

Introduction

This document describes the changes introduced with the new software version.

- **Product:** SU90
- **Software version:** 3.1.2

This software controls all functionality in the Simrad SU90. This includes transmission and reception, interfaces with external peripherals and sensors, and all user interface.

A firmware update for the Transceiver Unit is included with this SU90 release. The upgrade is only applicable for LPT32 transceiver boards. The new firmware must be installed on all the transceiver boards in the Transceiver Unit.

- **LPT32 firmware version:** FW 6.02 SW 19.01.24

More information: [Upgrading the firmware on the transceiver boards, page 13](#)

Software changes

This software version introduces a new user interface. This software update solves a number of software bugs that have been reported by our users, or detected during our own product testing.

Note _____

You must have an upgraded Processor Unit to run this version of the SU90. Contact your local dealer or distributor for advice.

The following specific changes have been made.

New user interface

This software version introduces a new user interface.

Horizontal and the vertical ping

In modes with multiple consecutive pings (for example *270°Vertical*) the horizontal and the vertical pings are transmitted right after each other in the same transmission. This increases the echo update rate accordingly. Do not use the same frequency for the different pings within the same mode.

Vertical views

The vertical views can now be configured to present the echoes from left to right, or from right to left. This can be changed in **Display Options** dialog box.

Display Range

Display Range has been added as an option for the **Off Centre** functionality. In the previous user interface only **Sonar Range** was available.

When **Sonar Range** is chosen, you will see that it appears as a virtual zoom. If you wish to keep the **Display Range** setting constant, the **Sonar Range** is automatically increased. The rate of increase depends on where in the horizontal view the **Off Center** symbol is placed. The purpose of this is to allow the current targets to keep their original sizes in the presentation.

This functionality is configured in the **Display Options** dialog box.

Adjustable bandwidth

Bandwidth is adjustable when you use FM (Frequency Modulated) transmissions. It is by default set to 0.5 kHz. You can choose to increase bandwidth manually. This provides a better range resolution. The optimal bandwidth must be

adjusted according to the current environmental conditions. .

We recommend that you set the **RCG** value to 7 or higher if you are using higher bandwidth

Fixed transmission sectors

The SU90 now supports fixed transmission sectors for the horizontal ping. In most cases the omnidirectional sector (360 degrees) is used. As an example, with land on one side, the SU90 works significantly better if the transmission sector is reduced, and only centred on the area or targets of interest. In *Dual Horizontal* mode this is easy to visualize by using a fixed sector for one ping and omnidirectional sector for the other.

BITE (Built-In Test Equipment) functionality

The SU90 now offers new **BITE** (Built-In Test Equipment) functionality. The dialog box is located in **Setup** menu.

The BITE function provides information about the current operational status. You can also run certain functional tests. The **BITE** dialog box also allows you to generate reports. These reports may prove helpful if you have problems with the SU90. You can export these reports to a USB flash drive using the functionality offered by the **Export** dialog box.

Important factors during installation

A few important factors must be taken into consideration during the SU90 installation and setting to work.

Remove old software version

You must remove the older versions of the software as well as all user settings.

More information: [Removing the SU90 operational software, page 3](#)

Transducer rotation around Z

The alignment of the transducer is now defined as *transducer rotation around Z*. The angle can be inserted as number between 0 and ± 180 degrees.

More information: [Defining the installation parameters for the transducer, page 5](#)

MRU rotation around Z

The alignment of the motion reference unit (MRU) is now defined as *MRU rotation around Z*. The angle must be inserted as number between 0 and ± 180 degrees, and it is referenced to the ship's bow.

More information: [Adjusting the built-in motion sensor offset, page 7](#)

New Operating Panel

A new Operating Panel has been introduced. In all end-user documentation this new Operating Panel is referred to as "Mk2".

- The mode buttons on the Operating Panel are dedicated for user settings. By default, no user settings are assigned to these buttons.
- During the SU90 installation you must create user settings, and then assign these to these mode buttons, for example *270°/Vertical* or *Dual Horizontal*.
- User settings must be stored with the transducer lowered. With the transducer in upper position the system protection settings will be applied.

More information: [Setting up the Operating Panel \(Mk2\), page 9](#) and [Assigning custom user settings to the Operating Panel, page 11](#).

System Protection

Check the **System Protection** setting when you define the middle position of the transducer. Make sure that the value on the **System Protection** page is *lower* than the middle position; otherwise the SU90 will turn off the transmit power.

More information: [Defining the middle position of the transducer, page 12](#)

Transceiver firmware

A firmware update for the Transceiver Unit is included with this SU90 release. The upgrade is only applicable for LPT32 transceiver boards. The new firmware must be installed on all the transceiver boards in the Transceiver Unit.

- **LPT32 firmware version:** FW 6.02 SW 19.01.24

More information: [Upgrading the firmware on the transceiver boards, page 13](#)

Pulse types

By default, the SU90 has *Continuous wave (CW)* and *Linear Frequency Modulated (LFM)* transmission modes available. To choose, use the **Pulse Type** function.

- If your SU90 uses LPT32 transceiver boards, you can change the FM pulse type from *Linear Frequency Modulated (LFM)* to *Hyperbolic Frequency Modulated (HFM)*.

More information: [Changing the setup files to enable HFM transmissions, page 13](#)

- If your SU90 uses TRX32 transceiver boards, only *Continuous wave (CW)* and *Linear Frequency Modulated (LFM)* modes are available.
- To see which type of transceiver boards you have, see the **Transceiver** page in the **BITE** dialog box.

Do I need to upgrade?

This update is important if you are using the SU90 on a Windows® 10 operating system. The introduction of new functionality, the improvements to the existing functionality, and the bug fixes all add value to your installation.

Note _____

This software version introduces a new user interface. If you are currently use version 2.1.12 or older you must upgrade your Processor Unit. Contact your local dealer or distributor for advice.

End-user documentation

End user documentation and online help for the Simrad SU90 is currently not available.

Software licenses

The Simrad SU90 is not a licensed product.

Removing the SU90 operational software

Before you can install the new software version, you must remove the old version. You must also remove the user settings. The file format for the user settings is not compatible with the format used in the older software versions.

Prerequisites

This procedure is made for the Microsoft® Windows® 7 operating system. It is assumed that you are familiar with this operating system. Operation in Microsoft® Windows® 10 is very similar.

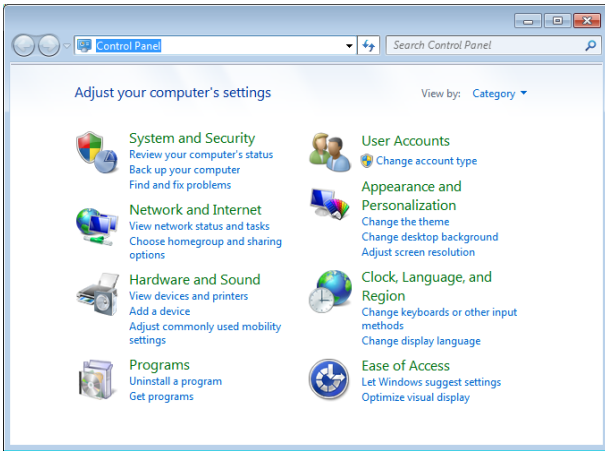
Context

Removal of the SU90 software is done using functionality provided by the operating system.

Procedure

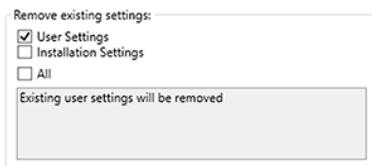
- 1 Turn on the Processor Unit.
- 2 Select **Power off** to turn off the system.
- 3 In the **Power Off** dialog box, select **Exit to Operating System** to close the SU90 program.

- 4 In the bottom-left corner of your desktop, select the Windows® **Start** button.
- 5 On the right-hand side of the **Start** menu, select **Control Panel**.



Observe that the Control Panel opens.

- 6 Uninstall the SU90.
 - a In the top right corner of the Control Panel, select Category view.
 - b Under **Programs**, select **Uninstall a program**.
 - c On the list of programs, locate the SU90 software.
 - d Select the program, and then right click to select **Uninstall**.
 - e Observe the **Remove existing settings** dialog box.
 - f Select only the check box for User Settings.
 - g Select **Uninstall** in the dialog box to remove the software.
 - h Follow the instructions provided by the wizard.
- 7 Click the [X] in the top right corner to close the Control Panel.



Software installation

When a new SU90 software version is released, it must be installed on your Processor Unit. Contact your local dealer, or a Simrad distributor, to have the new software version installed.

A dedicated wizard is used to install the SU90 software. Installation of additional operating system components may be required. These are installed automatically. Observe the information offered in the wizard.

If you have a preliminary ("Beta") software version installed, it must be removed before you can update. Use the operating system functionality to remove the old software version.

Registered dealers and distributors can download the new software version from the "Simrad Dealer Club". To access the "Simrad Dealer Club", visit our website.

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

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.

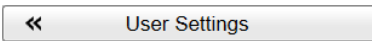
Context

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.

To save the settings you are using, select the **Save Current Setting** button.

Procedure

- 1 Make sure that you have sufficient water depth below the keel before you lower the transducer.
- 2 On the Operating Panel, press **Down**.
- 3 Observe the **Main** menu.
Its default location is on the right side of the SU90 presentation.
- 4 Select **User Settings**.



Observe that the **User Settings** dialog box opens.

- 5 Select **Save Current Setting**.
A small dialog opens to accept the name of the new setting.
- 6 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.*

- 7 Select **OK** to save the chosen name.
- 8 Observe that the name you have chosen appears on the **Saved Settings** list.
- 9 Select **OK** to close the dialog box.
- 10 On the Operating Panel, press **Up** to hoist the transducer.

Defining the installation parameters for the transducer

When the installation trunk is mounted, it may not be positioned with the mounting holes perfectly aligned to the centre line of the vessel. When the hull unit is placed on the trunk, the "forward" mark on the transducer shaft sleeve - and thus also "forward" on the transducer - may not point forward at all, but several degrees off the centre line. To obtain accurate SU90 presentations, this misalignment must be adjusted by changing the installation parameters.

Prerequisites

The SU90 is installed as specified in the SU90 *Installation manual*.

- The SU90 is turned on, and it is working normally.
- The SU90 is in *Normal* mode, but **TX Power** is set to *Off* to prevent transmission.
- The transducer is retracted to its upper position.
- The vessel is berthed or at sea.

Neither tools nor instruments are required.

Caution _____

You must never set the SU90 to "ping" unless the transducer is submerged in water. The transducer may be damaged if it transmits in open air.

For accurate location of the transducer, you need the detailed vessel drawings. You also need the alignment angle that was recorded when the hull unit was installed.

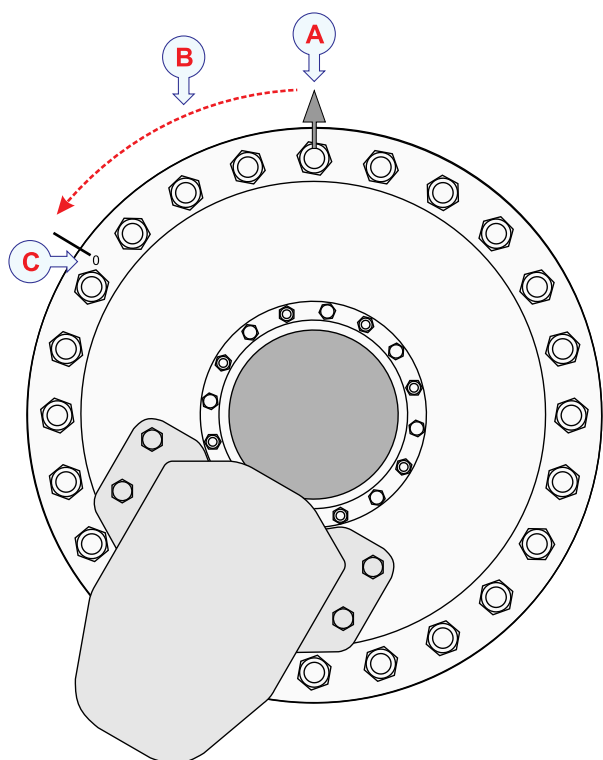


Illustration:

A Bow

B This is the alignment angle.

C 0° transducer mark

Context

As a general recommendation, the hull unit shall be oriented with the hoist/lower motor pointing aft. If this orientation makes it difficult to access the Motor Control Unit, the hull unit may be rotated during its installation to the most suitable direction. Independent of the hull unit orientation, the alignment is always defined as:

The angle measured from the bow to the 0° transducer mark.

The 0° transducer mark is located outermost on the mounting flange, and it is marked as a red "0".

Depending on the transducer mounting, it can be located at any angle on the mounting flange, not necessarily as shown in the illustration.

On the **Transducer** page, define this angle as rotation around **Z**.

- If the 0° transducer mark points to the starboard (right) side of the vessel's centre line, insert the alignment as a number between 0 and +180 degrees.
- If the 0° transducer mark points to the port (left) side of the vessel's centre line (as shown in the illustration), insert the alignment as a number between 0 and -180 degrees.

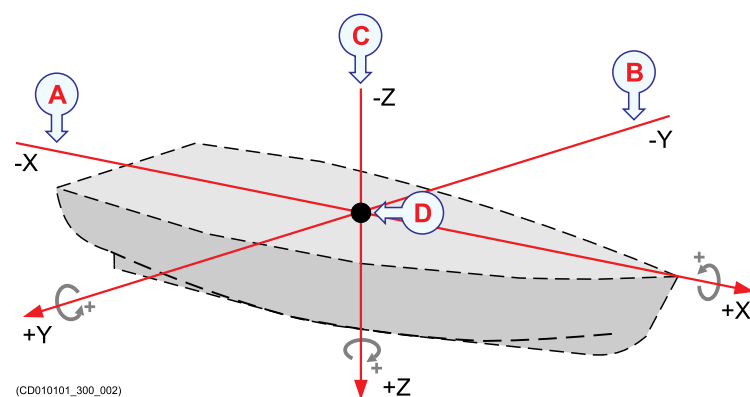


Illustration:

A Rotation around the x-axis: In the positive horizontal direction (forward), a positive rotation is clockwise.

B Rotation around the y-axis: In the positive horizontal direction (starboard), a positive rotation is clockwise.

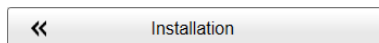
C Rotation around the z-axis: In the positive vertical direction (down), a positive rotation is clockwise.

D. Reference point (Ship Origin)

Procedure

- 1 Open the **Setup** menu.

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



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

- 3 On the left side of the **Installation** dialog box, select the small white triangle next to **Installation Parameters**.

Observe that a menu opens with access to all the individual pages.

- 4 Select **Transducer** to open the page.

- 5 Insert the relevant offset values.

- a **X Offset:** Insert the horizontal distance on the x-axis (fore-and-aft direction) between the transducer and the *Ship Origin*.
- b **Y Offset:** Insert the horizontal distance on the y-axis (athwartship direction) between the transducer and the *Ship Origin*.
- c **Z Offset:** Insert the vertical distance on the Z axis between the transducer and the *Ship Origin*.

To do this you will need the ship drawings.

- 6 Obtain the alignment angle from the personnel that installed the hull unit.
 - a **Rotation Around X:** Specify an angle (in degrees) to compensate for any deviation from the X axis (fore-and-aft direction) in the coordinate system. For systems using a hull unit this value should be set to 0 degrees.
 - b **Rotation Around Y:** Specify an angle (in degrees) to compensate for any deviation from the y-axis (athwartship direction) in the coordinate system. For systems using a hull unit this value should be set to 0 degrees.
 - c **Rotation Around Z:** Specify an angle (in degrees) to compensate for any deviation from the Z axis (vertical

direction) in the coordinate system. This is the alignment angle.

- If the 0° transducer mark points to the starboard (right) side of the vessel's centre line, insert the alignment as a number between 0 and +180 degrees.
- If the 0° transducer mark points to the port (left) side of the vessel's centre line (as shown in the illustration), insert the alignment as a number between 0 and -180 degrees.

Examples:

- If the alignment angle is 295 degrees, insert -65 degrees.
- If the alignment angle is 15 degrees, insert 15 degrees.

Do this as accurately as possible.

- 7 At the bottom of the page, select **Apply** to save your settings.
- 8 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Adjusting the built-in motion sensor offset

The information from a motion reference unit (MRU) (normally heave, roll and pitch information) is imported into the SU90 to increase the accuracy of the echo data. The SU90 is provided with a built-in motion sensor. It is placed inside the Motor Control Unit.

Prerequisites

The SU90 is installed as specified in the SU90 *Installation manual*.

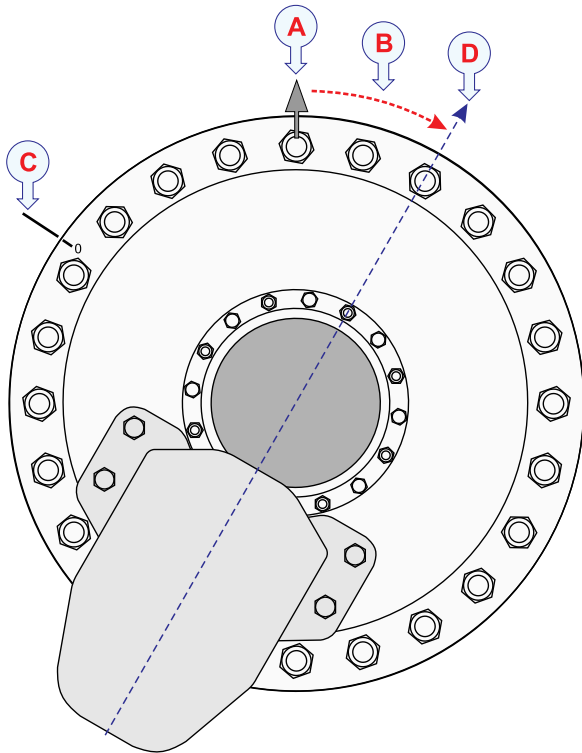
- The SU90 is turned on, and it is working normally.
- The SU90 is in *Normal* mode, but **TX Power** is set to *Off* to prevent transmission.
- The transducer is retracted to its upper position.

- The vessel is berthed or at sea.

Neither tools nor instruments are required.

Caution

You must never set the SU90 to "ping" unless the transducer is submerged in water. The transducer may be damaged if it transmits in open air.



- A Bow
- B. This is the offset angle.
- C. 0° transducer mark
- D. 0° motion sensor reference

Context

As a general recommendation, the hull unit shall be oriented with the hoist/lower motor pointing aft. If this orientation makes it difficult to access the Motor Control Unit, the hull unit may be rotated during its installation to the most suitable direction. The 0° reference for the built-in sensor is always related to the gantry. If the hoist/lower motor *does not* point aft (on or parallel to the vessel's centre line) the built-in motion sensor

offset must be defined. Independent of the hull unit orientation, the offset of the built-in motion sensor is always defined as:

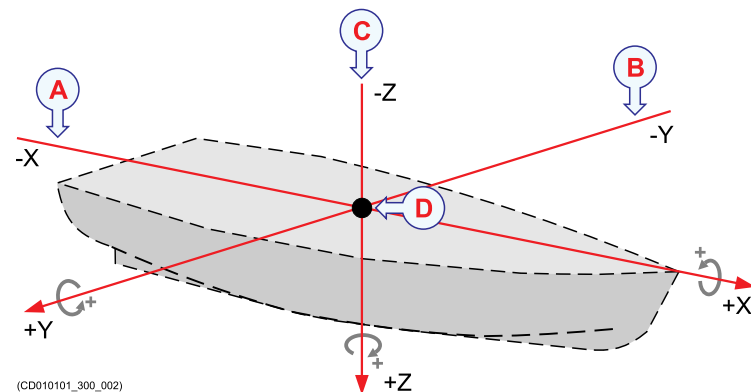
The angle measured from the bow to the motion sensor's 0° reference.

Tip

For improved operational accuracy, an external motion reference unit (MRU) may be used.

On the **MRU** page, define the offset as rotation around **Z**.

- If the 0° reference mark for the built-in motion sensor points to the starboard (right) side of the vessel's centre line (as shown in the illustration), insert the offset as a number between 0 and +180 degrees.
- If the 0° reference mark points to the port (left) side of the vessel's centre line, insert the offset as a number between 0 and -180 degrees.



A Rotation around the x-axis: In the positive horizontal direction (forward), a positive rotation is clockwise.

B. Rotation around the y-axis: In the positive horizontal direction (starboard), a positive rotation is clockwise.

C. Rotation around the z-axis: In the positive vertical direction (down), a positive rotation is clockwise.

D. Reference point (Ship Origin)

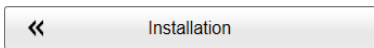
Procedure

- 1 Estimate the alignment angle from the bow (vessel's centre line) to the 0° reference mark for the built-in motion sensor.

Tip _____

The angle between each mounting bolt can be used as an aid. With 24 bolts, there are 15 degrees between each bolt.

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



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

- 3 On the left side of the **Installation** dialog box, select the small white triangle next to **Installation Parameters**.

Observe that a menu opens with access to all the individual pages.

- 4 Select **MRU** to open the page.
- 5 Insert the alignment offset angle as a rotation around **Z**.
 - If the 0° reference mark for the built-in motion sensor points to the starboard (right) side of the vessel's centre line (as shown in the illustration), insert the offset as a number between 0 and +180 degrees.
 - If the 0° reference mark points to the port (left) side of the vessel's centre line, insert the offset as a number between 0 and -180 degrees.
- 6 At the bottom of the page, select **Apply** to save your settings.
- 7 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Setting up the Operating Panel (Mk2)

The Operating Panel offers all necessary control functions for normal operation of the SU90.

Before it can be put to use, the Operating Panel must be configured to permit Ethernet communication between the panel and the Processor Unit.

Prerequisites

The Operating Panel is installed as specified in the *SU90 Installation manual*. The SU90 Processor Unit is turned on.

The following specific items are required for this task.

- Computer mouse
- Computer keyboard

Neither tools nor instruments are required.

Context

When supplied, the Operating Panel is set up with the following communication parameters:

- IP address: 157.237.60.20
- Subnet mask: 255.255.255.0
- Gateway: 157.237.60.1

To set up the Ethernet communication, you must define the IP address for the panel, and identify the Processor Unit in the panel software. These settings allow you to use more than one Operating Panel on the Processor Unit. You can also control more than one Processor Unit from a single Operating Panel.

The IP and MAC addresses for your Processor Unit are contained in a text file named `IPandMACaddress.txt`. The file contains the product name, IP address and MAC address in the following format (example):

```
SU90
157.237.60.13
AC:1F:6B:1D:42:E6
```

If the text file is missing you must find the information manually. We suggest that you do this, and create the necessary folder and txt file

before you start the setup process. See step 1 in the procedure.

Note _____

If the Operating Panel fails to establish contact with the Processor Unit it will time out and switch itself off after two minutes. When this happens the blue indicator light stops flashing.

Procedure

If required, locate the IP and MAC addresses on the ETH1 Ethernet adapter in the Processor Unit.

1 Obtain the IP address.

The IP and MAC addresses for your Processor Unit are contained in a text file named `IPandMACaddress.txt`. If the text file is missing you must find the information manually.

- a In the bottom-left corner of your desktop, select the Windows® **Start** button.
- b On the menu, select **Settings**.
- c Observe that the **Settings** window opens.
- d Select **Network & Internet**.
- e Select **Change adapter options**.
- f Select the relevant network adapter, then right-click and select **Properties** on the short-cut menu.
- g On the list of connections, select **Internet Protocol 4 (TCP/IPv4)**, and then **Properties**.
- h Observe the IP address for the Ethernet adapter.
- i Write down the information.
- j Close all the dialog boxes.

Obtain the MAC address.

- a In the bottom left corner of your desktop, select the looking glass to search the operating system.

- b Type "Command", do the search, and open the **Command Prompt** window.
- c Type **ipconfig /all** and press the **Enter** key.
- d Observe the "Physical Address" (MAC address) for the relevant Ethernet adapter.
- e Write down the information.
- f Close the **Command Prompt** window.

Select the adapter that the Operating Panel is connected to. On the SU90, the Ethernet adapter is named Simrad Connect.

Prepare the Operating Panel for use.

2 Make the following preparations.

- a Connect the power cable from the Operating Panel to the power outlet on the uninterruptible power supply (UPS).
- b Connect the Ethernet cable from the Processor Unit to the Operating Panel.
Make sure that you use the correct Ethernet socket on the rear side of the Processor Unit: ETH1
- c Connect the keyboard and the mouse to USB sockets on the front panel of the Processor Unit.
- d On the Processor Unit, close any programs that are running, and return to the desktop.
- e 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 you start the panel for the first time the interface must be configured to establish this connection. When the connection has been made, the blue indicator light is lit permanently.

- f On the Processor Unit desktop, open folder `SIMRAD-Shortcut`.
 - g Double-click file `IPandMACaddress.txt` to open it in a text editor.
 - h Double-click the URL shortcut to open the Operating Panel configuration page in the default web browser.
Observe that the Operating Panel configuration page opens on page `157.237.60.20: 5000`
- 3 Define the configuration parameters.
- a Select **SOP Configuration** on the top menu to open the page.
 - b Observe the default values.
If you wish to keep these default values, do nothing. The default values are well suited if you have one single panel communicating with one single Processor Unit. For other configurations, see the relevant procedures.
- 4 Add a single Processor Unit to the Operating Panel configuration.
- a Select **Sonar PCs Configuration** on the top menu to open the page.
 - b Type or copy the IP address into the relevant box.
 - c Type or copy the MAC address into the relevant box.
 - d Select **ADD Sonar PC**.
 - e Observe that your Processor Unit is added to the list.
 - f Close the web browser.
- 5 Make sure that the Operating Panel is functional.
- a Make sure that the blue indicator is lit, and check that you can move the cursor on the screen.
 - b On the Processor Unit desktop, double-click the SU90 icon to start the program.
Wait until the SU90 operates normally.
- c Press and hold **Power** depressed four minimum four seconds to turn off the Operating Panel.
Observe that the **Transceiver On/Off** dialog box opens automatically.
Make sure that the SU90 is turned off.
 - d Turn on the SU90 with the **Power** button on the Operating Panel.
 - e Make sure that you can control the cursor, and that you can make selections in the menu system.
 - f Press and/or turn selected buttons, and make sure that the corresponding function is activated in the user interface.

Assigning custom user settings to the Operating Panel

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. The Operating Panel allows you to assign certain functions to dedicated buttons and switches. This includes user settings.

Prerequisites

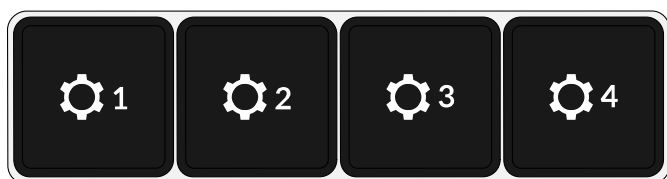
Before you can assign custom user settings to the operating panel, a selection of settings must be available from the **User Settings** dialog box. The **User Settings** dialog box is located on the **Main** menu.

Context

The **Operating Panel** page is used to assign functionality to the programmable buttons. This page is located in the **Installation** dialog box. The

Installation dialog box is located on the **Setup** menu.

The four buttons on the "top" of the operating panel are dedicated for user settings.



Procedure

- 1 Open the **Setup** menu.
- 2 On the **Setup** menu, select **Installation**.



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

- 3 On the left side of the **Installation** dialog box, select **Operating Panel**.
- 4 Under **User Setting Buttons**, assign one predefined setting to each button on the operating panel.
- 5 At the bottom of the page, select **Apply** to save your settings.
- 6 Continue your work in the **Installation** dialog box, or select **OK** to close it.

Defining the middle position of the transducer

The hull unit provided with the SU90 is designed to lower the transducer down below the ship's hull when the SU90 shall be used. When the SU90 is switched off, the transducer is hoisted for protection. The SU90 allows you to define a middle position for the transducer.

Prerequisites

The physical properties of the hull unit installation are known.

The correct type of hull unit is selected.

The vessel is berthed or at sea.

Context

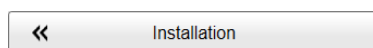
Select the middle position carefully. The position is normally selected to place the transducer just under the keel, but low enough to prevent echoes from the trunk. Once the position is selected, make sure that the system protection functionality does not inhibit transmission.

Procedure

- 1 Make sure that you have sufficient water depth below the keel before you lower the transducer.
- 2 Open the **Operation** menu.
- 3 On the top bar, select **Hull Unit** to access the control settings.



- 4 Select **[+]** and **[-]** to adjust the middle position.
- 5 Open the **Setup** menu.
- 6 On the **Setup** menu, select **Installation**.



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

- a On the left side of the **Installation** dialog box, select **System Protection** to open the page.
- b Make sure that the upper limit of the **Tx Inhibit Hull Unit Position** does not exceed the middle position.
- c Adjust the setting if it is necessary.
- d At the bottom of the page, select **Apply** to save your settings.
- e Close the **Installation** dialog box.

- 7 Lower the transducer to its middle position.
- 8 Start normal operation.
- 9 Make sure that the SU90 operates normally without transmitting into the installation trunk.

Upgrading the firmware on the transceiver boards

The Transceiver Unit is fitted with 12 transceiver boards. Make sure that the firmware on these boards is upgraded to the latest version.

Context

The process is started on the **Transceiver Upgrade** page. This page is located in the **Installation** dialog box. An **Upgrade** button is provided on the **Transceiver Upgrade** page if LPT32 transceiver boards are used.

if an upgrade is required, you are also notified in the SU90 message system. The relevant message is provided on the **Information** page in the **Messages** dialog box.

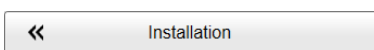
Note _____

The upgrade is only applicable for LPT32 transceiver boards.

To find out which transceiver boards your transceiver is fitted with, see the **Transceiver** page in the **BITE** (Built-In Test Equipment) dialog box.

Procedure

- 1 Turn on the SU90.
- 2 Take the necessary actions to prevent anyone from accidentally turning off the SU90.
- 3 On the **Setup** menu, select **Installation**.



Observe that the **Installation** dialog box opens. This dialog box contains a number

of pages selected from the menu on the left side.

- 4 Select **Transceiver Upgrade** to open the page.
- 5 Observe the **Upgrade** button.

An **Upgrade** button is provided on the **Transceiver Upgrade** page if LPT32 transceiver boards are used. If the **Upgrade** button is unavailable, a firmware upgrade is *not* possible.

- 6 Select **Upgrade** to start the process.
- 7 Acknowledge your choice in the next dialog box.
- 8 Observe the progress.

The upgrade process takes several minutes. Do not turn off the SU90 during the process. A message is shown when the process is finished.

- 9 Close the **Installation** dialog box.

Changing the setup files to enable HFM transmissions

The **Pulse Type** function allows you to select the "shape" of the transmitted pulses ("pings"). HFM (Hyperbolic Frequency Modulation) is only available if your SU90 Transceiver Unit is fitted with LPT32 transceiver boards. To use the pulse type, you must make changes to the setup files.

Prerequisites

It is assumed that you are familiar with the Microsoft® operating system utilities for file handling.

Context

To find out which transceiver boards your transceiver is fitted with, see the **Transceiver** page in the **BITE** (Built-In Test Equipment) dialog box.

Note _____

*When you change the setup files as described here, you will remove the LFM (Linear Frequency Modulation) pulse types from the **Pulse Type** function, and replace them with HFM.*

Procedure

- 1 Select **Power Off** on the top bar.
- 2 In the **Power Off** dialog box, select **Exit to Operating System** to close the SU90 program.
- 3 From the Windows® **Start** button, right-click to open Windows Explorer.
- 4 Navigate to the following folder:
C:\ProgramData\Simrad\SU90\InstallationOptions
- 5 Locate the following file: HFMforLPT32.xml
- 6 Copy the file to the following folder:
C:\ProgramData\Simrad\SU90\Installation
- 7 Close Windows Explorer.
- 8 On the Processor Unit desktop, double-click the SU90 icon to start the program.

Further requirements

If you later wish to use LFM (Linear Frequency Modulation) pulse types, simply delete HFMforLPT32.xml from folder

C:\ProgramData\Simrad\SU90\Installation.

Minimum display requirements

Unless specifically ordered, the SU90 is not provided with a display. The display must then be purchased locally.

You can use one or two displays on your SU90 Processor Unit depending on personal and/or operational preferences.

Note _____

Make sure that the chosen display meets the SU90 requirements. The design and construction must allow for marine use, and the display must be able to withstand the movements and vibrations normally experienced on a vessel. Verify that you have easy access to cables and connectors, and that the display can be installed in a safe and secure way.

The minimum technical requirements for the display are:

- **Resolution:** 1280 x 1024 pixels (Minimum)
The visual quality of the SU90 presentation depends on the quality of your graphic adapter and display. We recommend that you use a large display with resolution 1920 x 1080 or 1920 x 1200.
- **Video interface:** The video interface must match the output format(s) provided by the Processor Unit.
The Processor Unit may offer video output on several formats. Investigate your options before you purchase a display.
- **Physical screen size:** The screen size depends on personal and/or operational preferences. We recommend that you use 24 inch or bigger diagonal screen size.

The SU90 software supports 16:9 and 16:10 displays.