

Quick Start Guide

Simrad SU90

Fish finding sonar





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Fish-finding sonar

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The purpose of this manual is to provide an introduction to safe and efficient use of the Simrad SU90 Fish-finding sonar. This manual is intended for all inexperienced and new users of the Simrad SU90.

Caution _____

You must never start SU90 transmissions (pinging) when the ship is in dry dock. The transducers may be damaged if they transmit in open air.

All end-user manuals provided for operation and installation of your Simrad SU90 can be downloaded from our website.

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

Document information

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Warning

The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. You must be familiar with the contents of the appropriate manuals before attempting to operate or work on the equipment.

Kongsberg Maritime disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Disclaimer

Kongsberg Maritime AS endeavours to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Support information

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

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About this manual

The purpose of this manual is to provide an introduction to safe and efficient use of the Simrad SU90 Fish-finding sonar. The manual does not contain detailed information about functions, dialog boxes and operating parameters.

Target audience

This manual is intended for all inexperienced and new users of the Simrad SU90. We assume that you are familiar with the basic acoustic principles of sound in water. We also expect that you have some experience with sonar operation.

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We want your feedback

We want to improve SU90 continuously. We also want our end-user documentation to be comprehensive and relevant. You can help. Please provide comments, suggestions or constructive criticism to any of our support offices.

Online information

All end-user manuals provided for operation and installation of your Simrad SU90 can be downloaded from our website. Our website also provides information about other Simrad products.

- <https://www.simrad.com/su90>

Simrad SU90

Topics

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Important

The SU90 is an advanced product. It is used with other advanced products. There is important information that you need to know.

Before you turn on the SU90

Before you turn on the SU90, make sure that you have sufficient water depth to lower the transducer!

Caution

You must never turn on the SU90 when the ship is in dry dock. The transducer may be damaged if it transmits in open air.

When the SU90 is not used

When you do not use the SU90, turn off the entire system.

Note

You must never turn off the SU90 by means of the on/off switch on the Processor Unit. You must ALWAYS use the Operating Panel.

When you are docking your vessel

You must never set the SU90 to normal operation when the ship is in dry dock. The transducer may be damaged if it transmits in open air. To prevent inadvertent use of the SU90, pull out the mains plug on the Processor Unit whenever your vessel is in dry dock. Additional precautionary measures should be considered.

If something breaks down

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

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

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

When you want to turn off the SU90

You must never turn off the SU90 by means of the on/off switch on the Processor Unit. When you do not use the SU90, turn it off with the **Power** button on the Operating Panel. If the transducer is lowered when you turn off the SU90, it is automatically retracted to its upper position.

Note

If you turn off the SU90 by means of the on/off switch on the Processor Unit you may damage the software and the interface settings used to communicate with external devices.

Manual operation of the hull unit

In the event of improper operation, the powerful electric motor on the hull unit may cause serious damage to the equipment and/or injury to personnel. Therefore, before you start manual operation, read carefully through the relevant operating procedures.

Note

You must familiarize yourself with the correct handling methods and the relevant safety requirements.

Rules for transducer handling

A transducer must always be handled as a delicate instrument. Incorrect actions may damage the transducer beyond repair. A physical blow to the transducer face may easily damage one or more elements. Observe these transducer handling rules:

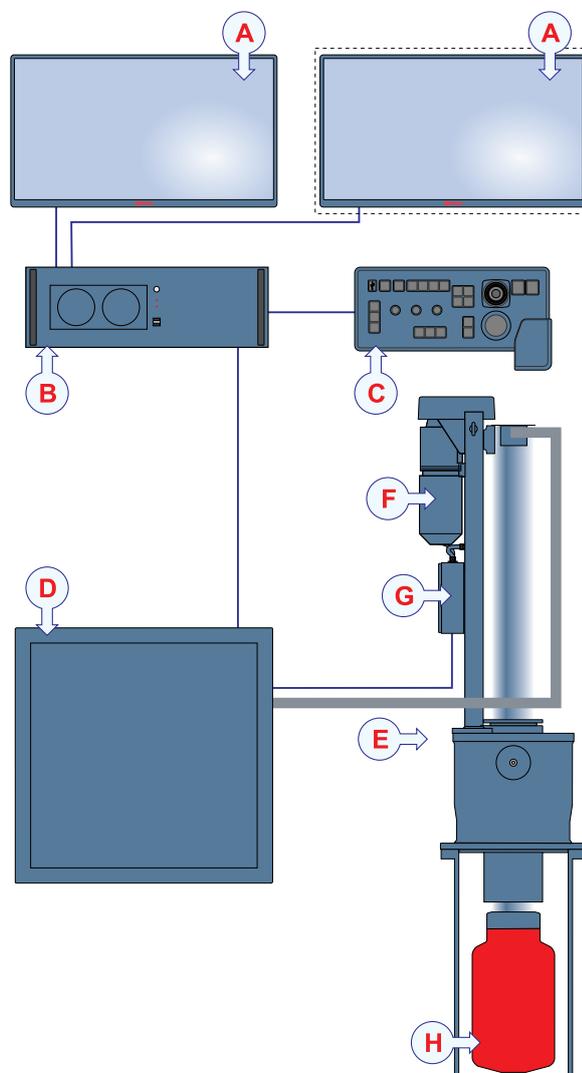
- **Do not** activate the transducer when it is out of the water.
- **Do not** handle the transducer roughly and avoid impacts.
- **Do not** expose the transducer to direct sunlight or excessive heat.
- **Do not** damage the outer protective skin of the transducer.

- **Do not** use high-pressure water, sandblasting, metal tools or strong solvents to clean the transducer.
- **Do not** step on the transducer cables.
- **Do not** damage the transducer cables, and avoid exposure to sharp objects.

System description

The Simrad SU90 is a long range and low frequency fish finding sonar with a 360 degrees coverage. The SU90 is designed for medium and large sized fishing vessels. It was originally developed for purse seiners, but experience has proven that it is also well suitable for trawlers.

- A *Display (The second display is optional.)*
- B *Processor Unit*
- C *Operating Panel*
- D *Transceiver Unit*
- E *Hull Unit*
- F *Hoist motor*
- G *Motor Control Unit*
- H *Transducer*



A choice of hull units is available for the SU90 Fish-finding sonar. The hull units offer different physical properties and lowering depths. The same transducer is used on all hull unit types.

If high performance is your number 1 criteria when choosing a sonar; such as long range, high resolution, narrow beams and high source levels, this is your natural choice. We made no compromises during the design of the SU90. Our goal was simply to make the ultimate high performance fish finding sonar.

The SU90 is designed for fishing vessels of all sizes, both purse seiners and trawlers. The centre operational frequency is 26 kHz, but you can select any operational frequency from 20 to 30 kHz in steps of 1 kHz. The cylindrical multi-element transducer allows the omnidirectional

sonar beams to be tilted electronically from -10 to +60° in 1° steps. This allows you to automatically track schools of fish, and to observe the whole water volume around the vessel. A stabilizing system is included for electronic pitch and roll compensation. Compared to the Simrad SX90, the number of channels is increased by 50% giving the sonar an even better performance in selectivity and range.

General safety rules

Safety is important. The safety precautions must be followed at all times during installation and maintenance work.

WARNING

The SU90 operates on 115 VAC and/or 230 VAC at 50/60 Hz. This voltage is lethal! You must never work alone on high-voltage equipment!

The hull unit is powered by a 3-phase high voltage.

This equipment must be serviced only by qualified personnel familiar with the construction and operation of the SU90, as well as the potential hazards involved. Failure to observe this precaution could result in bodily injury.

- 1 You must always switch off all power before installation or maintenance work on the SU90 system.
Use the main circuit breaker, and label the breaker with a warning sign that informs others that maintenance or installation work is in progress on the system.
- 2 For safety reasons, two persons must always be present during troubleshooting with power ON.
- 3 Read and understand the applicable first aid instructions related to electric shock.
- 4 Whenever maintenance is in progress, it is essential that a first aid kit is available, and that all personnel are familiar with the first aid instructions for electrical shock.
- 5 The various parts of the system may be heavy.
Make sure that the appropriate tools and certified lifting equipment are available. The personnel must be trained in relevant installation and maintenance work.

Support information

If you need technical support for your Simrad SU90 you must contact your local dealer, or one of our support departments. A list of all our offices and dealers is provided on our website. You can also contact our main support office in Norway.

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Getting started

Topics

[Operating Panel description, page 14](#)

[Starting normal operation, page 17](#)

[Basic operating procedures, page 33](#)

Operating Panel description

The SU90 Operating Panel is the most important device for fast and efficient user interface. The Operating Panel offers all necessary control functions for normal operation of the SU90.

The controls provided by the Operating Panel are arranged in logical functional groups. This offers you clear and easy operation with fast access to key functionality. The majority of the SU90 functions can be accessed using the trackball on the Operating Panel and the menu system shown in the SU90 presentation. The Operating Panel allows you to assign certain functions to dedicated buttons and switches.

Tip

A USB socket is provided in the top left corner of the Operating Panel. Use this socket to connect a computer keyboard, a mouse or a USB flash drive.



- A Power:** Press this button to turn the SU90 on and off.
- Before you turn on the SU90, make sure that you have sufficient water depth to lower the transducer!
 - You must never turn on the SU90 when the ship is in dry dock. The transducer may be damaged if it transmits in open air.
 - You must never turn off the SU90 by means of the on/off switch on the Processor Unit. You must ALWAYS use the Operating Panel.
- B Sonar Select:** Since the Operating Panel uses Ethernet to communicate with the Processor Unit, you can use one single panel to control more than one sonar system. To change which sonar to control, press **Sonar Select** on the Operating Panel. If you use your Operating Panel to control more than two sonars, press **Sonar Select** repeatedly to select.
- C User Settings:** Press one of the **User Settings** buttons to apply a predefined user setting. To choose *which* function to apply open the **Operating Panel** page. Under

User Setting Buttons, assign one predefined setting to each button on the Operating Panel. The **Operating Panel** page is located in the **Installation** dialog box.

- D F1 F2 F3:** Press one of the **Fx** buttons to apply a predefined function. To choose *which* function to apply open the **Operating Panel** page. Under **Button Options**, assign one function to each **Fx** button on the Operating Panel.
- Screen Capture:** Press this button to make a copy of the current SU90 presentation. You can choose either a single screen capture or a sequence with multiple screen captures. Open the **Screen Captures** dialog box to select screen capture mode.
- E Joystick:** Press the joystick forward to increase the tilt angle in the active view. Turn the button on the top of the joystick to change the bearing in the active view.
- F Mouse buttons:** These buttons correspond to the two most common buttons on a standard computer mouse. When an instruction tells you to "select" or "left-click", press the left button. When an instruction tells you to "right-click", press the right button.
- G** Use these buttons to lower and hoist the transducer. While the transducer is moving the indicator lamp flashes, and an audible signal is sounded. When the requested position has been reached, the indicator lamp is lit, and the audible signal stops.
- **Up:** Press **Up** to hoist the transducer to its upper position.
 - **Middle:** Press **Middle** to place the transducer in a predefined middle position.
 - **Down:** Press **Down** to lower the transducer to its bottom position.
- H Rotary switches:** Turn a rotary switch to apply a predefined function. To choose *which* function to apply open the **Operating Panel** page. Under **Rotary Switch Options**, assign one function to each rotary switch on the Operating Panel.
- I** Use these buttons to place markers in the current active view.
- **Marker:** Press **Marker** to place a generic marker in the active view. One or more markers can be placed in the view to identify specific echoes. Each marker is shown as a small triangle with or without a short identifying label. It is positioned based on the two known axes in the view as well as the tilt and bearing of the current ping.
 - **Circle Marker:** Press **Circle Marker** to place a circular marker in the active view. The circle is drawn with the same diameter as your purse. By means of the circle you can see the size of the school relative to your purse.
 - **Gear:** Press **Gear** to place a gear symbol in the active view. The gear symbol is provided as a tool to help you plan and shoot the purse seine. The symbol is intended to be used in a structured sequence that starts when you plan to shoot the purse seine.
- J** Press these buttons to start position or target tracking.
- **Position Track:** Use the trackball to control the cursor in the SU90 user interface. A position track permits the SU90 to automatically control the tilt and bearing based on the movements of your vessel. It locks on a position defined by its latitude, longitude and depth. The bearing and tilt settings are automatically adjusted to compensate for the movements of your vessel.

- **Target Track:** A target track permits the SU90 to automatically control the tilt and bearing based on the movements of the chosen target. It locks on the target defined by its position, heading and speed. The bearing and tilt settings are automatically adjusted to follow the movements of the tracked target.

A new tracked object is automatically given priority status. Relevant information about the priority object can be found in the lower left corner of the view. If you change the tilt or bearing settings manually the priority status is lost.

K Trackball: Use the trackball to control the cursor in the SU90 user interface.

Note

The SU90 supports two different operating panels. These are referred to as "Mk1" and "Mk2". In this publication all descriptions and references are related to "Mk2".

Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to *all the views* in the current presentation mode.

Starting normal operation

Topics

- [Turning on the SU90 for normal use, page 17](#)
- [Getting to know the user interface, page 18](#)
- [Getting to know presentation modes and views, page 20](#)
- [Selecting *Normal* mode to start "pinging", page 24](#)
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Turning on the SU90 for normal use

In order to use the SU90, you must first turn it on. To turn on the SU90 use the **Power** button on the Operating Panel. The SU90 program starts automatically when the Processor Unit is turned on.

Caution

You must never start SU90 transmissions (pinging) when the ship is in dry dock. The transducer may be damaged if it transmits in open air.

Procedure

- 1 Make sure that you have sufficient water depth below the keel before you lower the transducer.
- 2 Turn on the display(s).
If required, refer to the instructions provided by the display manufacturer.
- 3 On the Operating Panel, press **Power**, and keep it depressed for a few seconds.
The blue indicator light in the button flashes while the Operating Panel establishes contact with the Processor Unit. When the connection has been made, the blue indicator light is lit permanently.
Wait while the operating system and SU90 program is loaded and started. Both the Processor Unit and the Transceiver Unit are turned on automatically.
- 4 Observe that the **Transceiver On/Off** dialog box opens automatically.



The dialog box offers progress information. You can monitor the progress as the Transceiver Unit is turned on. A blue circle on the hull unit symbol means that your SU90 Processor Unit communicates with the Motor Control Unit.

- 5 Once the program has started, observe that the presentation fills the entire screen.

The program starts up using the same settings as the last time you used it. If these settings are acceptable, continue operation. If you wish to alter any of the settings, see the relevant procedures.

- 6 To lower the transducer, press **Down** on the Operating Panel.

While the transducer is moving the indicator lamp flashes, and an audible signal is sounded. When the requested position has been reached, the indicator lamp is lit, and the audible signal stops.



Alternatively, use the **Hull Unit** function on the top bar to lower the transducer.

- 7 At the bottom of the **Main** menu, observe that the **Operation** icon is flashing.

The icon is flashing to indicate that even if the SU90 is turned on, "pinging" is disabled. The SU90 is in *Normal* mode, but **TX Power** is set to *Off* to prevent transmissions. This is for safety reasons.

- 8 Set **Tx Power** to *Maximum* (or any other power rating) to start pinging.

Related topics

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[Turning off the SU90, page 32](#)

Getting to know the user interface

The SU90 consists of specific visual elements that work together. The visual elements provide you with the echo information you need, they help you to control the functionality needed to understand this information, and finally, they allow you to control the operational parameters. By default, the SU90 presentation covers the entire screen.

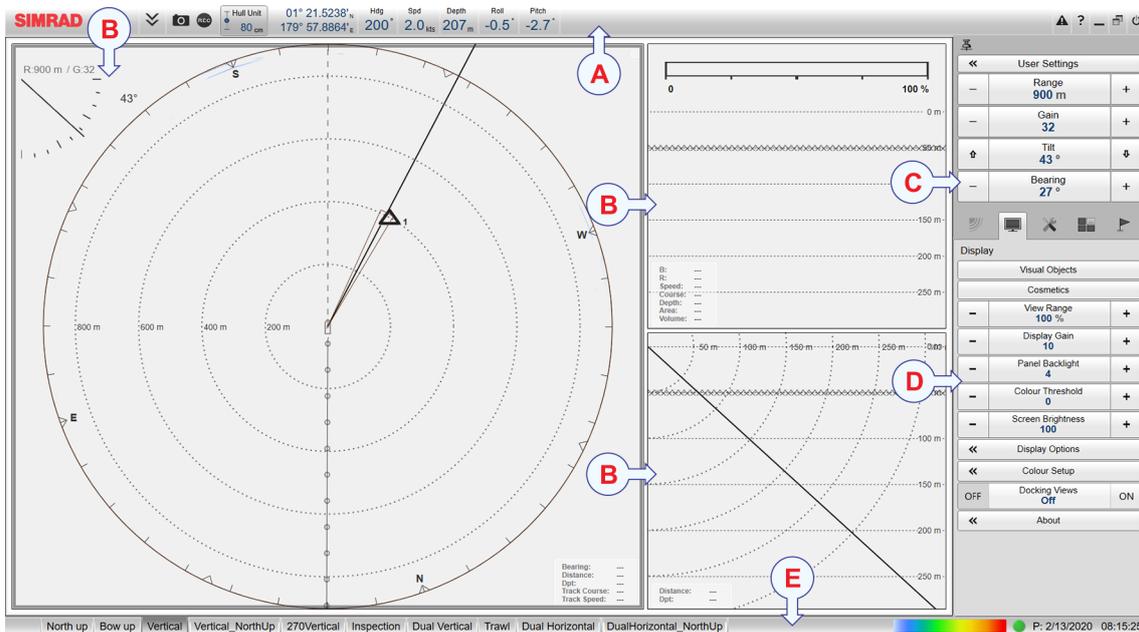
Context

All echoes offered by the SU90 are shown in rectangular *views*. Each view has a specific purpose, and it can be set up with independent operational settings. Combinations of these views are organized in *presentation modes*, which you can select on the bottom bar. You can change the physical size of any view.

Tip

*The **Docking Views** function provided by the SU90 allows you to rearrange the physical positions of the views, and change their sizes.*

A comprehensive menu system allows access to all SU90 functionality. The menu system is by default located on the right side of the SU90 presentation.



- A Top bar
- B Sonar views
- C Menu system
- D Secondary menus
- E Bottom bar

Procedure

- 1 Move the cursor to the top bar, and investigate the functions provided.
The SU90 top bar is located at the top of the display presentation and stretches from the far left to the far right. The top bar gives you fast access to key functionality and navigational information. It provides buttons for hiding and showing the menu, making screen captures, opening the **Messages** dialog box, and opening context-sensitive help.
- 2 Move the cursor to the menu system on the right side of the SU90 presentation.
The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the SU90. Below the **Main** menu, a set of dedicated icons are used to open the secondary menus. Select the icon one more time to close the menu.
- 3 Move the cursor to the bottom of the SU90 presentation.
The bottom bar is located at the bottom of the SU90 presentation and stretches from the far left to the far right. It allows you to choose presentation mode (view combinations). It also shows you the colour scale you are using, as well as current time and date. You can further monitor the operational status of the transceiver.

- 4 Move the cursor to the views in the main SU90 presentation.

The various presentation modes selected on the bottom bar gives you different view configurations. By default, the views are arranged automatically in the SU90 presentation. You can change the physical size of any view. Click on the view border, hold the button depressed, then drag the border to create a smaller or larger rectangle. Note that the size of the other views are changed accordingly!

- 5 Click inside one of the views.

Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Observe that the border lines of the active view are drawn with a thicker line.

Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to *all the views* in the current presentation mode.

Related topics

[Starting normal operation, page 17](#)

Getting to know presentation modes and views

The SU90 presentation offers several views. Different combinations of views are organized in presentation modes.

Context

The SU90 presents the echo data in different views. All information from each ping is shown in all the views simultaneously. Each view uses its individual transmit frequency, and you set up the different views with different operating parameters. The behaviour of the echoes in each view is controlled by your course and speed combined with the movements of the target(s).

The following views are available:

- *Horizontal*
- *Vertical*
- *270 Vertical*
- *Catch*
- *Echogram*
- *Plane*

Tip

*With the various beams provided by the SU90, it may be difficult to understand the concept. How do these beams "behave" in the water? By means of a graphic presentation, the **Beam Visualization** dialog box attempts to give you a better understanding of how the acoustic beams are transmitted into the water. Open the **Beam Visualization** dialog box from the **Setup** menu.*

Procedure

- 1 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *Horizontal* view.

The view presents the 360 degrees area around your vessel in bird's eye view. The current bearing is shown with a continuous line pointing out from the vessel position. You can change the angle by means of the **Bearing** function on the **Main** menu. You can also select the bearing line and drag it sideways.

The bow marker is shown as a dotted line drawn from the bow of the vessel symbol. The line reflects your vessel's current heading. The bow marker can be enabled or disabled on the **Visual Objects** menu.

The distance from the vessel symbol in the centre of the circle to the outer ring corresponds to the currently selected range.

- The current settings for range, gain and tilt are shown in the upper left corner of the view. When you change the tilt a dotted line presents the requested tilt while the solid line presents the actual tilt. You can change the tilt angle by means of the **Tilt** function on the **Main** menu. You can also click on the tilt line in a *Vertical* view and drag it up and down.
- The position (bearing and distance) and depth of the cursor location is shown in the lower right corner of the view. The depth is calculated from the current tilt and the distance from the vessel.
- The course and speed of the latest marker is found in the lower right corner of the view. The values are calculated based on the last two markers you placed and the time between each placement.
- Relevant information about a priority object can be found in the lower left corner of the view.

The **Cosmetics** menu controls which graphical elements that are shown.

- 2 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *Vertical* view.

The view shows you a "vertical slice" of the echo data. The slice is made at the current bearing. The area covered by the vertical beam is shown as a triangle in the *Horizontal* view. You can change the bearing on the **Main** menu. You can also select the bearing line in a *Horizontal* view and drag it sideways.

The upper horizontal line in the view represents the water surface.

- Horizontal dotted lines show the depth intervals. Use **Depth Dividers** on the **Cosmetics** menu to toggle these lines *On* or *Off*.
- The selected range is divided into identical distances. These are shown as dotted circles. They are referred to as *range rings*.
- The distance and depth of the cursor location is shown in the lower right corner of the view.

The current tilt is shown with a solid line. You can change the tilt angle by means of the **Tilt** function on the **Main** menu. You can also click on the tilt line and drag it up and down.

A line of X's in the vertical views shows the bottom of the purse seine. The depth is defined for the fishing gear you have chosen. Under **Fishing Gear**, select **Fishing Gear Setup** to open the dialog box. For the selected purse, select a depth value. Use **Purse Depth** on the **Cosmetics** menu to toggle this line *On* or *Off*.

The **Cosmetics** menu controls which graphical elements that are shown.

- 3 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *270 Vertical* view.

The *270 Vertical* view is designed for purse seining. The view combines a horizontal "bow up" presentation with a vertical slice. The vertical half slice is displayed in the lower left corner for when the net is set out on the starboard side. If the net is set on the port side, the vertical slice is displayed in the lower right hand corner. The area covered by the vertical beam is shown as a triangle in the *Horizontal* view.

This view makes it easy to keep contact with the school. You can determine its size distribution, and monitor the position the school relative to the bottom.

The throw side is defined for the fishing gear you have chosen. Under **Fishing Gear**, select **Fishing Gear Setup** to open the dialog box. For the selected purse, set throw side to *Port* or *Starboard*.

- 4 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *Catch* view.

Use the information in the *Catch* view to monitor the progress of the purse seine operation. The view does not offer any echo data.

The progress bar at the top of the *Catch* view shows you the amount of net that has been spent. The sequence starts when you shoot the net. You must then press **Gear** on the operating panel or select **Place Gear Symbol** on the shortcut menu.

The estimated depth of the purse seine is shown under the progress bar. The depth is calculated from the sink rate you have defined for the fishing gear. Under **Fishing Gear**, select **Fishing Gear Setup** to open the dialog box. For the selected purse, set the sink rate.

- Horizontal dotted lines show the depth intervals. Use **Depth Dividers** on the **Cosmetics** menu to toggle these lines *On* or *Off*.
- Relevant information about a priority object can be found in the lower left corner of the view.

A line of X's in the vertical views shows the bottom of the purse seine. The depth is defined for the fishing gear you have chosen. Under **Fishing Gear**, select **Fishing Gear Setup** to open the dialog box. For the selected purse, select a depth value. Use **Purse Depth** on the **Cosmetics** menu to toggle this line *On* or *Off*.

If you have connected a compatible catch monitoring system to your SU90, information from these sensors are shown in the *Catch* view.

- 5 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *Echogram* view.

The *Echogram* view provides echo data from a horizontal beam in a common echogram presentation. The echo data is taken from the current bearing and tilt. The beam used to provide data is identified in the top left corner of the view. Horizontal dotted lines show the depth intervals.

- You can change the bearing on the **Main** menu. You can also select the bearing line in a *Horizontal* view and drag it sideways.
- You can change the tilt angle by means of the **Tilt** function on the **Main** menu. You can also click on the tilt line in a *Vertical* view and drag it up and down.

Left-click in the *Echogram* view to open the tooltip. The tooltip provides the cursor location in the echogram (slant range, true range and depth) as well as the current pulse duration and time.

The **Horizontal Scroll** function controls how fast the echo presentation shall move from right towards left in the *Echogram* view. The "speed" is controlled by adjusting the number of pixels used to present each ping. A higher speed reduces the resolution.

- 6 At the bottom of the SU90 presentation, select a suitable presentation mode, and activate the *Plane* view.

The *Plane* view presents the echo data in a horizontal sector ("fan"). The sector direction can be changed in both vertical and horizontal directions. The tilt is drawn in the *Vertical* and *Horizontal* views as two dotted lines. The same dotted lines are shown in the *Horizontal* view as a dedicated bearing line to visualize the direction of the plane beam.

- You can change the bearing on the **Main** menu. You can also click on the dedicated dotted bearing line in a *Horizontal* view and drag it.
- You can change the tilt angle by means of the **Tilt** function on the **Main** menu.

Horizontal Tx Sector defines the opening angle of the sector. It can be set to 360°.

- The selected range is divided into identical distances.
- The distance and depth of the cursor location is shown in the lower right corner of the view.
- The current settings for range, gain and tilt are show in the lower left corner of the view.

Tip

To fully understand how the beams behave in this view, use the **Beam Visualization** dialog box.

Related topics

[Starting normal operation, page 17](#)

Selecting *Normal* mode to start "pinging"

In order to transmit ("ping") you must set the SU90 to *Normal* operating mode. This is the default mode when the SU90 is turned on.

Context

The **Operation** function controls the operating mode of the SU90. You can set it to *Normal*, *Replay* or *Inactive*. *Normal* mode allows the SU90 to transmit ("ping") through the water, and to receive the echoes.

Caution

You must never start SU90 transmissions (pinging) when the ship is in dry dock. The transducer may be damaged if it transmits in open air.

Once started, the SU90 transmissions are controlled by the **Transmission Mode** and **TX Power** functions.

Procedure

- 1 Open the **Operation** menu.
- 2 Set **Operation** to *Normal*.



The **Operation** function controls the operating mode of the SU90. *Normal* mode allows the SU90 to transmit ("ping") through the water, and to receive the echoes.

- 3 Set **Transmission Mode** to *Maximum*.



The **Transmission Mode** function enables or disables the SU90 transmissions into the water. If you choose *Maximum*, the SU90 will transmit (ping) continuously and as often as possible. This gives you the maximum refresh rate.

The ping rate is normally limited by the maximum range settings. It will also be dependant on hardware issues. This may be, for example, how fast your Processor Unit can handle the information from each ping, how fast your system

communicates with external peripherals, or how long time the system uses to save data.

- 4 Set Tx Power to *Maximum*.



Result

The SU90 is now transmitting acoustic pulses ("pinging") into the water.

Related topics

[Starting normal operation, page 17](#)

Adjusting the radius of the search area

Some echoes are close, others are further away. It is often necessary to adjust the radius of the search area. On the SU90, this is referred to as *range*.

Context

The **Range** setting defines how "far" you wish the SU90 to detect echoes. In other words, you specify the horizontal or vertical distance from the vessel to the outer edge of the search area.

Note

The range value selected and shown is by default only used by the active view.

Even though you can choose a large range value, that does not mean that you can detect your targets on the same range. The range value only defines the range that is shown in the views. Actual target detection will always depend on the operational environment, such as water temperature, salinity, interference and layers in the water column.

The selected range is divided into identical distances. These are shown as dotted circles. They are referred to as *range rings*.

Tip

An adjustable range ring can be added to the Horizontal and Vertical views. This ring is referred to as the variable range ring.

Procedure

- 1 Click in the view you want to activate.

The active view is identified with a thicker border. Unless you use the **Apply to all** function, all changes you make will only be applied to this view.

- 2 Turn the relevant rotary switch to make the adjustment.

Tip

*The Operating Panel is fitted with three rotary switches. The switches are identified with numbers. Each switch can be assigned a function related to range, gain or bearing. Investigate the functionality provided on the **Operating Panel** page. This page is located in the **Installation** dialog box.*

Optionally:

- 3 Observe the **Main** menu.

Its default location is on the right side of the SU90 presentation.

- 4 Select **Range**.



- 5 Make the necessary adjustment.

Select [+] or [-] to choose the requested setting.

or:

Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

or:

Select the middle of the button to open it. If you have a keyboard connected to the SU90, you can type the requested value.

or:

Select the middle of the button to open it. Select a value from the options provided.

- 6 Open the button and select **Apply to all** if you wish to use the chosen setting in all the views in the current presentation mode.

Related topics

[Starting normal operation, page 17](#)

Adjusting the echo sensitivity

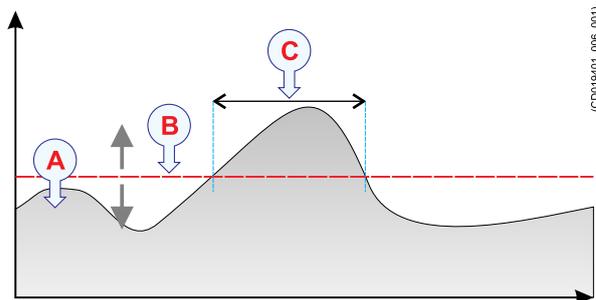
Some echoes are weak while others are stronger. To compensate for this it is often necessary to adjust the sensitivity of the SU90. This adjustment is commonly referred to as *gain*.

Context

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 SU90 presentations will also show this noise. Too much gain may therefore "distort" the presentation.

Comparing the gain function with the volume control on your car radio is not very accurate. In fact, the gain in the SU90 is constant. The **Gain** function is used to adjust the sensitivity. This done by controlling the minimum level of detection. When you *increase* the gain level (more positive number) , you reduce the minimum level, and thus *increase* the sensitivity.



The echo strength (A) changes with time. The minimum level of detection (B) is adjusted up or down with the **Gain** function. Increasing the **Gain** with a more positive number reduces the minimum level, and this increases the sensitivity. Only echoes over the minimum level are shown in the echogram (C).

Do not confuse this **Gain** setting with the **TVG** (Time Varied Gain) setting.

Tip _____

During normal operating conditions we recommend that you keep the gain between 15 and 30. If you need to adjust the gain "from scratch" disable **AGC** (Automatic Gain Control) and **RCG** (Reverberation Controlled Gain) to see the immediate effect of the gain adjustments. While you adjust the gain you may find it useful to have a known target (for example an island) as reference.

Procedure

- 1 Click in the view you want to activate.

The active view is identified with a thicker border. Unless you use the **Apply to all** function, all changes you make will only be applied to this view.

- 2 Turn the relevant rotary switch to make the adjustment.

Tip _____

The **Operating Panel** is fitted with three rotary switches. The switches are identified with numbers. Each switch can be assigned a function related to range, gain or bearing. Investigate the functionality provided on the **Operating Panel** page. This page is located in the **Installation** dialog box.

Optionally:

- 3 Observe the **Main** menu.

Its default location is on the right side of the SU90 presentation.

- 4 Select **Gain**.



- 5 Make the necessary adjustment.

Select [+] or [-] to choose the requested setting.

or:

Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

or:

Select the middle of the button to open it. If you have a keyboard connected to the SU90, you can type the requested value.

- 6 Open the button and select **Apply to all** if you wish to use the chosen setting in all the views in the current presentation mode.

Related topics

[Starting normal operation, page 17](#)

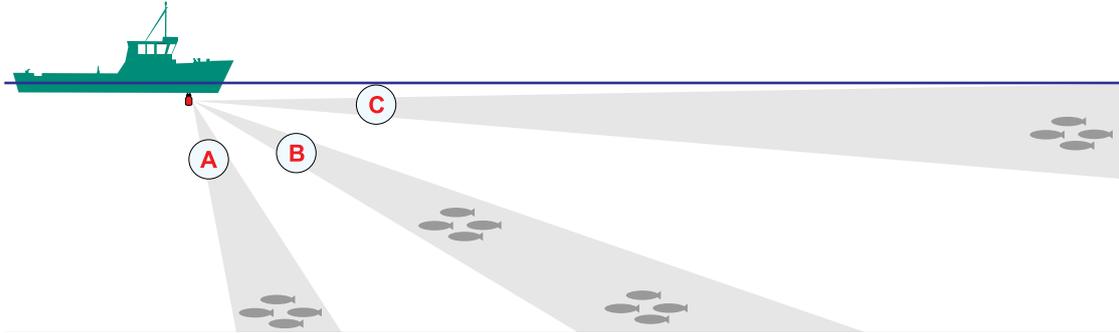
Changing the vertical angle of the sonar beams

In order to detect fish or schools in the water column you may need to change the angle of the sonar beams. The sonar beams can be tilted electronically from -10 to +60° in 1° steps.

Context

The current tilt is shown with a solid line in the *Vertical* view. In the *Horizontal* view, the current settings for range, gain and tilt are shown in the top left corner of the view.

At 0° tilt the sonar beam is transmitted parallel with the sea surface, while -60° tilt will direct it towards the bottom.



The challenge is to find a tilt that prevents the fish echoes to be "buried" in reverberation and bottom echoes.

- If you use a high tilt value (A) the fish are easily disguised by bottom echoes. A strong RCG (Reverberation Controlled Gain) setting will remove the bottom echoes. As the distance from the bottom to the fish increases, the fish echoes become clearer. However, this assumes that the fish echoes are considerably stronger than the bottom echoes.
- If you use a very small tilt (C) you are not bothered by bottom echoes. However, if the sea surface is gusty you will see echoes from the waves. These echoes are normally rather weak, and they hardly move in relation to your vessel.
- By means of a medium tilt angle (B) you are able to pick up scattered fish or schools if these are located at some distance above the bottom. The upper school in the illustration appears on the sonar picture before the bottom echo, while the lower school will easily be disguised by the bottom echoes. Once again you can activate the RCG function to improve the reading.

Tip

*With the various beams provided by the SU90, it may be difficult to understand the concept. How do these beams "behave" in the water? By means of a graphic presentation, the **Beam Visualization** dialog box attempts to give you a better understanding of how the acoustic beams are transmitted into the water. Open the **Beam Visualization** dialog box from the **Setup** menu.*

Procedure

- 1 Click in any view to make it active.

The active view is identified with a thicker border. Unless you use the **Apply to all** function, all changes you make will only be applied to this view.

- 2 In a *Vertical* view, click on the tilt line, keep the mouse button depressed, and drag the line up or down.

Optionally:

- 3 Observe the **Main** menu.

Its default location is on the right side of the SU90 presentation.

- 4 Select **Tilt**.



- 5 Make the necessary adjustment.

Select either side of the button to choose a value. Keep the mouse button depressed to change the value faster.

or:

Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

or:

Select the middle of the button to open it. If you have a keyboard connected to the SU90, you can type the requested value.

- 6 Open the button and select **Apply to all** if you wish to use the chosen setting in all the views in the current presentation mode.

Related topics

[Starting normal operation, page 17](#)

Adjusting the horizontal direction of the sonar beam

The *Horizontal* view in the SU90 presentation covers the entire xxx sector. For the other views you must define the horizontal direction of the beam.

Context

In the *Horizontal* view the current bearing is shown with a continuous line pointing out from the vessel position. The area covered by the vertical beam is shown as a triangle in the *Horizontal* view.

Note

The choice you make is by default only applied to the currently selected (active) view. The active view is identified with a thicker border.

A new tracked object is automatically given priority status. The priority is identified with a "P". The bearing and tilt settings are automatically adjusted to follow the movements of the tracked target. The bearing line is automatically locked on the object to reflect its bearing.

Procedure

- 1 Click in the view you want to activate.

The active view is identified with a thicker border. Unless you use the **Apply to all** function, all changes you make will only be applied to this view.

- 2 Turn the relevant rotary switch to make the adjustment.

Tip

*The Operating Panel is fitted with three rotary switches. The switches are identified with numbers. Each switch can be assigned a function related to range, gain or bearing. Investigate the functionality provided on the **Operating Panel** page. This page is located in the **Installation** dialog box.*

Optionally:

- 3 In a *Horizontal* view, select the bearing line and drag it sideways.

Optionally:

- 4 Observe the **Main** menu.

Its default location is on the right side of the SU90 presentation.

- 5 Select **Bearing**.



- 6 Make the necessary adjustment.

Select [+] or [-] to choose the requested setting.

or:

Place the cursor on the button. Press and hold the left mouse button. Move the cursor horizontally over the button. Release the mouse button when requested value is shown.

or:

Select the middle of the button to open it. If you have a keyboard connected to the SU90, you can type the requested value.

- 7 Open the button and select **Apply to all** if you wish to use the chosen setting in all the views in the current presentation mode.

Related topics

[Starting normal operation, page 17](#)

Turning off the SU90

Select **Power Off** on the top bar to turn off the SU90. You can also use the **Power** button on the Operating Panel. You must never turn off the SU90 by means of the on/off switch on the Processor Unit.

Context

When you do not use the SU90, turn off the display and the Processor Unit.

Procedure

- 1 Select **Power Off** on the top bar.

In the **Power Off** dialog box, select **Power off** or **Exit to Operating System**.

- **Power Off** turns off the Processor Unit and the Transceiver Unit.
- **Exit to Operation System** closes the SU90 program, and turns off the Transceiver Unit.
- Both functions will also retract the transducer.



or:

- 2 On the Operating Panel, press **Power**, and keep it depressed for a few seconds.

In the **Power Off** dialog box, select **Power off** or **Exit to Operating System**.

- 3 Wait while the SU90 program closes and the Transceiver Unit is turned off.



- 4 Turn off the display.

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

Related topics

[Starting normal operation, page 17](#)

Basic operating procedures

Topics

[Selecting the language displayed in the menus and dialog boxes, page 33](#)

[Selecting operating frequency for minimum noise, page 34](#)

[Hiding the menu system when you do not need it, page 35](#)

[Saving single or sequential screen captures, page 35](#)

[Saving the current user settings, page 37](#)

[Defining the ping \(transmission\) modes, page 38](#)

Selecting the language displayed in the menus and dialog boxes

You may prefer to use the SU90 with a user interface in your own language. The **Language** function allows you to select the language to be used in the SU90 presentations, menus and dialog boxes.

Context

With a few exceptions, the chosen language will also be used for all other text on the SU90. The SU90 help may not be available for the language you choose. If your language is not supported, the English help is provided.

Procedure

- 1 Open the **Setup** menu.
- 2 Select the middle of the **Language** button to open the list of available options.



- 3 Select the language you wish to use.

Result

All the texts in the user interface are changed to the selected language.

The context sensitive on-line help may also be available in your language. To change the language in the on-line help, you may need to restart the SU90.

Related topics

[Basic operating procedures, page 33](#)

Selecting operating frequency for minimum noise

The **Frequency** function is used to control the centre frequency of the acoustic transmissions (pings). The centre frequency can be changed from 20 to 30 kHz in steps of 1 kHz. All types of noise matter when you wish to find the best operating frequency.

Context

A lower frequency gives you a better detection range because the attenuation loss is smaller. A higher frequency gives you better range resolution. A higher frequency also gives you narrower beams and a "sharper" image".

Noise from internal and external sources have an impact on the choice of operating frequency. One specific frequency may perform better than the others on your vessel. To measure the noise level, observe the value presented on the **Noise** page in the **BITE** dialog box.

We recommend that you do this test twice. First, do the test with all other hydroacoustic systems (echo sounders, ADCP, sonars) turned off. Second, do the test with normal operating conditions. This allows you to see how the other hydroacoustic systems affect the SU90 operation.

Procedure

- 1 On the **Main** menu, select **User Settings**.
 - a Select **SU90 Factory Default**.
 - b Select **Activate Selected Setting**.
 - c Select **OK** to apply your changes and close the **User Settings** dialog box.
- 2 On the **Main** menu, set **Range** to *1000 m*.
- 3 Open the **Operation** menu. Set **Tx Power** to *Off*.
- 4 Open the **Active** menu. Set **Pulse Type** to *CW Medium*.
- 5 Open the **Setup** menu.
- 6 Select **BITE** to open the dialog box.



- a Select **Noise** to open the page.
- b Select **Start Noise Measurements**.
- c On the **Active** menu, change the **Frequency** setting while observing the noise value.
- d Note frequencies with high noise levels, and try to avoid using them.

Tip

The factory default settings include operating frequency. If you apply these settings remember to make the appropriate changes afterwards.

Related topics

[Basic operating procedures, page 33](#)

Hiding the menu system when you do not need it

Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the SU90 presentation. This gives you more space for echo information.

Context

The menu system is by default located on the right side of the SU90 presentation. The menus are organized in a tree structure with a main menu, a set of secondary menus, and several menu buttons.

Tip

*The **Menu on the right side** option is provided in the **Display Options** dialog box. By deselecting this function, the entire menu system is placed permanently on the left side of the SU90 presentation.*

Procedure

- 1 To hide the menu, select **Menu** on the top bar.



When the menu is hidden, it is temporarily shown on the left or right side of the SU90 presentation if you move the cursor to that position.

- 2 To retrieve the menu, select **Menu** one more time.

Related topics

[Basic operating procedures, page 33](#)

Saving single or sequential screen captures

While using the SU90 you may wish to make a screen capture to save an instantaneous copy of the current presentation. Each screen capture you make is saved in .jpg format on the Processor Unit hard disk.

Context

You can choose either a single screen capture or a sequence with multiple screen captures. Each screen capture you make is saved in .jpg format on the Processor Unit hard disk. The file name reflects the current date and time.

Screen Capture on the top bar allows you to make a copy of the current SU90 presentation. You can also use the **Screen Capture** button on the Operating Panel.



Procedure

Choosing screen capture mode:

- 1 Open the **Setup** menu.
- 2 Select **Screen Captures**.
 - a Select screen capture mode.
 - **Single**: In *Single* mode one screen capture is every time you select **Screen Capture** on the top bar.
 - **Sequence**: In *Sequence* mode a new screen capture is created for every ping.
 - b Select **Close** to save the chosen settings and close the dialog box.

Saving a single screen capture:

- 3 Observe **Screen Capture** on the top bar.
- 4 Select **Screen Capture** to make a copy of the current SU90 presentation.
Every time you do this a new image file is created.
You can also use the **Screen Capture** button on the Operating Panel.



Saving a sequence of screen captures:

- 5 Select **Screen Capture** on the top bar to start the sequence.
- 6 Select **Screen Capture** one more time to stop the sequence.

Related topics

[Basic operating procedures, page 33](#)

Saving the current user settings

When you have spent some time working with the SU90, you are probably using specific settings that you know are efficient for your purpose. It is a good idea to save these settings.

Context

The **User Settings** dialog box is used to store your favourite SU90 settings. These settings can be related to different operations, environmental conditions or basic personal preferences. You can use different settings to create as many user profiles as you like, and give them any name. All the settings you have chosen using functions and dialog boxes in the SU90 user interface are saved.

Procedure

- 1 Observe the **Main** menu.

Its default location is on the right side of the SU90 presentation.

- 2 Select **User Settings**.



- 3 Select **Save Current Setting**.

A small dialog opens to accept the name of the new setting.

- 4 Type a name for the user setting.

Note

*If you do not have a computer keyboard connected to your SU90 system, select the **Keyboard** button to open an on-screen keyboard.*

- 5 Select **OK** to save the chosen name.
- 6 Observe that the name you have chosen appears on the **Saved Settings** list.
- 7 Select **OK** to close the dialog box.

Related topics

[Basic operating procedures, page 33](#)

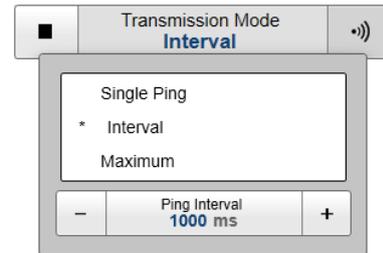
Defining the ping (transmission) modes

You can easily control how often the SU90 shall transmit acoustic energy (a ping) into the water. You can disable the transmission altogether, set it to operate as fast as possible, or select a time interval.

Context

Once pinging is *On*, use **Transmission Mode** to choose *how often* the SU90 shall transmit (ping). Use it to control the *behaviour* of the transmissions (pinging).

- *Single Ping*: The SU90 transmits (pings) only when you select the symbol on the right side of the button.
- *Interval*: The SU90 transmits (pings) with a fixed time interval. **Ping Interval** permits you to choose the time (in milliseconds) between each transmission (ping).
- *Maximum*: The SU90 transmits (pings) as frequent as possible.



Procedure

- 1 Open the **Operation** menu.
- 2 Set **Operation** to *Normal*.
- 3 Set **Transmission Mode** to *Maximum*.



- Select the symbol on the right side of the button to start pinging.
- Select the symbol on the left side the button to stop pinging.
- Select the middle of the button to open it.

If you choose *Maximum*, the SU90 will transmit (ping) continuously and as often as possible. This gives you the maximum refresh rate. The time between each ping (the *ping rate*) depends mainly on the current range. In some systems, a low performance Processor Unit and/or a slow hard disk may reduce the ping rate. How fast your Processor Unit communicates with external peripherals may also have an effect on the ping rate.

or:

- 4 Set **Transmission Mode** to *Interval*.

Specify the interval between each ping.

Select either side of the button to choose a value. Select the middle of the button to open it. If you have a keyboard connected to the SU90, you can type the requested value.

You can also change the value by selecting - and holding - the middle of the button, and move the cursor sideways. Drag the cursor sideways to increase or decrease the value. Release the mouse button when requested value is shown.

or:

5 Set **Transmission Mode** to *Single Ping*.

The SU90 transmits (pings) only when you select the symbol on the right side of the button.

Related topics

[Basic operating procedures, page 33](#)

Menu system

Topics

[About the menus and menu buttons, page 41](#)

[Using the "smart" menu buttons, page 41](#)

[Main menu, page 42](#)

[Operation menu, page 44](#)

[Display menu, page 46](#)

[Setup menu, page 48](#)

[Active menu, page 50](#)

[Objects menu, page 53](#)

[Visual Objects menu, page 57](#)

[Cosmetics menu, page 60](#)

[Shortcut menus, page 62](#)

About the menus and menu buttons

To select operational parameters on the SU90, use the menu system. The menus are organized in a tree structure with a main menu, a set of secondary menus, and several menu buttons. The menus are organized in a tree structure with a main menu and a secondary menu. Some of the menu buttons open dialog boxes or submenus to offer additional choices.

Description

The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the SU90. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.

Tip

*Unless you need to make frequent changes to the operating parameters, you may want to hide the menu from the SU90 presentation. This gives you more space for echo information. To hide the menu, select **Menu** on the top bar. To retrieve the menu, select **Menu** one more time. When the menu is hidden, it is temporarily shown on the left or right side of the SU90 presentation if you move the cursor to that position.*



Using the “smart” menu buttons

Each menu provided by the SU90 contains several menu buttons. Each button shows the purpose of the button. Some of them also display the current setting.

Depending on the properties of each individual button, several methods can be used to change settings.

- Select the *left* side of the button to *decrease* the numerical value. Select the *right* side of the button to *increase* the numerical value.
- Press and hold the left mouse button. Move the cursor *right* to increase the value. Move the cursor *left* to decrease the value.
- Spin the scroll wheel in either direction to increase or decrease the numerical value.
- Type a numerical value. (You can only type a new value if a computer keyboard is connected to your SU90 Processor Unit.)
- Select the button to open the button menu. Choose the required setting.
- Select the button to open the dialog box.

Main menu

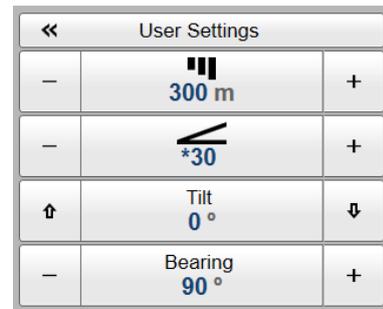
The **Main** menu is located at the top of the menu structure. It offers the most common functions for efficient use of the SU90. Unless you hide the entire menu system, the **Main** menu is visible at all times, even if you close the secondary menus.

How to open

By default, the **Main** menu is open. It is placed on the right side of the SU90 presentation.

Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions. For detailed information about each function and dialog box, refer to the SU90 *Reference manual* or the context sensitive on-line help.



Tip

If you do not need to use the menu system, you can hide it. This allows more space for the SU90 presentation.



Use **Menu** on the top bar to hide or show the menu.

When the menu system is hidden, it appears temporarily on the left or right hand side of the screen if you move the cursor to that position.

Below the **Main** menu you find the icons for opening (and closing) the secondary menus. Select an icon to open the relevant menu, and reselect the icon to close the menu.

- **User Settings**

The **User Settings** dialog box allows you to save the current user settings (your current selection of operational parameters), and to retrieve factory or previously saved user settings.

- **Range**

The **Range** function allows you to specify the maximum distance from the transducer to the outer edge of the sonar beam. The range value shown and selected is by default only applied to the currently selected view.

- **Gain**

The purpose of the **Gain** function is to adjust the echo level in the SU90 presentations. By adjusting the gain you can control how much amplification the SU90 applies to the received echoes. The setting is by default only applied to currently selected echogram. It is identified with a thick border.

- **Tilt**

The **Tilt** function allows you to control the vertical angle of the sonar beams.

- **Bearing**

The *Horizontal* view in the SU90 presentation covers the entire xxx sector For the other views you must define the horizontal direction of the beam. Use **Bearing** to adjust the horizontal angle referenced to the vessel heading.

Operation menu

The **Operation** menu allows you to control the operating mode, the recording functionality, and how the SU90 transmits (ping) into the water.

How to open

Select the **Operation** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Note

*Immediately after you have turned on the SU90, the **Operation** icon is flashing. The icon is flashing to indicate that even if the SU90 is turned on, "pinging" is disabled. When the SU90 is turned on, **Tx Power** is by default set to **Off**. This is a safety precautions to prevent inadvertent transmissions when the vessel is in dry dock.*

Operation		
Operation Normal		
■	Transmission Mode Maximum	·)))
■	Record Off	●
-	Tx Power -20dB	+
OFF	Audio On	ON

Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions. For detailed information about each function and dialog box, refer to the SU90 *Reference manual* or the context sensitive on-line help.

- **Operation**

The **Operation** function controls the operating mode of the SU90. You can set it to *Normal*, *Replay* or *Inactive*.

- **Transmission Mode**

Transmission Mode allows you to control how often the SU90 shall transmit acoustic energy (ping) into the water.

- **Record**

Record allows you to record echo data. You can save the data to the Processor Unit hard disk, or onto an external storage device. The data files can be played back on the SU90. You can keep the recorded files for future reference, or for training purposes.

- **Tx Power**

Use **Tx Power** to increase or decrease the output power. The output power is selected from predefined steps.

- **Audio**

Select **Audio** to turn the audio output on or off. The audio information is generated based on the echoes retrieved from the bearing defined by the bearing line. If you need to adjust the volume use the controls on the audio equipment you use.

Display menu

The **Display** menu provides basic functions related to the screen behaviour and presentation of SU90 data.

How to open

Select the **Display** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions. For detailed information about each function and dialog box, refer to the SU90 *Reference manual* or the context sensitive on-line help.

The choices in the this menu depends on which view in the SU90 presentation that is currently "active". The menu may therefore change from one view to another. The screen capture may not show you all the menu choices.

- **Visual Objects**

Visual Objects is an "on/off" button used to open the **Visual Objects** menu. The **Visual Objects** menu controls which graphical elements that are shown in the different views. These graphic elements include markers, vectors and targets that are tracked. The majority of the functions are "on/off" buttons to enable or disable these graphic elements in the SU90 views.

[Visual Objects menu, page 57](#)

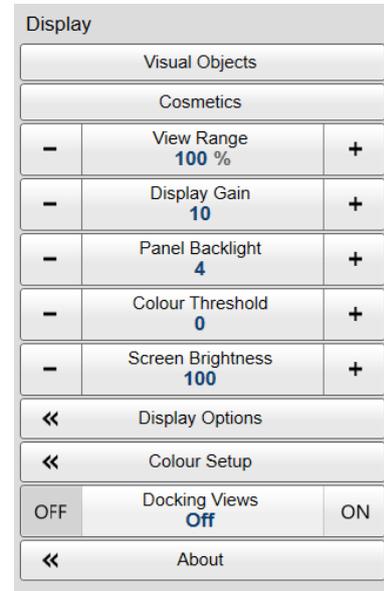
- **Cosmetics**

Use the functions on the **Cosmetics** menu to turn "cosmetic" elements in the SU90 presentation on or off. The majority of the functions are on/off buttons to enable or disable "cosmetic" elements in the SU90 presentation. This function is not available in all the views.

[Cosmetics menu, page 60](#)

- **View Range**

Use **View Range** to expand the range shown in the relevant views to any percentage of the original **Range** value. This function can be used if you wish to move your ship symbol to the bottom of the SU90 view. You can then expand the range without adding zoom.



- **Display Gain**

Display Gain increases or decreases the strength of the echo presentation.

- **Panel Backlight**

The buttons on the Operating Panel have built-in backlight to improve visibility on a dark bridge. Use **Panel Backlight** to control the intensity of the lights.

- **Colour Threshold**

The **Colour Threshold** function allows you to reduce or increase the number of colours. This will provide a filtering effect that removes the weakest echoes.

- **Screen Brightness**

The intensity of the light given off by the SU90 presentation can be adjusted. You can use this function to increase or decrease the light from the screen to match the ambient light.

- **Display Options**

The top bar gives you fast access to key functionality and navigational information. It provides buttons to hide or show the menu, to monitor data recording, to open the **Messages** dialog box, and to open the context sensitive on-line help. Which navigation elements to see on the top bar is selected in the **Display Options** dialog box. It controls the location of the menu. You can also select which tooltips to appear when you move the cursor over the echo information.

- **Colour Setup**

The **Colour Setup** dialog box controls the presentation colours used by the SU90. This includes the palette ("skin"), the number of colours in use, and the colour scale when no TVG has been selected for the presentation

- **Docking Views**

Each operating mode is presented with a set of views. These are placed at different positions with different sizes. With the **Docking Views** function you can move and re-size the views in the SU90 presentation.

- **About**

Every SU90 software release is uniquely identified. The **About** dialog box identifies the current SU90 software version with its release date. The version described in this Quick Start Guide is 3.1.4.

Setup menu

The **Setup** menu provides basic functions related to the SU90 installation parameters and its communication with peripheral systems.

How to open

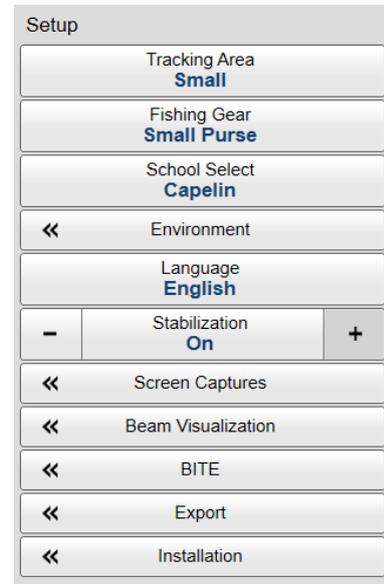
Select the **Setup** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions. For detailed information about each function and dialog box, refer to the SU90 *Reference manual* or the context sensitive on-line help.



- **Tracking Area**

Use **Tracking Area** to define the size of the area that you want to detect moving objects in. An invisible area - the tracking area - is created as an acquisition area. In order for the SU90 to find and lock on the intended target, it needs to be kept within this tracking area. If the intended target falls outside the area, the tracking can not be started.

- **Fishing Gear**

By defining the type of fishing gear you are using, the SU90 may provide more accurate visual presentations. Use the **Fishing Gear Setup** dialog box to change the fishing gear properties to match your own equipment.

- **School Select**

During normal operation, the detection and estimation of fish schools depends on the specie and the density of the school. **School Select** offers a selection of species. Based on your choice the SU90 will adjust its operating parameters to achieve optimal performance.

Select **School Select Setup** to adjust the density for a given specie, or to create you own school parameters.

- **Environment**

Environmental parameters such as salinity, sound speed and water temperature all play an important part to present accurate echo data. Use the **Environment** parameters to define these values. Depending on the current sea and weather conditions, you may need to change these values frequently.

- **Language**

You may prefer to use the SU90 with a user interface in your own language. A selection of languages is provided. The **Language** function allows you to select the language to be used in the SU90 presentations, menus and dialog boxes.

- **Stabilization**

The SU90 is provided with a built-in electronic stabilization of the sonar beams. In case of a faulty motion reference unit this functionality can be turned *Off*.

- **Screen Captures**

While using the SU90 you may wish to make a screen capture to save an instantaneous copy of the current presentation. You can choose either a single screen capture or a sequence with multiple screen captures.

- **Beam Visualization**

With the various beams provided by the SU90, it may be difficult to understand the concept. How do these beams "behave" in the water? The beam visualization feature simulates how the acoustic beams cover the seabed and the water column.

- **BITE (Built-In Test Equipment)**

The SU90 is a computerized Fish-finding sonar. There are hardly any analogue circuitry, and the possibility of traditional troubleshooting is limited. In order to rectify this, a built-in software application is available to offer test and maintenance functionality. The **BITE** (Built-In Test Equipment) dialog box controls the test and diagnose program that checks the performance of the SU90.

- **Export**

The **Export** dialog box allows you to export user settings, configuration files, message logs and information related to the hardware and software troubleshooting.

- **Installation**

Prior to use, the SU90 must be set up to communicate with the relevant peripherals. This includes the transducer. The **Installation** dialog box collects all relevant peripherals on individual pages, and allows you to set up the basic parameters related to installation and operation. In most cases, you only need to do this once.

Active menu

The **Active** menu offers parameters related to current views and data presentations shown by the SU90.

How to open

Select the **Active** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions. For detailed information about each function and dialog box, refer to the SU90 *Reference manual* or the context sensitive on-line help.

The choices in the this menu depends on which view in the SU90 presentation that is currently "active". The menu may therefore change from one view to another. The name of the currently active view is identified at the top of the menu. The screen capture may not show you all the menu choices.

Active	Horizontal	
-	TVG *20 Log R	+
-	Ping-Ping Filter *Medium	+
-	Pulse Type *Auto	+
-	Bandwidth 0.5 kHz	+
-	Frequency 25 kHz	+
-	Horizontal Tx Sector *Omni	+
-	Vertical Tx Sector Wide	+
-	Range Projection Slant	+
-	AGC Off	+
-	RCG 4	+
-	Bottom Filter Threshold Off	+
-	Noise Filter *Medium	+
-	Vertical Reference *Water Column	+

Note

*Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to all the views in the current presentation mode.*

- **TVG (Time Variable Gain)**

When an acoustic pulse is sent through the water, it will gradually lose its energy. The greater the distance between the transducer and the target(s), the greater the loss of energy. **TVG** (Time Variable Gain) compensates for the loss of acoustic energy due to geometric spread and absorption.

- **Ping-Ping Filter**

The **Ping-Ping Filter** analyses the historical information from previous consecutive pings in order to remove unwanted noise and false echoes from the SU90 presentation.

- **Pulse Type**

The **Pulse Type** function allows you to select the "shape" of the transmitted pulses ("pings"). Different shapes have different qualities. Which pulse type to use depends on the current environmental conditions, your range to the target(s) and the type and speed of the target(s) you are observing.

- **Bandwidth**

The **Bandwidth** function allows you to select the frequency range in the Hyperbolic Frequency Modulated (HFM) transmissions.

- **Frequency**

The **Frequency** function allows you set the centre frequency for the Hyperbolic Frequency Modulated (HFM) and Linear Frequency Modulated (LFM) transmissions (pings), and the operating frequency for the Continuous Wave (CW) pings.

- **Horizontal TX Sector**

The SU90 transmits in a swath with maximum horizontal opening angle xxx. By means of the **Horizontal Tx Sector** function, you can change this opening angle to 360°. The function is only available in the *Horizontal*, *Plane* and *Inspection* views.

- **Vertical TX Sector**

The SU90 transmits in a swath with maximum vertical opening angle xxx. By means of the **Vertical Tx Sector** function, you can change this opening angle to 4.9 to 7°. The function is only available in the *Vertical* and *Navigation* views.

- **Range Projection**

The distance to a target located anywhere in the water column can be measured in two ways. This can either be the horizontal distance to the target (*True*), or along the tilt angle (*Slant*). The **Range Projection** function defines how this distance is measured.

- **AGC (Automatic Gain Control)**

The **AGC** (Automatic Gain Control) function runs an automatic analysis of the echo strength.

- **RCG (Reverberation Controlled Gain)**

The **RCG** (Reverberation Controlled Gain) function removes unwanted reverberation from the bottom and or from the sea surface. This enhances the visibility of schools. It may however also remove scattered fish from the presentation.

- **Bottom Filter Threshold**

The SU90 provides a bottom filter to reduce the sometimes powerful echo from the seabed. This filter is useful if you try to find fish close to the bottom. Select a **Bottom Filter Threshold** value to control the "strength" of the filter. A higher numerical increases the filter efficiency and reduces the bottom echo accordingly.

- **Noise Filter**

The **Noise Filter** removes unwanted acoustic noise from the SU90 presentation. It reduces the interference from other acoustic systems (sonars and echo sounders), as well as the noise from the propellers.

- **Horizontal Scroll**

The **Horizontal Scroll** function controls how fast the echo presentation shall move from right towards left in the *Echogram* view. The "speed" is controlled by adjusting the number of pixels used to present each ping. A higher speed reduces the resolution.

- **Vertical Reference**

The function is only available in the *Vertical* view, as well as the vertical *Navigation* view.

Objects menu

The **Objects** menu is - in spite of its name and location - not a menu at all. This "menu" opens a small view to monitor and control the objects you have defined in the SU90 presentation. Each object is identified with a visual marker.

How to open

Select the **Objects** icon.



The icon is located under the **Main** menu. Select the icon one more time to close the menu.

Description

Once an echo has been provided with a marker in the SU90 presentation it is regarded as an *object*. The **Objects** menu provides a list of all current objects. This includes all types of objects including those classified as targets.

In this context, the phrase *marker* is used to identify a visual symbol placed in the SU90 presentation. By placing a marker on the echo it is regarded as an *object* that you can act upon. If relevant, you can further classify the object as a *target*.

The phrase *target* is used to identify an echo in the SU90 presentation that you wish to act upon. The echo may be from a material item, a shallow, reef or rock, or from fish, fish schools or mammals. You must decide which echoes that shall be classified as targets, and whether you shall start position or target tracking.

If you have placed markers on several echoes to make them objects, you can select one of these and give it *priority* status. The bearing line in the relevant SU90 views will automatically be locked on the object with this priority to reflect its bearing. Only one single object can be given priority status. The priority is identified with a "P".

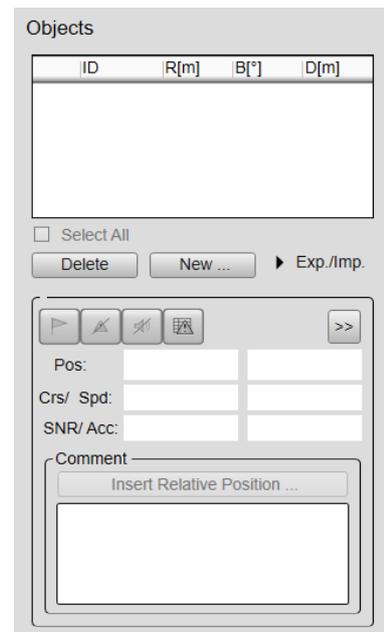
Objects list

Once an echo has been provided with a marker in the SU90 presentation it is regarded as an *object*. The table at the top of the **Objects** menu shows you all the objects that are currently identified with markers. Each marked object is listed with the following information:

- **ID:** This is the unique identification of each object marker.

Each marker is numbered sequentially.

Objects with allocated markers are identified with an "M" in the **Objects** menu. Objects that are subjected to target tracking are identified with a "T". One



marker can be given priority status to identify the object as the most important target or position. The priority is identified with a "P".

- **R:** This is the range (in metres) from the vessel and to the object identified with the marker.
- **T:** This is the true bearing to the object.
- **D:** This is the object's depth (in metres) relative to the sea surface.

Each marker is specified by its geographical position (latitude and longitude) and its depth. Additional information is provided for objects that are subjected to target tracking.

- Select the check box on the left side of any object to mark it for deletion, or to save it.
- Select the object *line* to activate the control buttons, and to retrieve information about the object.

Select All

Click **Select All** to select all the markers in the list

Delete

Select **Delete** to delete all the markers you have selected in the objects list. Each marker is removed both from the list and from the SU90 presentation.

New

Select **New** to add a new marker manually. The **New Marker** dialog box opens to accept position and depth information.

Export/Import

Once you have defined any number of objects, these can be saved to a file on the Processor Unit hard disk. If necessary, you can later retrieve the file for reuse. The file format is XML. The file is located in the following folder:

c:\ProgramData\Simrad\SU90\Markers

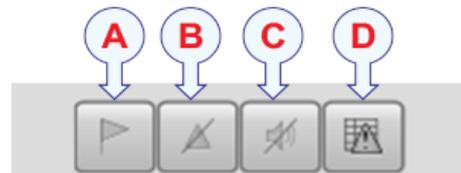
- **To External:** This function is not implemented on the SU90.
- **To File:** Select **To File** to save the currently selected objects to a file. The file name is built automatically using date and time information.
- **From File:** Select **From File** to retrieve the previously saved objects. The **Import Marker** dialog box offers a list to choose from.

Control buttons

In the object list, select the object *line* to activate the control buttons for that particular object.

A Priority

One marker can be given priority status to identify the object as the most important target or position. Select **Priority** to give the currently selected object a priority status. If another object has this priority, the status is transferred to the new object. The priority is identified with a "P".



B Disable Alarm

When you are tracking a moving target, certain target behaviour may trigger an alarm. Select **Disable Alarm** to disable alarms for the currently selected tracked target.

C Suppress Alarm Audio

When you are tracking a moving target, and the target behaviour triggers an alarm, you will hear an audio signal. Select **Suppress Alarm Audio** to disable the audio.

D Alarm History

All alarms are presented under the **Alarms** tab in the **Messages** dialog box. Select **Alarm History** to open the **Messages** dialog box.

Object information

In the object list, select the object *line* to retrieve object information about that particular object. Some information is only available for an object that is subjected to target tracking.

- **Position**

Two fields present the geographical position of the currently selected object.

- **Course/Speed**

In the list of objects, select an object on which you have started target tracking. Two fields present the course and speed of the tracked target.

- **SNR (Signal to Noise ratio)/Acceleration**

In the list of objects, select an object on which you have started target tracking. One field presents the acceleration of the tracked target. The Signal to Noise ratio (SNR) gives the strength of the tracked target relative the noise floor defined by the reference cell in the CFAR filter.

Comment

A text field at the bottom of the **Objects** menu allows you to type comments. You can only do this if you have computer keyboard connected to your Processor Unit.

Insert Relative Position

Select **Insert Relative Position** to insert object information into the comment field. The information is inserted as a text string that contains the following information:

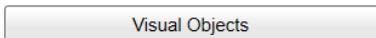
- UTC time
- Relative bearing
- Range to own ship
- Depth

Visual Objects menu

The **Visual Objects** menu controls which graphical elements that are shown in the different views. These graphic elements include markers, vectors and targets that are tracked. The majority of the functions are "on/off" buttons to enable or disable these graphic elements in the SU90 views.

How to open

Select **Visual Objects** to open the menu.



Visual Objects is located on the **Display** menu. The function is not available for the *Inspection* views.



Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions.

The choices in the this menu depends on which view in the SU90 presentation that is currently "active". The menu may therefore change from one view to another. The screen capture may not show you all the menu choices.

Note

*Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to all the views in the current presentation mode.*

- **Position Object Sizes**

The **Place Marker** function allows you to create a marker at the current position of the cursor. Each marker is shown as a small triangle with or without a short identifying label. When you start target or position tracking, a marker is used to identify the object. With this function you can increase or decrease the size of the markers.

Use this function to find the object sizes that fit your preferences. This may for example depend on your physical distance from the screen. The choice you make is saved with the user settings.

- **Bottom Profile**

For each ping transmitted for a vertical view, the SU90 offers bottom detection functionality. This is an "on/off" switch. Set **Bottom Profile** to *On* to see a bottom contour in the current view. Select **Apply to all** if you wish to use the chosen setting in all the vertical views in the SU90 presentation.

- **Minute Markers**

In order to maintain a visual presentation of your vessel's previous movements, you can draw these with a line. This line is drawn after the vessel symbol in the SU90 presentation, and visualizes your past movements. The **Minute Markers** function adds markers to the line to indicate the travelled distance for each minute. The minute markers are shown as small circles on the vessel's track line.

To draw the line use the settings on the **Track Line** page. The **Track Line** page is located in the **Display Options** dialog box. The **Display Options** dialog box is located on the **Display** menu.

- **Markers**

The **Place Marker** function allows you to create a marker at the current position of the cursor. Each marker is shown as a small triangle with or without a short identifying label. Use this function to control if and how the marker symbols are shown in the currently active view. Select **Apply to all** if you wish to use the chosen setting in all the views in the SU90 presentation.

- **Tracks**

When you start target or position tracking, a marker is used to identify the object. Each marker is shown as a small circle with or without a short identifying text. Use this function to control if and how the tracking markers are shown in the currently active view. Select **Apply to all** if you wish to use the chosen setting in all the views in the SU90 presentation.

- **Minute Markers Tracks**

When you start a target track, a dedicated marker is used to identify the object you are tracking. When enabled, **Track History** draws a line after each tracked target. The line identifies the previous positions of the target. This function adds markers to the track history. These indicate the target's travelled distance for each minute.

- **Track History**

When you start a target track, a dedicated marker is used to identify the object you are tracking. Each marker is shown as a small circle with or without a short identifying text. In most cases, the target will move and continuously change its position relative to your own vessel. When enabled, **Track History** draws a line after each tracked target. The line identifies the previous positions of the target. This allows you to manually predict its current heading.

- **Speed Vector**

Speed Vector shows you the predicted course and speed of the tracked target. The prediction is based on target's current movements. The estimate is limited to one minute.

The information is provided with a line indicating the target's course. The length of the line reflects its speed.

- **Bow Marker**

This function displays a dotted line drawn from the bow of the vessel symbol. The line reflects your vessel's current heading.

Do not confuse this line with the bearing line.

- **Current Vector**

This function shows you the speed and direction of the water current under your vessel. The function draws a line starting under the vessel symbol. The direction of the line indicates the direction of the water current. The length of the line reflects its speed.

For this function to work, a sea current meter must be connected to the SU90. The use of an ADCP (Acoustic Doppler Current Profiler) is recommended.

Cosmetics menu

Use the functions on the **Cosmetics** menu to turn "cosmetic" elements in the SU90 presentation on or off.

How to open

Select **Cosmetics** to open the menu.



Cosmetics is located on the **Display** menu. The function is not available for the *Inspection* views.



Description

The majority of the choices provided by this menu are self-explanatory. Only specific functions of particular interest are explained with brief descriptions.

The choices in the this menu depends on which view in the SU90 presentation that is currently "active". The menu may therefore change from one view to another. The screen capture may not show you all the menu choices.

Note

*Before you can change the settings related to a view, you must click inside the view to activate it. The changes you make are by default only valid for the active view. Several of the functions offer **Apply to All**. If you select **Apply to All** your setting is applied to all the views in the current presentation mode.*

- **Range Rings**

This function enables range rings to be shown on the SU90 presentation. Range rings are a set of concentric circles labelled by distance from the vessel position. The range rings are shown as dotted lines. Each ring has a range read-out on the left hand side. Use this function to toggle the range rings *On* or *Off*.

- **Variable Range Ring**

An adjustable range ring can be added to the *Horizontal* and *Vertical* views. The ring is shown as a dotted circle with its centre on the vessel symbol. The current range is shown next to the circle. To change the range, left-click on the circle and drag to requested diameter. You can use **VRR Range** to manually define a range. The variable range ring can be used for any type of distance measurement relative to the vessel.

- **VRR Range (Variable Range Ring Range)**

You can use **VRR Range** to manually define a range for the variable range ring.

- **Compass Cards**

Activate **Compass Cards** to place evenly spaced compass markers on the outer range ring in horizontal views. The compass markers rotate based in the inputs from a navigation sensor. An update takes place when the vessel heading changes more than 1 degree.

- **Depth Dividers**

Depth dividers are horizontal dotted lines used to indicate depth. You can only add these lines to vertical views. Use this function to toggle the depth divider lines *On* or *Off*.

- **Coverage Plot**

When you operate with sector transmissions, the area covered by the sonar beams is limited by the chosen transmit sector angle. To make it easier to recognize the area limits, dedicated border lines may be added to the presentation. These lines are used to outline the sector. Use this function to toggle the coverage plot lines *On* or *Off*.

- **Purse Depth**

A line of X's in the vertical views shows the bottom of the purse seine. The depth is defined for the fishing gear you have chosen. Use **Purse Depth** on the **Cosmetics** menu to toggle this line *On* or *Off*.

Shortcut menus

Shortcut menus provide additional functionality for SU90 operation.

How to open

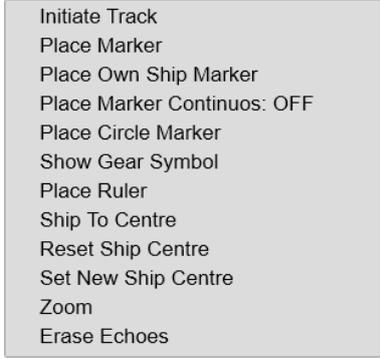
Right-click in the view to open the shortcut menu. The *Inspection* views do not provide shortcut menus.

Description

To make a choice, right-click in the view and select the relevant option on the shortcut menu.

Note

The functionality provided by the shortcut menus differ from one view to another depending on the view properties. The Inspection views do not provide shortcut menus. Functions from all shortcut menus are listed. The screen capture is provided as an example.



- Initiate Track
- Place Marker
- Place Own Ship Marker
- Place Marker Continuous: OFF
- Place Circle Marker
- Show Gear Symbol
- Place Ruler
- Ship To Centre
- Reset Ship Centre
- Set New Ship Centre
- Zoom
- Erase Echoes

In this context, the phrase *marker* is used to identify a visual symbol placed in the SU90 presentation. By placing a marker on the echo it is regarded as an *object* that you can act upon. If relevant, you can further classify the object as a *target*.

The phrase *target* is used to identify an echo in the SU90 presentation that you wish to act upon. The echo may be from a material item, a shallow, reef or rock, or from fish, fish schools or mammals. You must decide which echoes that shall be classified as targets, and whether you shall start target tracking.

If you have placed markers on several echoes to make them objects, you can select one of these and give it *priority* status. The bearing line in the relevant SU90 views will automatically be locked on the object with this priority to reflect its bearing. Only one single object can be given priority status. The priority is identified with a "P".

- **Initiate Track**

During normal operation, some echoes are clearly more interesting than others. In many situations specific echoes may be regarded as *targets*, and it can be useful to receive continuous information about the location, speed and heading of such targets. To set up the SU90 to provide such information, you can start *target tracking*.

The **Initiate Track** function allows you to manually start target tracking.

Place the cursor over the echo you wish to track. Select **Initiate Track**. The tracked target is regarded as an *object*, and it is identified with a circle and two lines. The bearing line is automatically locked on the object to reflect its bearing. A new tracked object is automatically given priority status. If another object has this priority, the status is transferred to the new object. The priority is identified with a "P".

- **Place Marker**

The **Place Marker** function allows you to create a marker at the current position of the cursor. Each marker is shown as a small triangle with or without a short identifying label.

- **Delete Marker**

Delete Marker allows you to delete a marker from the current view. Select **Delete Marker**.

- **Set Priority Marker**

One marker can be given priority status to identify the object as the most important target or position. If another object has this priority, the status is transferred to the new object. The priority is identified with a "P" When a marker is given priority it can be regarded as a *position track*. Relevant information about the priority object can be found in the lower left corner of the view.

- **Place Own Ship Marker**

Select **Place Own Ship Marker** to add a square symbol to the vessel's current position in the SU90 presentation. The own ship marker is now regarded as an *object*. All information about the object is shown in the **Objects** menu listed as "OSM".

- **Delete Own Ship Marker**

Use **Delete Own Ship Marker** on the shortcut menu to delete the marker from the current view.

- **Place Marker Continuous**

Place Marker Continuous is an on/off switch. When enabled, left-click in a SU90 view to add new marker. Each click produces a new marker.

- **Place Circle Marker**

Press **Circle Marker** on the Operating Panel, or select **Place Circle Marker** to add a circular marker to the SU90 presentation. A circular symbol appears at the cursor position. The circle is drawn with the same diameter as your purse. By means of the circle you can see the size of the school relative to your purse. You can only add one circle marker to the SU90 presentation.

The **Objects** menu does not provide any information about the circle marker.

To delete the circle marker, press **Circle Marker** on the Operating Panel, or right-click to select **Remove Circle Marker** on the shortcut menu.

The **Fishing Gear** function allows you to define the size of your trawl or purse seine. This function is opened from the **Setup** menu.

- **Show Gear Symbol**

The gear symbol is provided as a tool to help you plan and shoot the purse seine.

- **Place Ruler**

Place the cursor over the first echo. Right-click to open the shortcut menu, then select **Place Ruler**. The ruler starts wherever you place the cursor, and ends when you release the button. The length and relative bearing of the ruler is displayed next to it. Once a ruler has been established you can not make changes to it. You can place as many rulers as you like in the view.

Select **Delete Ruler** or **Delete All Rulers** on the shortcut menu to delete the one or several rulers from the view.

- **Delete Ruler**

Use **Delete Ruler** to remove one selected ruler from the view. Place the cursor on the line, right-click when the cursor turns into a finger, then select **Delete Ruler** from the shortcut menu.

- **Delete All Rulers**

Delete All Rulers allows you to delete all the rulers in the current view.

- **Ship To Centre**

Select **Ship to Centre** to move the own ship symbol back to the centre of the view. This function is typically used when you have used the **Set New Ship Centre** function to move the ship symbol away from the centre of the view.

- **Reset Ship Centre**

This function is useful when you need to "reset" the view after using the **Set New Ship Centre** or **Zoom** functions. Right-click and **Reset Ship Centre** to move the vessel symbol to the centre of the presentation.

- **Set New Ship Centre**

Place the cursor anywhere in the view, right-click and select **Set New Ship Centre**. The function moves the vessel symbol to the selected position.

- **Zoom**

Place the cursor anywhere in the view, right-click and select **Zoom**. Only one zoom level is provided. Select **Zoom** one more time to restore the original view.

- **Erase Echoes**

Select **Erase Echoes** to "refresh" the view by deleting all the current echoes.

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