.
- 5 Click **OK** to save the current settings and close the dialog box.

Opening the context sensitive on-line help

Purpose

This procedure explains how to access the context sensitive on-line help.

Description

The EK15 is provided with an extensive context sensitive on-line help system. All information of the *EK15 Reference manual* is also provided in the on-line help. The on-line help is located in a single proprietary Microsoft CHM file. This CHM file will also run on any other computer provided that the computer runs a Microsoft operating system.

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

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

Related topics

- *Context sensitive on-line help* on page 36

Procedure

1 Method 1:

Click the [?] icon on the **Title bar**. This will open the on-line help file on its start page.

2 Method 2:

Click the **Help** button in any dialog box. The description of the related dialog box will appear in the help window.

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 43
- *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

Purpose

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

On the EK15, 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 EK15 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

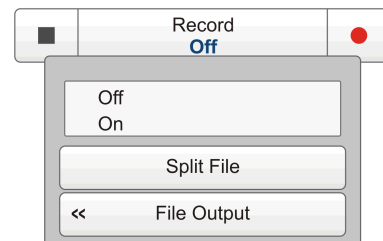
- 1 Observe the **Screen Capture** button on the **Title Bar**.
- 2 Click the button to save the current display presentation.
The screen capture is saved on the hard disk in standard JPG format.
The recorded capture includes the entire presentations, and thus includes the current echograms and the menu.
- 3 To recall the screen capture, see *Recalling single echogram images* on page 46.

Saving echogram sequences (raw data)

Purpose

This procedure explains how to store raw EK15 data. Each sequence of raw data – often regarded as a “line” during a survey – contains a set of acoustic data saved on digital format.

Once saved, you can play back this data just as if it was “normal” EK15 data, or use it for post-processing purposes by third party programs.



Description

On the EK15, 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 EK15 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 EK15 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
- *Replay bar* on page 84

Procedure

- 1 Click the **Operation** icon.

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



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

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

Important

This is the default directory for raw data:

Windows 7: `c:\programdata\\simrad\EK15\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 EK15. 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 box.

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

Purpose

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.
- 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)

Purpose

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

Important

The system is not operational when you have chosen *Replay* mode: the EK15 is then not able to transmit.

Related topics

- *Saving echogram sequences (raw data)* on page 44
- *Recalling echogram sequences (raw data)* on page 46
- *Replay bar* on page 84

Procedure

- 1 Click the **Operation** icon.

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



- 2 Click the **Operation** button to open the menu choices.
- 3 Click **Replay File** to open the **Replay File** dialog box.



The purpose of the **Replay File** dialog box 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 box:
 - 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 box.
 - c Click **OK** to save the current settings and close the dialog box.
- 5 Click the **Operation** button to open the menu choices.
- 6 Click **Replay** to select this function.
Observe that the **Replay bar** opens.
- 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 Return to normal operational mode using the **Operation** button.

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

Purpose

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.
- 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.
This is the default directory for the bitmap images:
Windows 7: `c:\programdata\Simrad\EK15\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 EK15 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 program.
- 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

Purpose

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.
- 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 box.

Important

This is the default directory for raw data:

Windows 7: `c:\programdata\simrad\EK15\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 EK15 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 program.
- 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 EK15 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

Purpose

This procedure explains how you can modify the size of each individual view and field in the EK15 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 views or 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

Purpose

Your EK15 may be set up with one or more transceivers and transducers (channels).

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

Related topics

- *Status Bar* on page 97

Procedure

- 1 Observe the buttons on the **Status bar** at the bottom of the EK15 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

Selecting which echograms to display

Purpose

Your EK15 may be set up with one or more transceivers and transducers (channels).

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

Procedure

- 1 Click the **Display** button to open the menu.

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



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



The purpose of the **Layout** dialog box 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 box.

Selecting colour scale and presentation palette

Purpose

This procedure explains how to change the colour scale and the presentation palette on the EK15 echograms.

Description

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 box on the **Display** menu.

Procedure

- 1 Click the **Display** button to open the menu.

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



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



The purpose of the **Colour Setup** dialog box is to control the presentation colours used by the EK15.

- 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 your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

However, as the number of colours can differ, and dedicated colour schemes can be used, this is not necessarily correct. A high numeric TVG value displays weak echo signals properly while the stronger signals saturate into the darker colours. A low numeric value displays strong echo signals properly. Weak signals below the lower limit of the colour scale are not displayed (the display background colour is used).

If you choose to use many colours, the resolution of the EK15 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 box.

Changing the colour scale to remove the weakest echoes

Purpose

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

Description

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 box on the **Display** menu.

Related topics

- *Colour Scale information pane* on page 95

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.



- 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 EK15 echogram.

Topics

- *Changing the 'ping' parameters* on page 53
- *Selecting echogram type* on page 54
- *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 box* on page 57
- *Removing interference using sequential pinging* on page 59
- *Making it easier to see the bottom using White Line and Bottom Line* on page 59

Changing the 'ping' parameters

Purpose

This procedure explains how to control how often the EK15 transmits acoustic energy into the water. This is normally referred to as 'pinging'.

Description

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 EK15, 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 EK15 is a lot faster, and you may send out a ping even before the energy from the previous ping has disappeared.

When transmission is enabled, you can choose from these ping modes:

1 Single step

This option allows the EK15 to transmit single pings.

To transmit a single ping, click the ping symbol on the right side of the **Ping** button.

2 Interval

This option allows the EK15 to transmit once every chosen time interval.

The time interval (in milliseconds) is chosen with the **Ping Interval** function.

3 Maximum

This option allows the EK15 to transmit at maximum speed.

The ping interval is basically only limited by the maximum depth range.

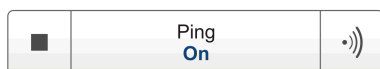
It will also be dependant on hardware issues. This may be, for example, how fast your computer can handle the information from each ping, how fast your system communicates with external peripherals, or how long time the system uses to save data.

Procedure

1 Click the **Operation** icon.

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

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



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

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

3 Choosing maximum ping rate:

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

This will make the EK15 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 Defining a ping interval:

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

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



5 Transmitting 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

Purpose

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

Description

On the EK15 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 box; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **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.

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.

Procedure

- 1 Click the **Active** icon.

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



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



The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, 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 box.

Adding horizontal markers to the echogram

Purpose

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

Description

The echograms provided by the EK15 may be set up to contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 90
- *White line* on page 90
- *Variable depth line* on page 91
- *Range other lines* on page 91

- *Biomass line* on page 91
- *Range scales* on page 92
- *Vertical ticks* on page 92
- *Annotations* on page 93

Procedure

- 1 Click the **Active** icon.

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



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



The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, 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.
- 5 Click **OK** to save the current settings and close the dialog box.

Adding vertical markers and annotations to the echogram

Purpose

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

Description

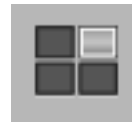
The echograms provided by the EK15 may be set up to contain additional information. The following lines, markers and annotations can be enabled:

- *Bottom line* on page 90
- *White line* on page 90
- *Variable depth line* on page 91
- *Range other lines* on page 91
- *Biomass line* on page 91
- *Range scales* on page 92
- *Vertical ticks* on page 92
- *Annotations* on page 93

Procedure

- 1 Click the **Active** icon.

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



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



The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, 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 box, but to place the annotations in the echogram, you must enable them in the **Echogram** dialog box.*

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

Selecting TVG gain in the Echogram dialog box

Purpose

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

Description

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 EK15 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The EK15 does not have a TVG compensated receiver like most other echo sounders. In the EK15 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)

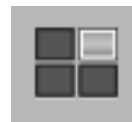
This setting allows you to define your own TVG setting.

Procedure

- 1 Click the **Active** icon.

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

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



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

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

Removing interference using sequential pinging

Purpose

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.

Description

The **Sequential pinging** function can be used if you have more than one transceiver/transducer in use on the EK15 system. When activated, each individual transceiver will ‘ping’ in sequence, one by one. When not activated, all transceivers will ‘ping’ simultaneously.

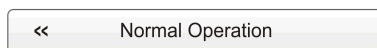
Procedure

- 1 Click the **Operation** icon.

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



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



The purpose of the **Normal Operation** dialog box 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 box.

Making it easier to see the bottom using White Line and Bottom Line

Purpose

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

Description

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

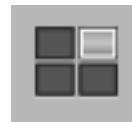
Related topics

- *Echogram markers* on page 90
- *Active menu* on page 108

Procedure

- 1 Click the **Active** icon.

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



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



The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, 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 box.

Range procedures

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

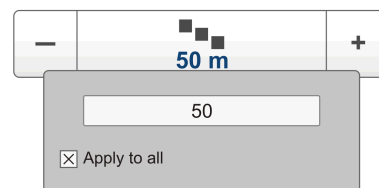
Topics

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

Choosing start depth

Purpose

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



Example 4 *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.

Procedure

The following methods may be used.

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

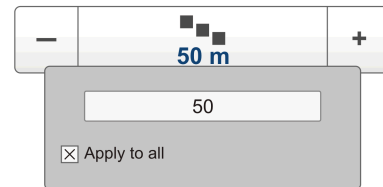
- a** Click the middle of the button to open it.
- b** Type any depth value from the keyboard.

Choosing automatic start depth

Purpose

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 5 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 EK15 will automatically move the start range down. The range is kept, but as the start range is moved, the bottom contour is still visible.

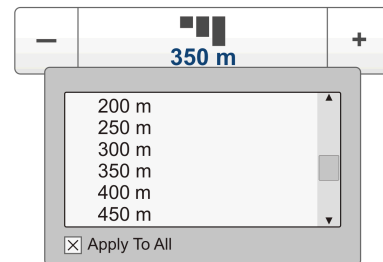
Procedure

- 1** Observe the **Main** menu. It is normally located on the right hand side of the EK15 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

Purpose

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 **Range** on the **Main** menu.



Example 6 *Start Range and Range in bottom related echogram*

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

Procedure

The following methods can be used.

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

Purpose

When you use the EK15 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 EK15 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 EK15 will then not be able to detect the bottom at all, and the displayed depth will be 0.00 m

Related topics

- *Active menu* on page 108

Procedure

- 1 Click the **Active** icon.

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



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



The purpose of the **Bottom Detector** dialog box is to define the upper and lower depth limits most likely to be used during the EK15 operation. In this dialog box, 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 EK15 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 EK15 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 box.

Biomass procedures

Observe these procedures related to biomass measurements.

Topics

- *Monitoring the current biomass* on page 63
- *Enabling the biomass line* on page 64

Monitoring the current biomass

Purpose

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

Description

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

Related topics

- *Biomass information pane* on page 94
- *Echogram markers* on page 90

Procedure

- 1 Click the **Biomass** icon.

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



- 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

Purpose

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

Description

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

Related topics

- *Biomass information pane* on page 94
- *Echogram markers* on page 90
- *Active menu* on page 108

Procedure

- 1 Click the **Active** icon.

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



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



The **Echogram** dialog box allows you to set up the parameters controlling the echogram presentation. The three tabs control the horizontal lines, the echogram type with applied TVG, 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 box.

Gain procedures

These procedures explain how you can adjust the gain in the EK15. This controls how “powerful” the echoes are shown in the echo presentations. The EK15 uses two principles for gain; *signal amplification* and *time varied gain (TVG)*.

Topics

- *Adjusting the signal gain* on page 65
- *Adjusting the TVG gain on the Active menu* on page 66

Adjusting the signal gain

Purpose

This procedure explains how to change the gain.

Description

You can compare this gain setting with the volume control on your car radio. When the gain is increased, the echoes will appear stronger. Weak echoes will be easier to see. However, since you also increase the acoustic noise in the reception, the EK15 echo presentations will also show this. Too much gain will thus “distort” the presentation.

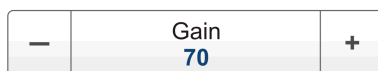
By default, the gain setting applies only to the currently selected echogram (identified with a thick border). Several echogram types are available, these are selected in the **Echogram** dialog box. If you wish to adjust the gain on all similar echograms in your view, click to select **Apply to all**.

Tip

Do not confuse this **Gain** function with the **TVG** function.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.
- 2 Observe the **Gain** button on the **Main** menu.



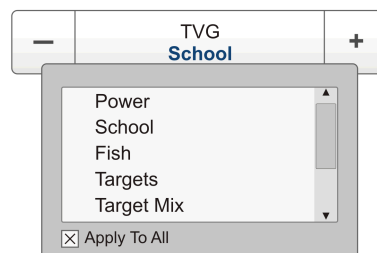
- 3 **Method 1**
 - a Click [+] or [-] to choose gain.
- 4 **Method 2**
 - a Click the middle of the **Gain** button, hold the mouse button depressed.
 - b Drag the cursor left or right to increase or decrease the gain.
- 5 **Method 3** can only be used if you have a keyboard
 - a Click the middle of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

Adjusting the TVG gain on the Active menu

Purpose

This procedure explains how to change the Time Varied Gain (TVG).

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



Description

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 EK15 has a TVG range down to 15 000 meters, which for all practical purposes is unlimited. The EK15 does not have a TVG compensated receiver like most other echo sounders. In the EK15 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.

Related topics

- *Selecting TVG gain in the Echogram dialog box* on page 57
- *Active menu* on page 108

Procedure**1 Click the Active icon.**

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

**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 submenu.
- b** Click on any TVG setting to select it.

Transmit 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 67
- *Adjusting the pulse duration (length)* on page 68

Choosing passive mode of operation

Purpose

In order to check how much noise the EK15 is receiving, you can set it to *Passive* mode. This means that the EK15 is not transmitting sound pulses into the water, it is only “listening”.

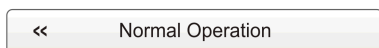
Procedure

- 1 Click the **Operation** icon.

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



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



The purpose of the **Normal Operation** dialog box 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 box.

Adjusting the pulse duration (length)

Purpose

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. The longer pulse duration will provide longer range, but reduced vertical resolution.

These filters will reduce the EK15'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.

Related topics

- *Pulse duration* on page 122

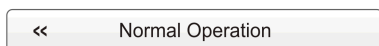
Procedure

- 1 Click the **Operation** icon.

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



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



The purpose of the **Normal Operation** dialog box 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.
- 4 Click **OK** to save the current settings and close the dialog box.

EK15 calibration

This chapter explains how to do a single beam calibration of the Simrad EK15.

Topics

- *Basic information about calibration* on page 70
- *Calibration procedure* on page 71

Basic information about calibration

In order to maintain the accuracy provided by the Simrad EK15 and that is required for scientific applications, it must be calibrated.

Calibration is also a very efficient tool to verify that the Simrad EK15 system is fully operational.

During calibration a reference target with known target strength is lowered into the sound beam, and the measured target strength is compared with the known target strength. If it is necessary to adjust the EK15, this is done automatically by the calibration software.

Since the EK15 is digital right from the receiver front end, no analogue gain adjustment is required.

We strongly recommend that this calibration is done with the acoustic beam pointing vertically in open water. This is best accomplished from an anchored boat in an area with homogenous water; no thermal or salinity layers, and no current. The depth must be minimum 5 meters.

Observe the dedicated procedure for single beam calibration.

Important

If you later choose to uninstall a transducer, the transceiver must be calibrated one more time. However, you may reenter the measured target strength (TS) from a previous calibration, as well as the reference target strength for the calibration sphere you used.

If you have a EK15 system with several transceivers, you must calibrate one by one. Make sure that you set all other transceivers to *Passive* in the **Normal Operation** dialog box.

Transducer maintenance

Depending on the environmental conditions where the vessel operates, fouling must be removed from time to time. Failing to do so will degrade the echo sounder performance. Use a soft piece of wood and remove the fouling carefully. Afterwards, use a very fine grade emery paper.

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.

Calibration procedure

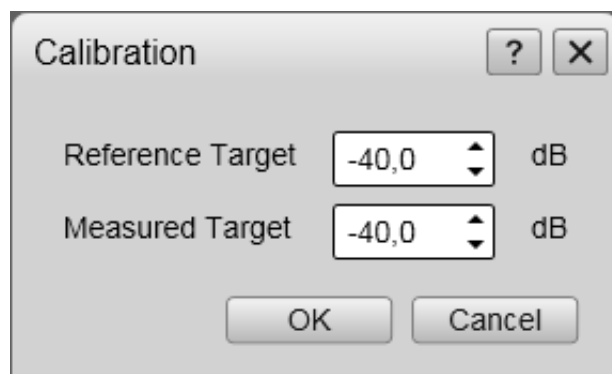
Purpose

This procedure explains how to do a single beam calibration of the Simrad EK15.

Prerequisites

In order to do this calibration, observe the following prerequisites:

- The calibration must be done in open water. This is best accomplished from an anchored boat in an area with homogenous water; no thermal or salinity layers, and no current.
- You need a calibration sphere. The sphere available for 200 kHz is made of copper, and it has a diameter of 13.7 mm. Its nominal target strength varies around -45 dB re.1m² depending on temperature, sound speed and pulse duration. See the documentation provided with your sphere, and select the target strength closest to your settings for actual environmental conditions.



Procedure

- 1 Lower the calibration sphere to a water depth of minimum 5 meters.
For best results, 8 to 15 meters depth is recommended.
- 2 Set the ping interval on the EK15 to 1 s.
→ *Changing the 'ping' parameters* on page 53
- 3 Verify or define the environmental parameters.
If you have a temperature gradient, use the mean water column temperature.
→ *Verifying or changing the environmental parameters* on page 42

- 4 Set up the EK15 to store the raw data recorded during the calibration process.

Raw data storage is strictly not needed, but it is a good routine to store them, and they can also be used for later calibration.

→ *Saving echogram sequences (raw data)* on page 44

- 5 Adjust the position of the calibration sphere so that it is located as close as possible to the centre of the acoustic beam.

- 6 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. The view is “from above”. The colour indicates the echo strength.

→ *Fish Position information pane* on page 96

- 7 Place the mouse pointer in the “bulls eye”.

- 8 Read the target strength (TS) value of the sphere, and write down the maximum value after a period of minimum one minute.

- 9 Click the **Active** icon.

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



→ *Active menu* on page 108

- 10 Click the **Calibration** button to open the **Calibration** dialog box.



The purpose of the **Calibration** dialog box is to accept the reference target and measured target results from the system calibration.

- 11 Type in the reference target strength (TS) for the calibration sphere in use.

This is a known value taken from the documentation provided with the sphere.

- 12 Type in the measured target strength (TS) from your notes.

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

- 14 Set the EK15 to *Inactive* mode, and then back to *Normal*.

This is necessary for the calibration values to take effect.

Display views

The display views provided by the Simrad EK15 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.

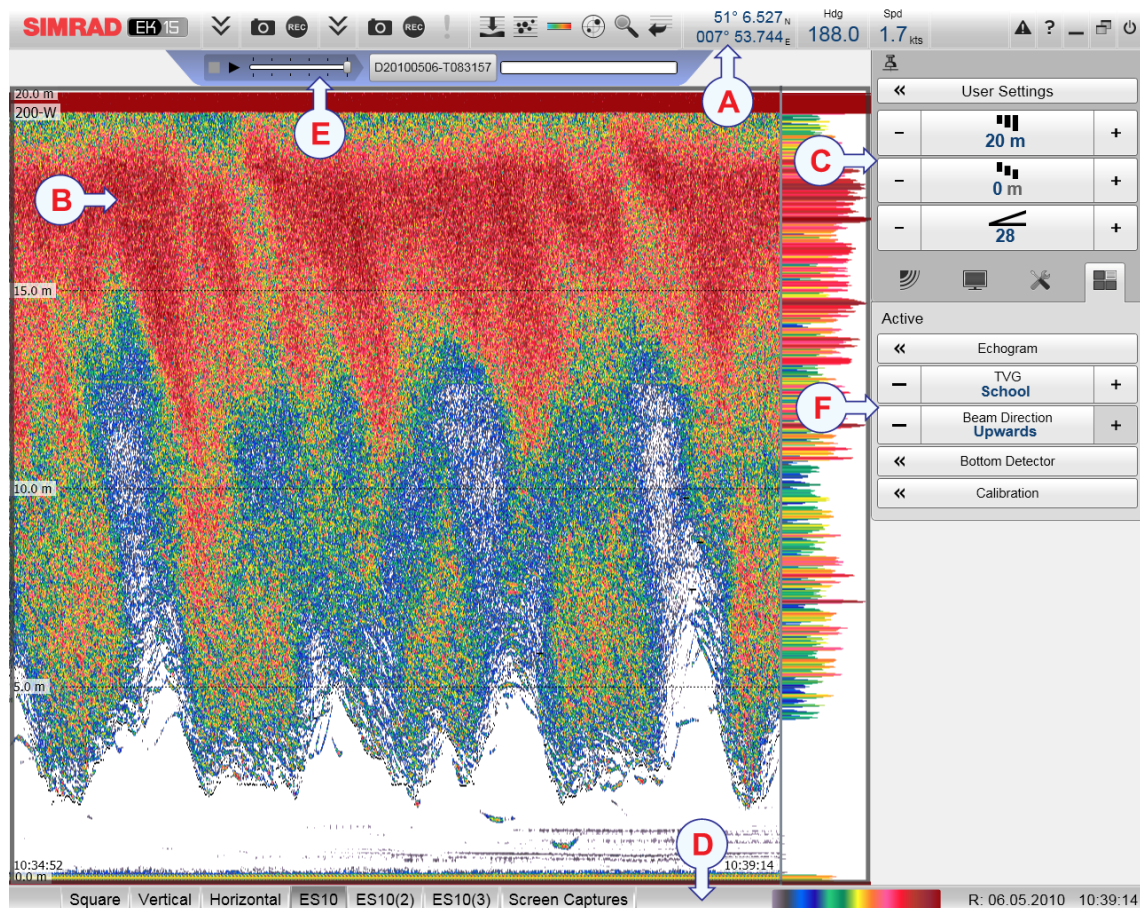
This chapter provides a brief overview of the information displayed by the Simrad EK15, and how the information is organized.

Topics

- *Display organization* on page 74
- *Title Bar* on page 76
- *Replay bar* on page 84
- *Menu system* on page 85
- *Echograms* on page 86
- *Echogram markers* on page 90
- *Information panes* on page 93
- *Status Bar* on page 97
- *Screen captures* on page 99

Display organization

By default, the EK15 display presentation covers the entire screen view.



A typical EK15 display presentation is shown.

Note that the presentation is shown in mode *upwards* with the transducer positioned at the bottom looking up.

A Title Bar

The **Title Bar** identifies Simrad as the manufacturer, and the name of the product (EK15). It also provides several information fields 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.

B Echogram(s)

The **Echogram(s)** take up the largest part of the EK15 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).

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 submenus, click the buttons under the **Main** menu. To hide or retrieve the entire menu system, click the **Menu** button on the **Title Bar**.

**D Status Bar**

The **Status Bar** is located at the bottom of the EK15 presentation.

E Replay Bar

During replay a dedicated **Replay Bar** is provided below the **Title Bar**. The **Replay Bar** allows you to retrieve saved files, and to control the playback.

F Submenus

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

**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.

Related topics

- *Title Bar* on page 76
- *Echograms* on page 86
- *Replay bar* on page 84
- *Menu system* on page 85
- *Information panes* on page 93
- *Status Bar* on page 97

Title Bar

The EK15 **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

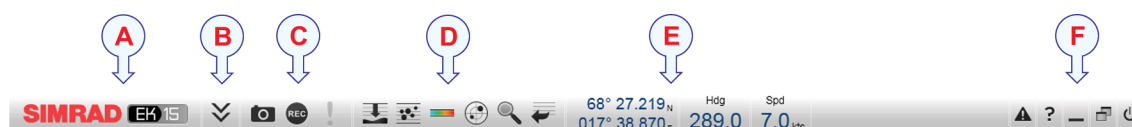
- *Purpose and description* on page 76
- *Logo and product name* on page 77
- *Menu button* on page 77
- *Screen Capture button* on page 78
- *Record button* on page 78
- *Information pane icons* on page 79
- *Navigation Field* on page 80
- *Function buttons* on page 82

Purpose and description

The EK15 **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 box, 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 Simrad as the manufacturer of the EK15, and the product name.

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 fields providing current data related to the vessel movements.

F Function buttons

These buttons are used to control basic system functions.

- **Alarm:** Click this button to open the **Messages** dialog box. 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 EK15 presentation.
- **Exit:** Click this button to close down the EK15 application.

Related topics

- *Logo and product name* on page 77
- *Menu button* on page 77
- *Screen Capture button* on page 78
- *Record button* on page 78
- *Event button* on page 78
- *Information pane icons* on page 79
- *Navigation Field* on page 80
- *Function buttons* on page 82

Logo and product name

The **Logo and Product name** is located on the left side of the **Title Bar** at the top of the EK15 presentation.



The Simrad logo and the product name (EK15) is shown.

Double-click the Simrad logo to reduce the size of the EK15 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 EK15 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 101

Screen Capture button

The **Screen Capture** button is located on the left side of the **Title Bar** at the top of the EK15 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 43
- *Recalling single echogram images* on page 46
- *Screen captures* on page 99

Record button

The **Record** button is located on the left side of the **Title Bar** at the top of the EK15 presentation.



Click this button to start and stop recording.

Remember to stop the recording when you have finished the job! If you forget, your hard disk may be filled!

Note

Raw data files will normally become very large. If you wish to record large amounts of EK15 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 EK15 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 box.

Information pane icons

The **Information pane** icons are located on the **Title Bar** at the top of the EK15 display presentation.

The Simrad EK15 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.

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 94

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.



Related topics

- *Biomass information pane* on page 94

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 EK15 presentation. You can also manually modify the colour scale to filter out weak echoes.



Related topics

- *Colour Scale information pane* on page 95

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.



Important

The **Fish Position** information pane is normally only used on split beam transceivers. However, on the EK15 it is used as a tool to read correct target strength (TS) during single beam calibration.

Related topics

- *Fish Position information pane* on page 96

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 96

History

Click this button to open and close the **History** pane. The EK15 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 97

Navigation Field

The navigational information is located on the **Title Bar** at the top of the EK15 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 box from the **Display** submenu.

Note

*This information on the **Title Bar** must not be used for vessel 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 EK15 display presentation.



68° 27.227^N
017° 38.794^E

Provided that a GPS system is connected to the EK15, this field on the **Title Bar** will display the vessel's geographical position in longitude and latitude.

Heading

The **Heading** information is provided in the **Navigation Field** on the **Title Bar** at the top of the EK15 display presentation.



Hdg
292.0

Provided that the relevant sensor is connected to the EK15, this field on the **Title Bar** will display the vessel's current heading.

Speed

The **Speed** information is provided in the **Navigation Field** on the **Title Bar** at the top of the EK15 display presentation.



Spd
7.0 kts

Provided that a GPS or speed log system is connected to the EK15, 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.

Depth

The depth information is provided in the **Navigation Field** on the **Title Bar** at the top of the EK15 display presentation.

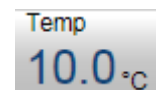


Depth 200-W
11.4_m

The current depth for one of the transducers connected to the EK15 is shown.

Temperature

The temperature information is provided in the **Navigation Field** on the **Title Bar** at the top of the EK15 display presentation.



Temp
10.0 °C

Note that temperature information can only be provided if a suitable sensor is connected to the EK15 system.

Function buttons

The **Function** buttons are located on the right side of the **Title Bar** at the top of the EK15 presentation.



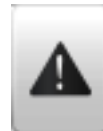
Message button

The **Message** button is located at the right side of the **Title Bar** at the top of the EK15 presentation.

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

By flashing, this **Message** button indicates that the EK15 system has issued a message.

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 EK15 presentation.

Click this button to open the EK15 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 dialog boxes in the EK15. Click any **Help** button [?] in the top right corner of any dialog box to open the help system.



Related topics

- *Context sensitive on-line help* on page 36

Minimize button

The **Minimize** button is located at the right side of the **Title Bar** at the top of the EK15 presentation.

Click this button to minimize the EK15 display presentation. This is an operating system function.

To restore the presentation to its previous size, click the EK15 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 EK15 presentation.

Click this button to change the size of the EK15 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 EK15 presentation.

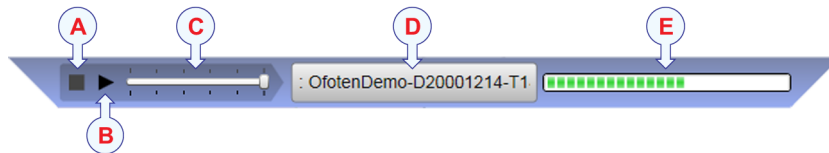
Click this button to close the EK15 program.

Observe the dedicated procedure to power down the EK15 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.

Tip _____

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 box.

E Progress

This bar shows you the replay progress of the current file. If you have chosen to loop the replay file(s), the indicator bar 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 box.

Related topics

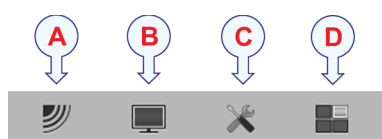
- *Operation menu* on page 105

Menu system

The menu system is by default located on the right hand side of the EK15 presentation.

The selection of operational parameters on the EK15 is done using a tree structure with a main menu, a set of submenus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

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



Below the main menu, dedicated buttons are used to open the submenus. 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.

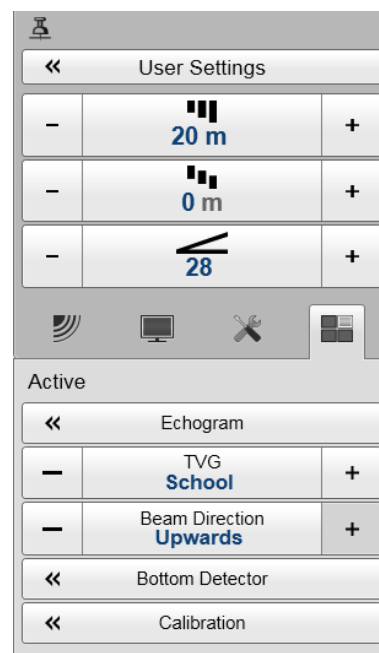
Tip

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



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

You can also place the menu on the left side of the EK15 presentation by clicking **Menu on the right side** in the **Display Options** dialog box.



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

Related topics

- *Selecting menu language* on page 40
- *The menu system* on page 101

Echograms

The various echogram types supported by the EK15 are explained.

Topics

- *Surface echogram* on page 86
- *Bottom echogram* on page 87
- *Pelagic echogram* on page 88
- *“Upwards” echogram* on page 89

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*.

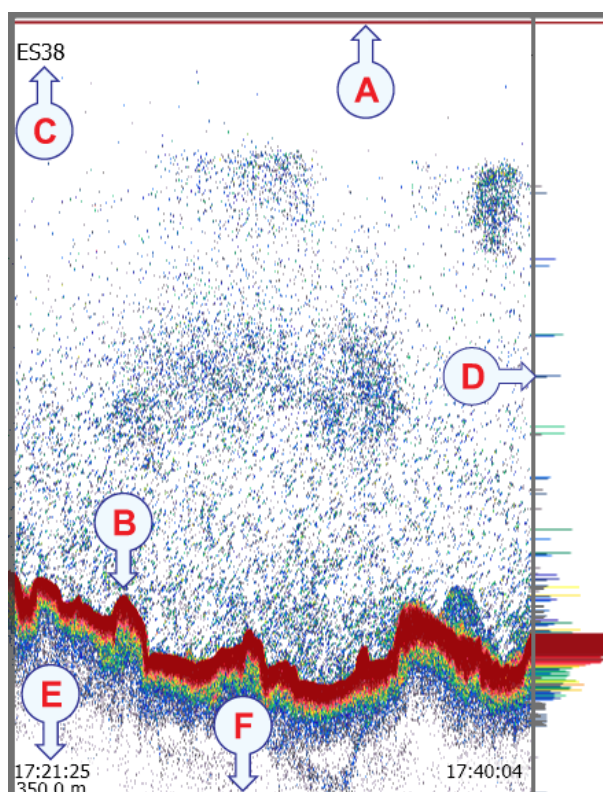
- C** This text identifies the transducer used to create the echogram.

- 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 box.

- 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 7 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 box; within a given time frame, a defined number of pings, or a portion of the echogram view. The data is then taken from an echo area starting immediately after the transmit pulse, and ending just over the detected depth.

If you have limited your vertical range (using the **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.

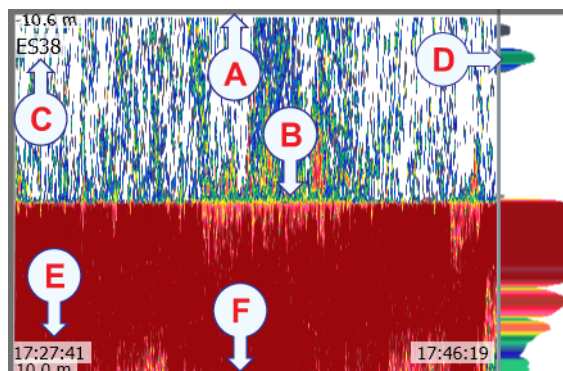
The range from the start depth above the bottom and down to some distance below the actual bottom is defined with the **Range** button on the **Main** menu.

- 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 box.



- 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 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.

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 9 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.

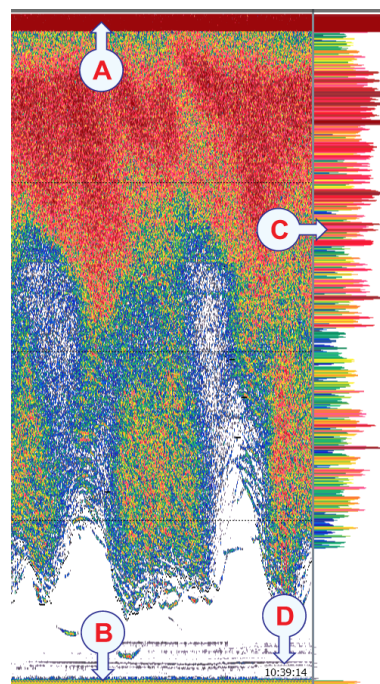
The biomass calculations are not restricted by the bottom detection. This means that the bottom echo will be included in calculations if it appears within the chosen range.

“Upwards” echogram

The EK15 is a unique product. One of its many areas of application is in fish farming. One single EK15 installation can then be used to monitor the fish behaviour and food waste in a large number of fish cages. The transducers are then physically installed inside the cages with the transducer facing upwards.

The EK15 transducers can also be placed at the seabed in open water - or in a river - for long-term monitoring of the ecosystem. Due to the fact that several transceivers and transducers can be connected simultaneously, you can for example establish an acoustic “fence” to monitor fish passage.

In order to adjust the echogram presentations to this use, the **Beam Direction** function is introduced. Unlike the presentation on a traditional fish finding echo sounder, you can select *Upwards*. The presentation is then adjusted for a transducer located at the bottom of the echogram looking up towards the sea surface.



- A** This is the sea surface. The thick red line is caused by the air above the water surface.
- B** This is the transducer face. The transducer is located at the bottom - or in open water - looking upwards..
- C** This is the scope view.
This view presents individual colour lines. The colour and length of each line reflects the received echo amplitude.
- D** 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 box.

Tip

Once you turn the echogram upside down, several familiar features are not so useful any longer.

For best results, use a surface echogram, set **Start Range** to 0 meters, and adjust **Range** and **Gain** for optimal echo quality.

Echogram markers

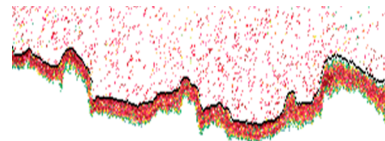
The echograms provided by the EK15 may contain additional information. The following lines, markers and annotations can be enabled.

Topics

- *Bottom line* on page 90
- *White line* on page 90
- *Variable depth line* on page 91
- *Range other lines* on page 91
- *Biomass line* on page 91
- *Range scales* on page 92
- *Vertical ticks* on page 92
- *Annotations* on page 93

Bottom line

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



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

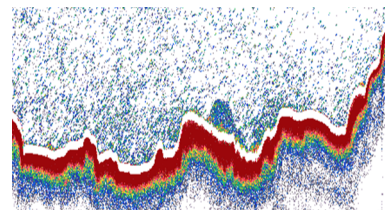
The bottom line appears as a black line, and follows the bottom contour.

Related topics

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

White line

This line marker is enabled in the **Echogram** dialog box 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.

Related topics

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

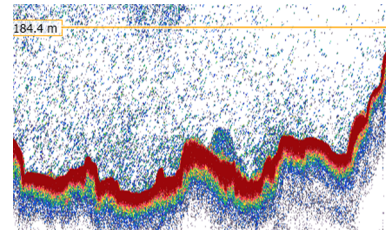
Variable depth line

This line marker is enabled in the **Echogram** dialog box 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

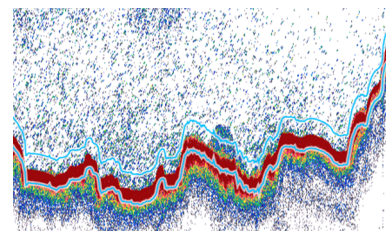
Range other lines

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



This feature is used when you set up your EK15 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 box on the **Active** menu.



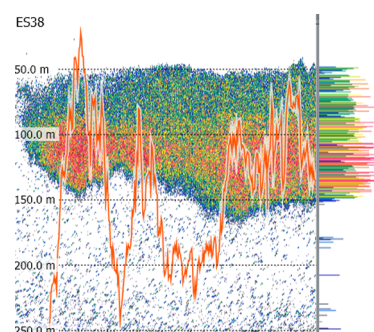
The biomass may be monitored using the **Biomass** line.

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.



Related topics

- *Biomass information pane* on page 94
- *Adding horizontal markers to the echogram* on page 55

Range scales

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



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 box on the **Active** menu.



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

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

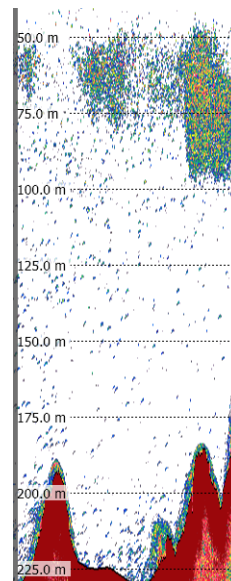
This option inserts a short vertical line is drawn in the upper part of the echogram once every specified number of nautical miles.

d Annotations

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

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 box.

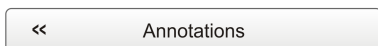


Annotations

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



The type of annotation is controlled in the **Annotation** dialog box.



Annotations may be added to the echogram to pinpoint special echoes, special events, etc. An annotation can be entered manually using the **Annotation** dialog box, 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 EK15 offers several information panes to provide additional and detailed data from the EK15 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.

Topics

- *About information panes* on page 93
- *Depth information pane* on page 94
- *Biomass information pane* on page 94
- *Colour Scale information pane* on page 95
- *Fish Position information pane* on page 96
- *Zoom information pane* on page 96
- *History information pane* on page 97

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.

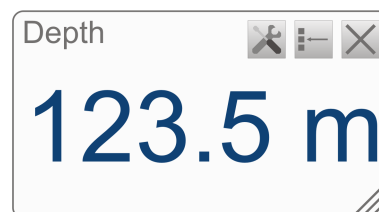
- The top right button [X] closes the information pane.
Note that you can also close the pane if you click one more time on its button on the **Title Bar**.
- The other button will restore the information pane to its original size and location.
- Some of the information panes are provided with a “tool” button. This buttons opens a dialog box 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.

The **Tool** button in the information pane opens the **Bottom Detector** dialog box. This dialog box is also available from the **Active** menu.



The purpose of the **Bottom Detector** dialog box is to define the upper and lower depth limits most likely to be used during the EK15 operation. In this dialog box, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

Related topics

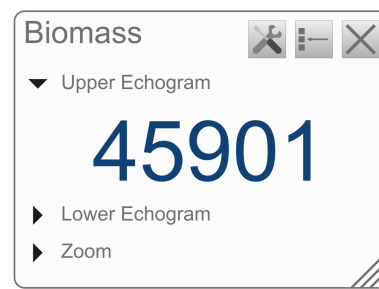
- *Active menu* on page 108

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 is shown.



The **Tool** button opens the **Calculation Interval** dialog. This dialog is also available from the **Setup** menu.

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

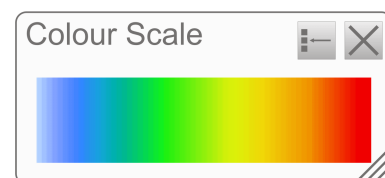
- *Biomass line* on page 91
- *Monitoring the current biomass* on page 63
- *Enabling the biomass line* on page 64
- *Biomass* on page 114

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

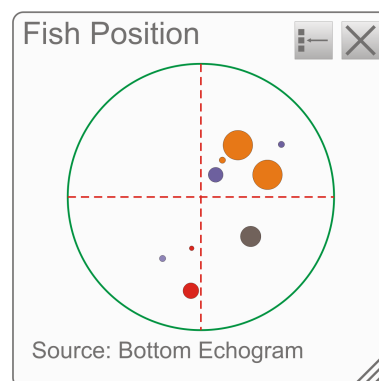
Fish Position information pane

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. The view is “from above”. The colour indicates the echo strength.

Important

The **Fish Position** information pane is normally only used on split beam transceivers. However, on the EK15 it is used as a tool to read correct target strength (TS) during single beam calibration.



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.

Related topics

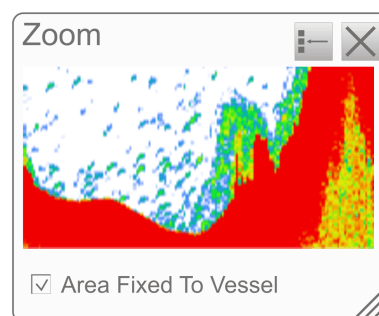
- *Basic information about calibration* on page 70
- *Calibration procedure* on page 71

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.



Parameters

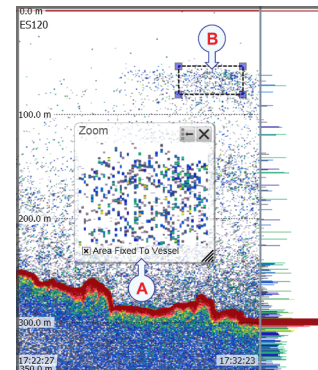
1 Area Fixed To Vessel

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.

*Example 10 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.

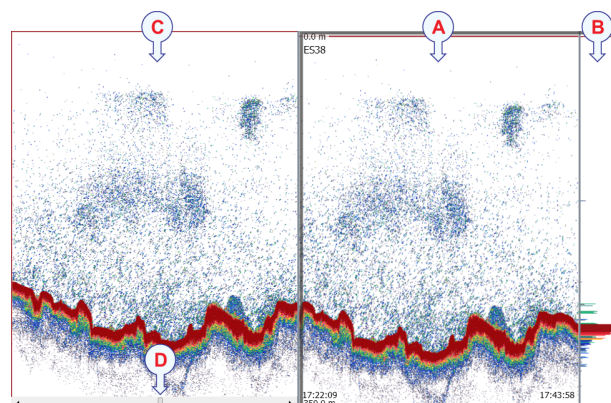
**History information pane**

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 EK15 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 11 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

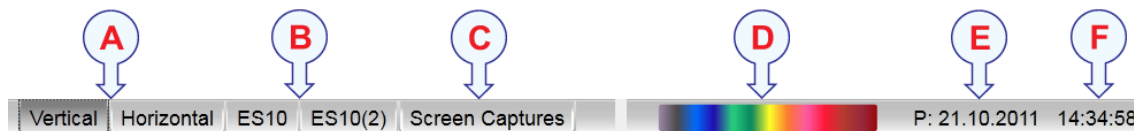
Tip _____

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 EK15 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.
- **Square:** This tab places your current echograms in a rectangular 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 EK15. 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.

- **ES10:** This tab allocates the EK15 presentation to only show the echogram from this transducer.
- **ES10(2):** This tab allocates the EK15 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.

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 your own experience.

Keep in mind that in the basic scale with 12 colours, each discrete colour represents a 3 dB range of echo signal strength. This implies that the next colour is selected every time the echo strength is doubled.

However, as the number of colours can differ, and dedicated colour schemes can be used, this is not necessarily correct. A high numeric TVG value displays weak echo signals properly while the stronger signals saturate into the darker colours. A low numeric value displays strong echo signals properly. Weak signals below the lower limit of the colour scale are not displayed (the display background colour is used).

If you choose to use many colours, the resolution of the EK15 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 box on the **Display** menu. You can also access the colour scale using the **Colour Scale** information pane.

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.

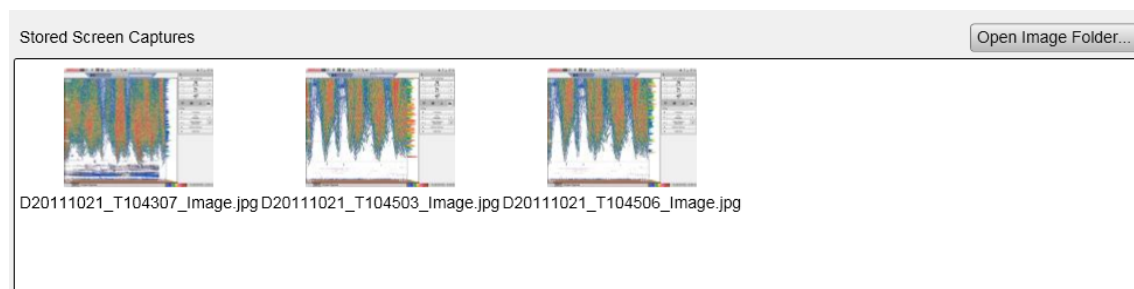
Note that during replay, the time in the replay file is shown.

Related topics

- *Title Bar* on page 76
- *Screen captures* on page 99
- *Colour Scale information pane* on page 95

Screen captures

The EK15 provides a built-in screen capture function to create snapshots of the echogram presentation. The EK15 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 EK15 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 submenus. Menu choices shown in dark colours are not available for the current operation or operational mode.

Tip

This chapter only provides the purpose of each function and dialog box. If you wish to learn more about the functionality and the parameters offered, refer to the *Simrad EK15 Reference manual* or the context sensitive online help.

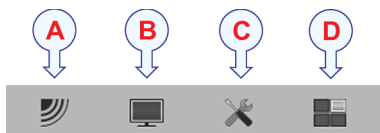
Topics

- *About menus and buttons* on page 102
- *Main menu* on page 104
- *Operation menu* on page 105
- *Display menu* on page 106
- *Setup menu* on page 107
- *Active menu* on page 108

About menus and buttons

The selection of operational parameters on the EK15 is done using a tree structure with a main menu, a set of submenus, and several menu buttons. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

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



Below the main menu, dedicated buttons are used to open the submenus. 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. Click the **Menu** button on the **Title Bar** to hide the menu. Click one more time to retrieve it.



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

You can also place the menu on the left side of the EK15 presentation by clicking **Menu on the right side** in the **Display Options** dialog box.

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.



Tip

For detailed information about every function, button and dialog box, refer to the *EK15 Reference manual* or to the context sensitive on-line help.

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.

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

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 value, or right to increase it.
- 4 Release the mouse button when the requested value is shown.



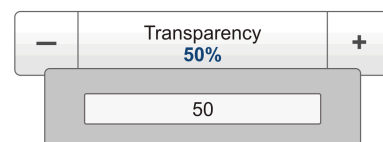
How to select a numerical parameter by means of the scroll wheel

- 1 Place the cursor on the middle of the button.
- 2 Spin the scroll wheel in either direction to increase or decrease the 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 Type the numerical value into the text field.
If the numerical value exceeds the permitted range for the parameter, the frame in the text field will be red.
You will then not be able to keep that value.
- 3 Press the **Enter** key.



How to select a parameter using a submenu

- 1 Click the middle section of the button to open a submenu, then click the requested command, option or button.

The chosen value is applied, and the submenu is automatically closed.

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



How to select parameters using a dialog box

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

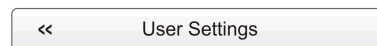


Main menu

The following functions and parameters are available from the **Main** menu.

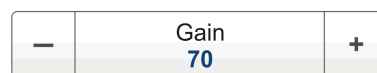
1 User Settings

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

4 Gain

The purpose of the **Gain** function is to adjust the echo level in the echogram presentations.

Submenus

The bottom of the **Main** menu holds the icons for the submenus. Click on one of these icons to open the requested submenu.

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.



Tip

For detailed information about every function, button and dialog box, refer to the *EK15 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.

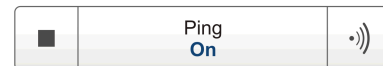
1 Operation

The purpose of the **Operation** function is to control the operational mode of the EK15. You can set it to *Normal*, *Replay* or *Inactive*.



2 Ping

The purpose of the **Ping** function is to enable or disable the EK15 audio transmissions into the water ("pinging").



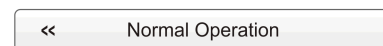
3 Ping Mode

The **Ping Mode** function is used to control how often the EK15 shall transmit its energy into the water. For normal use, choose *Maximum*. This will allow the EK15 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 box 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 echogram information, and save this on the Processor Unit's hard disk. The raw data files can later be copied or moved to other recordable media, or to another computer on the network.

Tip

For detailed information about every function, button and dialog box, refer to the *EK15 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 box is to control the presentation colours used by the EK15.

<< Colour Setup

2 Units

The purpose of the **Units** dialog box is to control the units of measurements used by the EK15.

<< Units

3 Transparency

The purpose of the **Transparency** function is to adjust how much you are able to see through the information panes.

— Transparency 50% +

4 Language

The purpose of the **Language** function is to select the language to be used on the menus and elsewhere in the graphical user interface.

— Language English +

5 Layout

The purpose of the **Layout** dialog box 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.

<< Layout

6 Display Options

The purpose of the **Display Options** dialog box 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.

<< Display Options

7 About

The **About** dialog box allows you to see the current EK15 software version.

<< About

Tip

For detailed information about every function, button and dialog box, refer to the *EK15 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 box is to set up the EK15 to operate alone, or as a master or slave in a synchronized system. Synchronization is required in order to avoid interference if the EK15 is used simultaneously with other hydroacoustic instruments within the same frequency range.

<< Synchronization

2 Annotations

The purpose of the **Annotations** dialog box is to allow you to enter comments and annotations into the echograms.

<< Calculation Interval

<< Annotations

<< Navigation

<< Ethernet Output

<< Depth Output

3 Calculation Interval

The **Calculation Interval** dialog box allows you to define the time, number of pings, or part of the echogram view used to calculate the biomass and the size distribution.

Installation

4 Navigation

The **Navigation** dialog box controls how the EK15 receives information from external peripherals, such as navigation and gyro compass systems.

5 Ethernet Output

The purpose of the **Ethernet Output** dialog box is to define the communication parameters for the EK500 datagram output on the Ethernet port.

6 Depth Output

The **Depth Output** dialog box is used to set up the output of depth data from the EK15 to a dedicated communication port on a specified format.

7 Installation

The **Installation** function opens a small submenu with access to the functions and dialog boxes required to set up the EK15 for operational use.

Tip

For detailed information about every function, button and dialog box, refer to the *EK15 Reference manual* or to the context sensitive on-line help.

Active menu

The **Active** menu is context sensitive. This means that it is empty until you click in a view on the EK15 presentation. The chosen view will appear with a thicker frame to indicate that it is “active”. The **Active** menu will then offer a selection of functions relative to the active view. The **Active** menu will thus change from different views and different presentation formats



While the illustration shown here only provides a limited amount of choices, the list holds all the options.

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

<< Echogram

— TVG School +

— Beam Direction Downwards +

2 TVG

The **TVG** (Time Variable Gain) function allows you to compensate the received data for loss due to geometric spread.

<< Bottom Detector

<< Calibration

3 Beam Direction

The purpose of the **Beam Direction** function is to turn the echogram presentation up-side down. This is typically used if the EK15 transducers are located at the bottom of a fish cage looking upwards.

4 Bottom Detector

The purpose of the **Bottom Detector** dialog box is to define the upper and lower depth limits most likely to be used during the EK15 operation. In this dialog box, you can also modify the setting for **Bottom Backstep** to change the bottom detection relative to the bottom echo.

5 Calibration

The purpose of the **Calibration** dialog box is to accept the reference target and measured target results from the system calibration.

Tip

For detailed information about every function, button and dialog box, refer to the *EK15 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 111
 - *Observation range* on page 111
 - *Bottom echo* on page 112
 - *Wave propagation* on page 113
 - *Biomass* on page 114
 - *Dynamic range and display presentation* on page 114
 - *Bottom slopes* on page 115
- *Parameters* on page 118
 - *TVG gain* on page 118
 - *Output power* on page 120
 - *Pulse duration* on page 122

Concepts

Observe the following descriptions of key concepts.

Topics

- *Observation range* on page 111
- *Bottom echo* on page 112
- *Wave propagation* on page 113
- *Biomass* on page 114
- *Dynamic range and display presentation* on page 114
- *Bottom slopes* on page 115

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

Table 2 Maximum detection depth, split beam transducers (cont'd.)

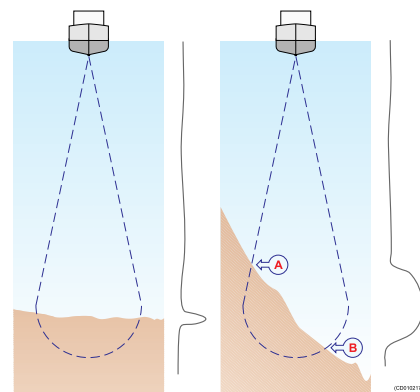
Transducer	Frequency (kHz)	Pulse duration (ms)	Bandwidth (hz)	Tx power (W)	Range fish (m)	Range bottom (m)
ES70-11	70	2,05	1526	800	450	1100
ES120-7C	120	1,02	3026	1000	440	850
ES200-7C	200	1,02	3088	1000	270	550

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.

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 EK15 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 box is 1470 m/s.

The EK15 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.

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

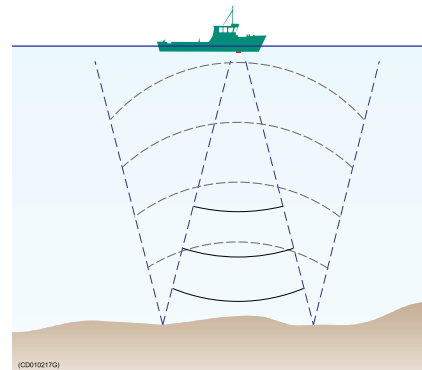
The situation is slightly different when observing the echoes from individual fish. The transmitted wave undergoes square-law spreading when travelling from the surface and down to the fish. The swim bladder of the fish scatters a small fraction of the arriving energy in all directions. Travelling from the fish and back towards the surface the scattered wave undergoes another square-law spreading. The combined effect is referred to as *quad-law* or *40 log TVG* spreading.

In the echo sounder's **Echogram** 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*.

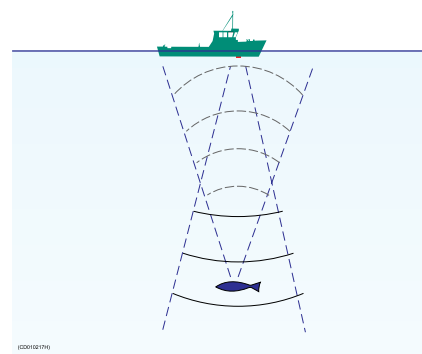
Propagation losses due to absorption are much higher in sea water than in fresh water. Absorption also increases with frequency. At 38 kHz the absorption is 0.5 dB/km in fresh water and 10 dB/km in sea water. At 200 kHz the absorption is 10 dB/km in fresh water and 50 dB/km in salt water. The echo sounder 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.

Wave propagation from a flat bottom



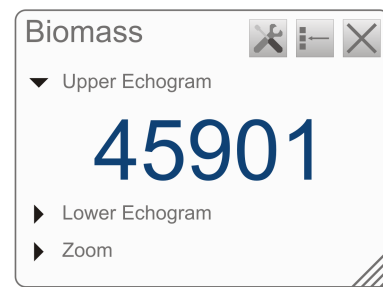
Wave propagation from a fish



Biomass

Provided that you use an EK15 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 EK15 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 EK15, the EK15 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 EK15 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 91
- *Biomass information pane* on page 94

Dynamic range and display presentation

The EK15 echo sounder has a dynamic range of 80 dB.

This means that the sounder can receive both very strong and very weak echoes. Actually, the EK15 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) then represents 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 EK15 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

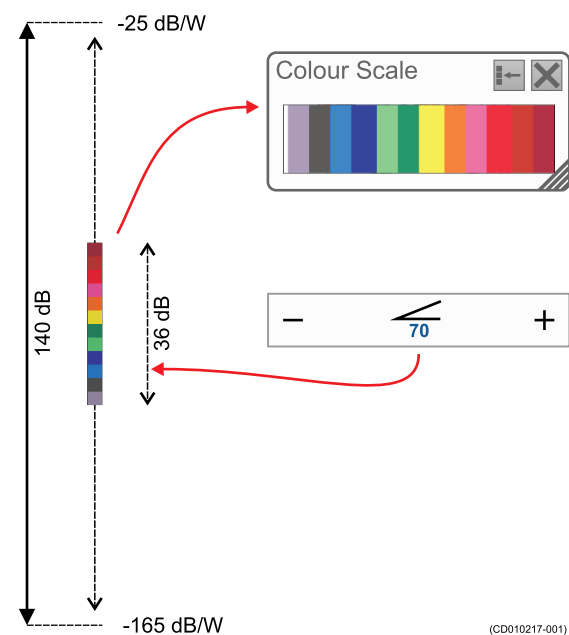
- *Colour Scale information pane* on page 95

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.

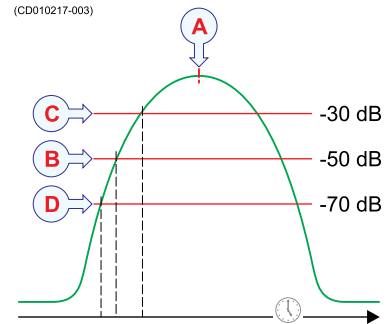
Dynamic range in EK15



Another way to minimize this phenomenon is to open the **Bottom Detector** dialog box, and then change the setting for **Bottom Backstep**. This function can also be put to other use.

- 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 Backstep principle



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 EK15 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:

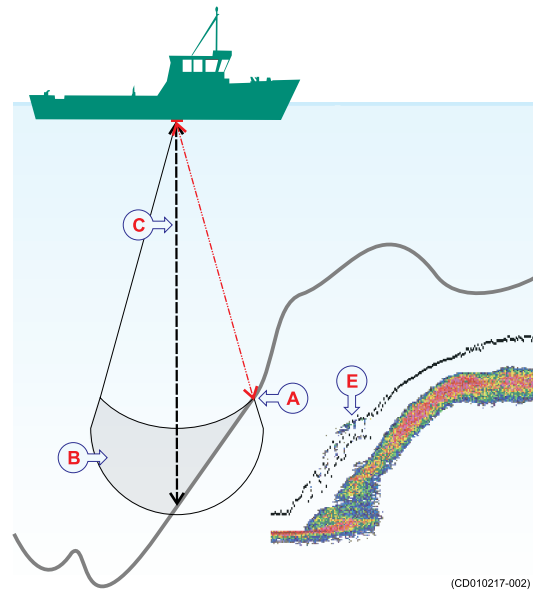
- Reduce the bottom backstep level (make it more negative) to detect the bottom earlier, and thus increase bottom detection “sensitivity”.
 - Increase the bottom backstep level (make it more positive) to detect the bottom later, and thus increase “penetration”.
-

Example 12 Bottom slopes

The edge of the beam (A) hits the bottom first, and starts to give an echo. The bottom detector in the EK15 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 EK15 the phenomenon will cause the bottom line (E) to be distorted.

Bottom slopes

Parameters

Observe the following descriptions of key parameters.

Topics

- *TVG gain* on page 118
- *Output power* on page 120
- *Pulse duration* on page 122

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 EK15 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)

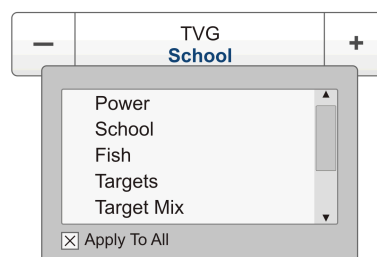
TVG gain is not implemented. This setting is hardly ever used.

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.

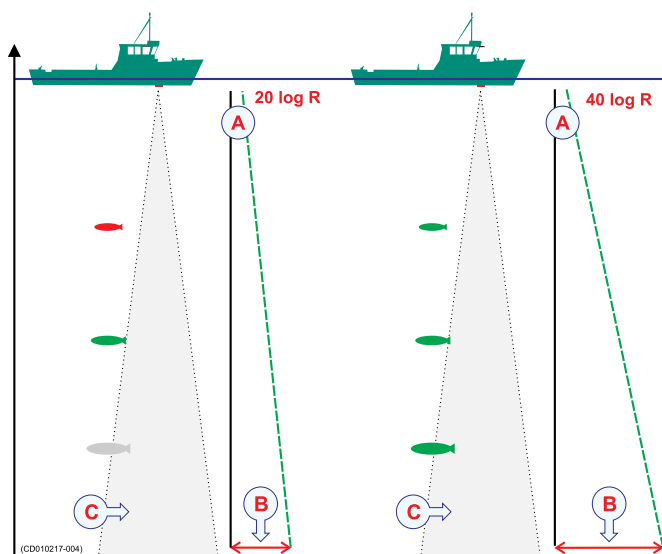
You can adjust the TVG setting using the **Echogram** or **TVG** functions. Both are located on the **Active** menu.

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.

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 unrepairable 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 μPa 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 EK15 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 EK15, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *Choosing passive mode of operation* on page 67
- *Adjusting the pulse duration (length)* on page 68

Pulse duration

The echo sounder's *pulse duration* is a measurement for how long the acoustic pulse lasts.

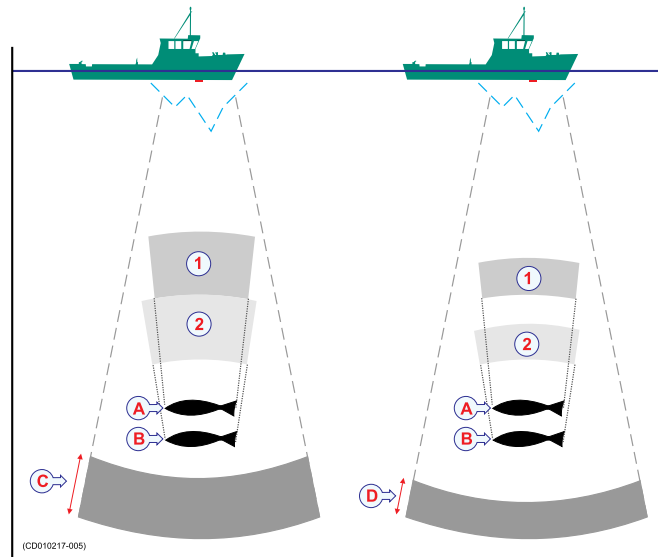
The pulse duration can be adjusted according to the current depth and what kind of fish you are looking for. The deeper you wish to see, the longer pulse duration should be used. Remember that in EK15 echo sounder, the pulse duration and the bandwidth is mutually dependant.

- 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 1 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 two 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 EK15, use the **Normal Operation** function on the **Operation** menu.

Related topics

- *Adjusting the pulse duration (length)* on page 68

Installation

These are the specific procedures required to get you started with the Simrad EK15. 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 126
- *Installation of the EK15 software* on page 126
- *Setting up the EK15 transceiver(s) for the first time* on page 127
- *Installing frequency channels* on page 128
 - *Main procedure* on page 127
 - *Installing frequency channels* on page 128
 - *Starting normal operation* on page 130
- *Changing the IP addresses when more than one transceiver is used* on page 131

Installation of the system units

This procedure explains the basic principles of EK15 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 EK15 is located on the media device provided with the delivery. The documents can also be downloaded from <http://www.simrad.com>.

WARNING

The Simrad EK15 transducer (200–28CM) is not designed for hull mounting!

Procedure

- 1 Install the various hardware units (transceiver(s), computer(s) and transducer(s).
- 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 from each transceiver to the Ethernet switch, and one Ethernet cable from the switch to the computer.
 - d Connect the necessary cables to the display; power and video.
- 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 EK15, and proceed with the next procedure; software installation.

Related topics

- *Installation of the EK15 software* on page 126

Installation of the EK15 software

Purpose

Use this procedure when you wish to install the EK15 software on a computer.

Note

Note that minimum hardware and software requirements must be met by the computer.

Related topics

- *Setting up the EK15 transceiver(s) for the first time* on page 127
- *Powering up the EK15* on page 16

Procedure

- 1 Power up the computer.

- 2 Insert the EK15 software media.
If the EK15 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 flash drive.
- 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 box 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 program.
- 7 If you use **Windows 7** operating system:
 - a Observe that **Windows 7 Firewall** will open a dialog box requesting information about the network.
Select *Public*, and click **Allow access**.
 - b The operating system may also open other dialog boxes to verify that the EK15 software can run on the computer. You must permit this.
- 8 Observe the relevant start-up procedure.

Setting up the EK15 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 127
- *Installing frequency channels* on page 128
- *Starting normal operation* on page 130

Main procedure

This procedure explains how to set up your computer to communicate with the transceiver. You only need to do this once.

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 EK15 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® 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: 157.237.14.60
Subnet mask: 255.255.255.0
 - f Click **OK** to save the settings.
 - g Exit all dialog boxes.
- 2 On the computer, start the EK15 program.
 - 3 Set up the transceiver(s) and transducer(s).
 - 4 Start normal operation.

Related topics

- *Installing frequency channels* on page 128
- *Starting normal operation* on page 130

Installing frequency channels

Purpose

This procedure explains how to install a frequency channel.

Description

Each EK15 transceiver with its transducer and (single) frequency is referred to as a frequency channel.

The upper part of the **Transceiver Installation** dialog box displays a list of frequency channels which either are, or have been, installed on the EK15. For each channel on the list, a **Status** label is provided.

The following status values are available in the **Transceiver Installation** dialog box.

- **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 EK15 system.
- **Lost:** This frequency channel can not be used.
- **Available:** This frequency channel is vacant and ready for use.

Related topics

- *Setup menu* on page 107
- *Checking the transceiver and transducer settings* on page 20

Procedure

- 1 Click the **Setup** icon.

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

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



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



The purpose of the **Transceiver Installation** dialog box is to set up the necessary parameters to connect the EK15 computer to the transceiver(s) and the transducer(s).

- 3 In the **Transceiver Installation** dialog box, click **Browse**.

The EK15 will automatically search the network for transceivers.

- 4 Observe that all the frequency channels are listed in the dialog box.
- 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.

On the EK15, choose transducer **200–28CM** as default. Other transducers can also be used.

- 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 box.

Starting normal operation

Purpose

This procedure explains how to set up the EK15 for normal operation and start ‘pinging’.

Procedure

- 1 Observe the **Main** menu. It is normally located on the right hand side of the EK15 presentation.

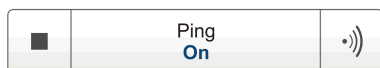
- 2 Click the **Operation** icon.

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



- 3 Click the **Operation** button, and select *Normal*.

- 4 On the **Ping** button, click the symbol on the right hand side to start ‘pinging’.



Installing a frequency channel

Purpose

This procedure explains how to install a frequency channel.

Description

Each EK15 transceiver with its transducer and (single) frequency is referred to as a frequency channel.

The upper part of the **Transceiver Installation** dialog box displays a list of frequency channels which either are, or have been, installed on the EK15. For each channel on the list, a **Status** label is provided.

The following status values are available in the **Transceiver Installation** dialog box.

- **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 EK15 system.
- **Lost:** This frequency channel can not be used.
- **Available:** This frequency channel is vacant and ready for use.

Related topics

- *Setup menu* on page 107
- *Checking the transceiver and transducer settings* on page 20

Procedure

- 1 Click the **Setup** icon.

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

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



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



The purpose of the **Transceiver Installation** dialog box is to set up the necessary parameters to connect the EK15 computer to the transceiver(s) and the transducer(s).

- 3 In the **Transceiver Installation** dialog box, click **Browse**.

The EK15 will automatically search the network for transceivers.

- 4 Observe that all the frequency channels are listed in the dialog box.
- 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.

On the EK15, choose transducer **200–28CM** as default. Other transducers can also be used.

- 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 box.

Changing the IP addresses when more than one transceiver is used

Purpose

This procedure explains how to modify this IP address.

Description

The transceivers are provided by Simrad readily set up with a fixed Ethernet address and an IP address. If your EK15 uses two or more transceivers, these will by default have different Ethernet addresses, but identical IP addresses. In order for your system to work, all transceivers must have unique IP addresses.

If you have bought complete EK15 system that includes a computer and the required number of transceivers, this configuration was done at the factory. However, if you have purchased your own computer, and adds additional transceivers to an existing system, you must do this yourself, or leave it to your dealer.

Related topics

- *Setup menu* on page 107

Procedure

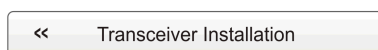
- 1 Click the **Setup** icon.

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

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



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



The purpose of the **Transceiver Installation** dialog box is to set up the necessary parameters to connect the EK15 computer to the transceiver(s) and the transducer(s).

- 3 Observe that the current frequency channels are listed in the dialog box.
- 4 Click once on the frequency channel you wish to modify.
- 5 Observe that the relevant transceiver parameters are shown in the **Transceiver Information** field
- 6 Set the transducer(s) to *None*, and click **Apply**.
- 7 Click **Change IP Address** to open the **IP Address** dialog box.

Note

*If you have two Ethernet cables connected to your computer, you may need to disconnect the Ethernet cable to the ship's network before the **Change IP Address** is available.*

- 8 Enter a new IP address

Tip

Change only the last digit in the IP address.

Tip

If you do not have a computer keyboard connected to your EK15 system, click the **Keyboard** button to open an on-screen keyboard.

- 9 Click **OK** to save the current settings and close the dialog box.
- 10 In the **Transceiver Installation** dialog box, observe that the IP address for the chosen transceiver has changed.

- 11 Install the transducers for the channel with the new IP address.

Note

Make sure that you choose the correct transducer(s)!

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

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