



SAL NAVIGATION

User Manual

SAL E200
Echo Sounder

Included documents

	Description	Doc. ID
1	List of items	892600
2	User manual	2400400
3	Appendix – Alert management	2400401

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List of items

Standard items for a system

Unit number	Name	Description
80.11.04	SAL TIC TRU Interface Cabinet	Transducer Interface Unit
80.12.07	ESD4	Echo Sounder Display
5493419	JBX EW1	Junction Box for transducer cable
2492322	TRU EW1 ET 50kHz Lower Part	Transducer for tank – part 1 of 2
2492326	TRU EW1 ET 50kHz Upper Part	Transducer for tank – part 2 of 2

Optional transducers

2492335	TRU ES1 SV 200kHz	Transducer for sea valve
2492330	TRU EW1 SV 200kHz	Transducer for sea valve
2492342	TRU EW1 ET 200kHz Lower Part	Transducer for tank – part 1 of 2
2492346	TRU EW1 ET 200kHz Upper Part	Transducer for tank – part 2 of 2
2492341	TRU EW1 ET 200kHz Upper Part WTC	Transducer for tank – part 2 of 2
2492352	TRU ES1 ET 200kHz Lower Part	Transducer for tank – part 1 of 2
2492356	TRU ES1 ET 200kHz Upper Part	Transducer for tank – part 2 of 2
2492351	TRU ES1 ET 200kHz Upper Part WTC	Transducer for tank – part 2 of 2
2492310	TRU EW1 SV 50kHz	Transducer for sea valve
2492315	TRU ES1 SV 50kHz	Transducer for sea valve
2492322	TRU EW1 ET 50kHz Lower Part	Transducer for tank – part 1 of 2
2492326	TRU EW1 ET 50kHz Upper Part	Transducer for tank – part 2 of 2
2492321	TRU EW1 ET 50kHz Upper Part WTC	Transducer for tank – part 2 of 2
2492362	TRU ES1 ET 50kHz Lower Part	Transducer for tank – part 1 of 2
2492366	TRU ES1 ET 50kHz Upper Part	Transducer for tank – part 2 of 2
2492361	TRU ES1 ET 50kHz Upper Part WTC	Transducer for tank – part 2 of 2

Notes:

- Only one transducer is necessary for operation, i.e., one transducer for sea valve or one set of Lower and Upper part for tank installation
- “EW1” = combined transducer for echosounder and speed log (STW).
- “ES1” = single transducer for echosounder.
- “SV” = for Sea Valve mount
- “ET” = an Easy Tank transducer, a complete tank solution with integrated transducer
- “WTC” = Water Tight Cable

Optional items

Unit number	Name	Description
2493391	FLANGE ET 116 STEEL	Steel bottom flange for TRU EW1 ET 200 kHz
2493392	FLANGE ET 116 ALU 5883	Aluminium bottom flange for TRU EW1 ET 200 kHz
2400004	MSSBSV EW1	Mounting Set Single Bottom with Sea Valve without Bottom Flange.
5413200	SAL R1E / T Bottom Flange SB	Steel bottom flange for single bottom
2400005	MSDBSV EW1	Mounting Set Double Bottom with Sea Valve without Bottom Flange.
2400008	SAL T Bottom Flange MSDBSV	Steel bottom flange for double bottom
2493427	TUB G1 D35 Extension Tube 350mm	Transducer Extension Tube for MSDBSV
2493424	TUB G1 D35 Extension Tube 500mm	Transducer Extension Tube for MSDBSV
2493426	TUB G1 D35 Extension Tube 800mm	Transducer Extension Tube for MSDBSV
2493425	TUB G1 D35 Connecting Tube	Transducer Connecting Tube

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1 ABOUT THIS MANUAL

1.1 General

The purpose of this manual is to give written instructions for every-day use.

- The operator of the product described in this user manual must read and follow the descriptions in this manual. Inaccurate operation or maintenance can cancel the warranty or cause injury.
- The contents of this manual and equipment specifications can change without notice.
- The image examples shown in this manual can be different from the views you see on your display.
- Your system configuration and equipment settings may affect what you see.
- Save this manual for future reference.
- Any modification of the equipment, including software, by people not authorized by the manufacturer cancels the warranty.



Risk Assessment:

We, as a manufacturer, evaluate that those applicable standards cover all reasonably foreseeable risks.



Note!

The setting up, installation and service procedure, which must be performed by specially-trained technicians, is described elsewhere.



Danger!

Hazardous voltage!

Do not remove covers! Only authorized personnel are allowed to do so.



Accuracy Warning!

On-screen depth readouts can be affected by air bubbles, water temperature, salinity, depth, and other underwater and seabed conditions, as well as the ship's roll and pitch. Consider these factors when navigating shallow areas or when accurate depth reading is crucial.



Depth Readout Warning!

With a transducer draft entered, the digital readout shows depth from the waterline, not from the transducer or the ship's keel. Use caution when navigating shallow waters and set the depth reference to "Below Surface" (DBS) to avoid misunderstandings.



Keel Offset Warning!

When the depth reference is set to "Below Keel," ensure the correct keel offset is entered to prevent misunderstandings about the depth readout.

**Alert Protocol Warning!**

Ensure the unit's alert handling protocol matches the ship's Bridge Alert Management (BAM) system. Using the wrong protocol prevents remote acknowledgment of active alerts or checking the current alert status.

**Liability Warning!**

Neither the manufacturer nor the dealer is responsible for loss of life, bodily injury, or property damage resulting from the use or inability to operate this equipment for any reason.

1.2 Symbols used in the manual

**Danger!**

Risk of serious or fatal injury to the user and/or severe damage to the product if the instructions are not followed.

**Caution!**

Risk of minor or moderate personal injury. Risk of equipment damage, loss of data, extra work or unexpected results if the instructions are not followed.

**Note!**

To alert about important facts and conditions.

**Information!**

To direct to specific instructions, such as where to find additional information and to tell how to perform a certain operation in an easier way.

1.3 Foreword

Please carefully read and follow the safety information, and the operating and maintenance instructions in this manual before starting to operate the equipment and conduct any maintenance.

The Echo Sounder system is designed to fulfil the latest rules and regulation set by authorities for vessels above 300 GT and passenger ships irrespective of size.

2 ABBREVIATIONS

NMEA0183 IEC 61162-1 serial interface standard

TRU Transducer unit

TIC	Transducer Interface Unit
ESD	Echo Sounder Display

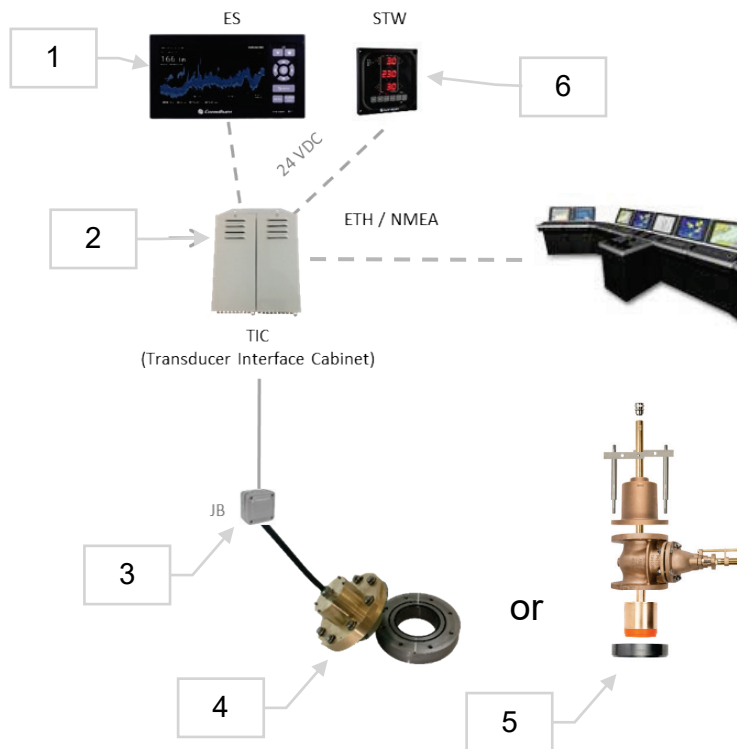
3 FEATURES

- Acoustic Noise Cancelling – suppressing external noise such as propeller cavitation, engine noise and nearby echo sounders, by the use of Digital Acoustic Codes.
- Marine life friendly by super silent acoustic properties.
- Echo sounder information, with fully automatic functions, on the display.
- The tank solution is approved as a “closed ended” installation - no need for watertight compartment or piping above waterline.
- Small-sized bottom arrangement – two functions in one TRU available – for easy installation.
- Serial communication directly from TRU enables long distance to electronic cabinet.
- No high voltage cabling from TRU (only 36 VDC and signal cables).

4 SPECIFICATIONS

Display:	9" color TFT
Range:	5, 10, 20, 40, 60, 100, 200, 400, 800 m 15, 30, 60, 120, 180, 300, 600, 1200, 2400 ft
Draft adjust:	100 m in 0.1 m steps
Presentation mode:	Single transducer view, Dual transducer view, History, Docking mode
Time range:	20 min dual view, 40 min single view, 24 h and 30 min history
Auto function:	Gain, Range, Sensitivity
Alarm function:	Depth, Power fail, System error
BAM interface:	Bridge Alert Management: MSC.302(87), IEC 62923-1/2 Ed. 1.0 (2018-08)
History function:	24 hours with 3 sec resolution
Measuring range:	Typical 0.5 to 200-300 m on 200 kHz, 1 to 400-800 m on 50 kHz depending on salinity and sea bed properties. Approval tests conducted at 2 and 200 m according to ISO 9875.
Accuracy:	0.1 m for depths less than 20 m
Roll and Pitch:	Roll 11°, Pitch 6°

5 SYSTEM OVERVIEW



1. Echo Sounder Display
2. Transducer Interface Cabinet – TIC
3. Junction box
4. Transducer: Easy Tank option
5. Transducer: Sea Valve option
6. Serial Digital Display (speed and distance)

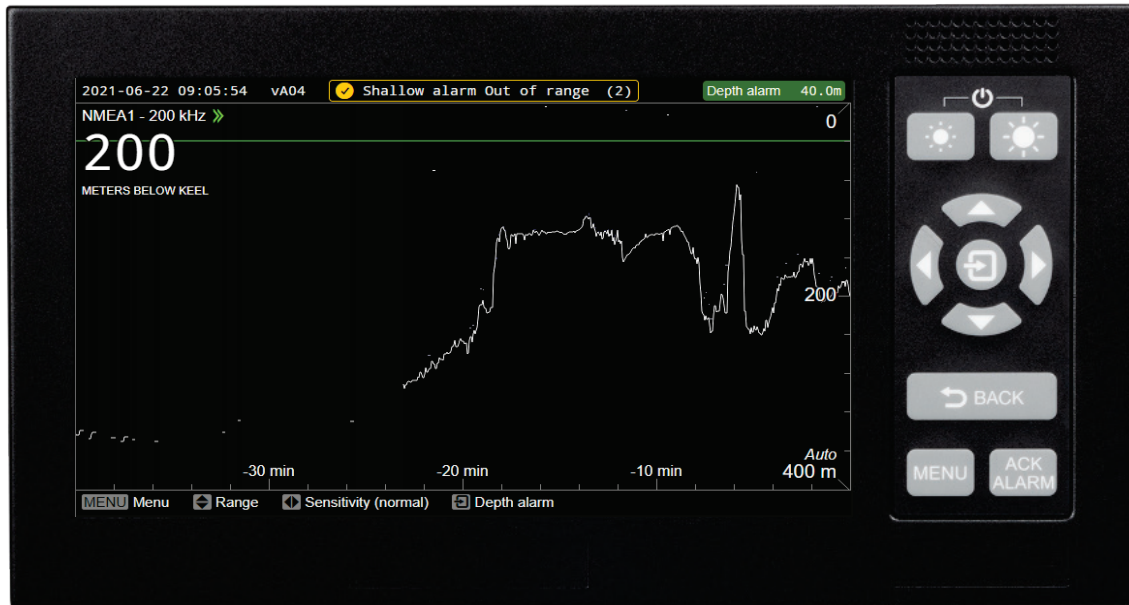


Note!

The image above shows a multi-functional system for STW speed log and Echo sounder. A single system for only Echo sounder with one Echo Sounder Display [1] and one TIC [2] is also available.

5.1 Introduction

The purpose of echo sounding equipment is to provide reliable information on the depth of water under a ship to aid navigation, particularly in shallow waters. The display is a ruggedized industrial computer with a 9" display in a metal cabinet with a non-touch display and a keypad.



5.2 Compliance to regulations

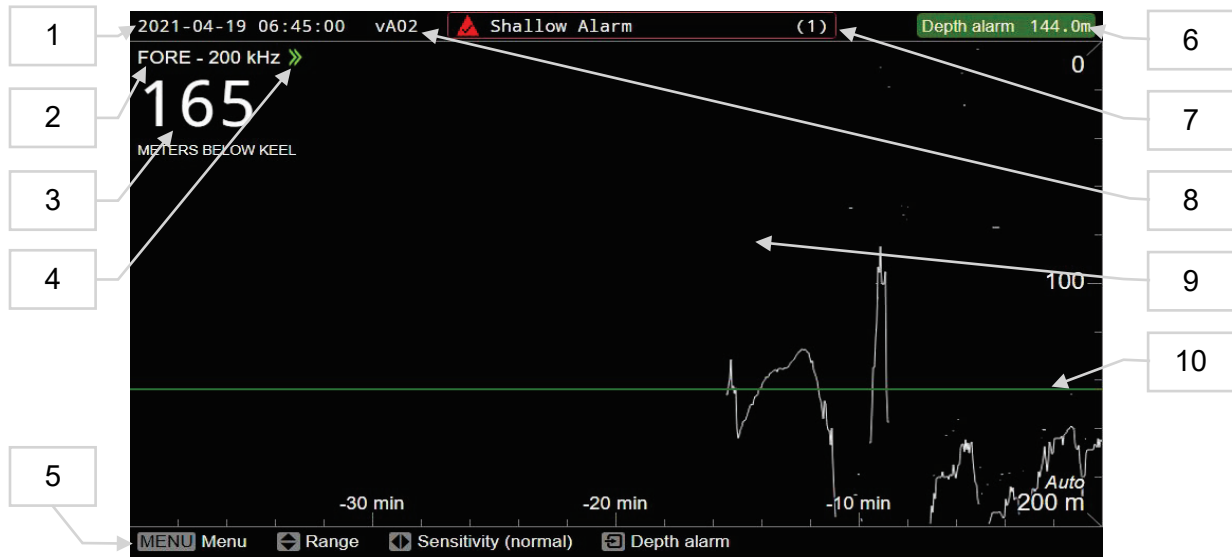
The display is compliant with:

- Standards for Echo Sounder equipment
IMO Res A.224 (VII) as amended by MSC.74(69)
ISO 9875 Ed.3
- Display standards
IMO Res MSC.191(79)
IEC 62288 Ed. 2
- Environmental standards
IMO Res A.694(17)
IEC 60945 Ed.4, corr 1
- Communication interface
IEC 61162-1:2016
- BAM, Bridge Alert Management
IEC 62923-1/2:2018

6 OPERATION

6.1 Display information

The Graphical depth window, example:



During normal operation, the following information is available:

1. Date and time
2. Selected transducer and frequency (single-transducer view shown in example above, see also dual-transducer view).
3. Current depth, unit, and reference point
4. Output Transducer. Data from this transducer is transmitted to external listeners.
5. Dynamic key bar, shows available keypad options.
6. Depth alarm setting
7. Alert message field
8. Software version
9. Graphical depth window
10. Depth alarm indication

6.2 Dynamic key bar



The Dynamic key bar shows available keypad options. The function of the keys differs between menus.

6.3 Keypad



Dimmer keys

Press to adjust the screen brightness and the keypad backlight. Maximum screen brightness turns off the keypad backlight. Press both keys simultaneously to put the display unit in stand-by mode and to power off the echo transmission. When in stand-by mode, press both keys simultaneously to re-activate operational mode.

Function keys

The function keys are used to navigate through the menu options, as indicated in the Dynamic Key Bar below the Graphical Depth Window.

BACK key

Press to go back one level.

MENU key

Press to open the Main Menu.

ALARM ACK key

Press to acknowledge an alert and silence the buzzer. Press and hold to open Alert list.



Note!

When the display is connected to an active power source the following keys will always have a backlight, even at maximum dimming and when in stand-by mode: Dimmer keys, MENU key and ALARM ACK key.



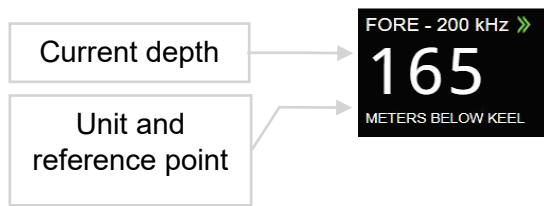
Note!

The Dimmer keys will only turn off the echo transmission from transducers powered by a TIC.

6.4 Graphical depth window

This window works like a paper chart moving continuously to the left and displays the depth history for the past 40 minutes. Accordingly, the current depth is shown at the right-hand side of the window, adjacent to the depth range scale.

6.4.1 Current depth, unit, and reference point



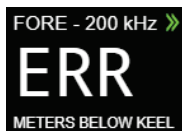
The reference point can be set in the menu to either of the following:

- Transducer
- Keel
 - Use the System setup / Transducer settings to set the Transducer-keel distance
- Surface
 - Use Menu to set Draft for each transducer

If the echo sounder fails to calculate the current depth the figure is replaced by one of the following.

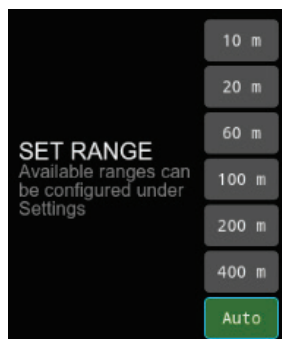


Three dashes are shown when the echo signal from the sea bed is lost or too weak.



ERR is shown when there is no input data on the corresponding serial port of the display.

6.4.2 SET RANGE menu



Pressing the up or down arrow keys on the keypad opens the SET RANGE menu of depth ranges available for the user. The depth range can be selected in nine different ranges in this

menu. An automatic range, Auto, is also available. In this example six ranges have been activated in Menu → Settings → System setup → Available ranges.



Caution!

The depth will be lost for depths exceeding any manually set range. Select Auto range to automatically find deeper depths.



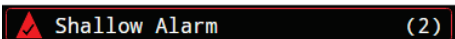
Note!

For Auto range the minimum depth is limited to 1 m. Setting the range manually to 20 m or less will enable a minimum depth of 0,5 m.

6.4.3 Sensitivity

Pressing the right arrow key on the keypad provides a more detailed view of the echoes, Sensitivity (high). Pressing the right arrow key on the keypad returns to Sensitivity (normal).

6.4.4 Alert Message Field



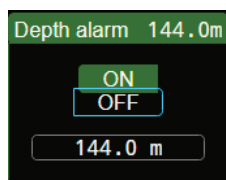
When an alert occurs, the alert text appears in the Alert message field. The number in parentheses is the total number of alerts in the alert list.



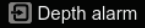
Information!

For further information regarding the alert handling, see the Alerts section.

6.4.5 Depth Alarm Field



The upper right corner field on the display, labeled **Depth alarm**, indicates current alarm limit set by the user.

The Depth alarm menu is opened by pressing the Apply key on the keypad when  is displayed in the Dynamic key bar. When the Depth alarm is on, a green line, the Depth alarm indication, is visible across the Graphical depth window.

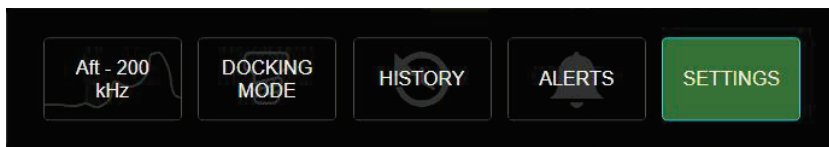
In the alarm-limit field, use the left or right arrow key on the keypad to change the alarm limit.



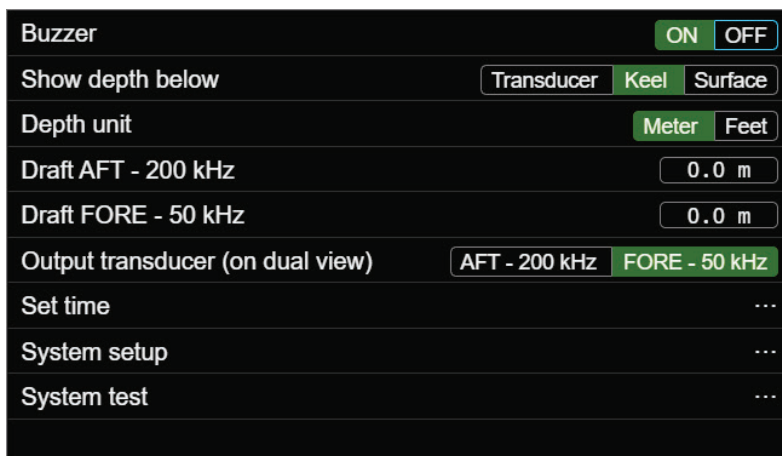
Note!

The same depth alarm setting is valid for both transducers when the display is set to split window mode.

7 SETTINGS



The **Settings** option enables various settings:



Note!

Select the three dots to the right and press Apply to get access to submenus.

7.1 Set time

Set time	
Automatically set time from GPS	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
Current time	2021-04-19 07:39:20
Year	<input type="text" value="2021"/>
Month	<input type="text" value="Apr"/>
Day	<input type="text" value="19"/>
Hour	<input type="text" value="7"/>
Minute	<input type="text" value="39"/>

**Note!**

If a GPS is connected to the speed log/echo sounder system, the time and date can be synchronized automatically to the UTC time.

7.2 System setup

**Caution!**

Do not access the System setup without having special training for the purpose of changing parameters. Be careful to only change intended parameters.

Selecting System setup opens:

Settings should only be edited by experienced users. Are you sure you want to continue?	
<input type="button" value="Cancel"/>	<input type="button" value="Continue"/>

Select Continue and press Apply to open the System setup submenu:

System setup	
Speed of sound editable	<input type="checkbox"/> ON <input type="checkbox"/> OFF
Available ranges	...
NMEA	...
Transducer settings	...
ESD SW Version	702398A04
BAM commissioning mode	...
Reboot display	...
Reset default settings	...
Factory reset	...

**Note!**

Select the three dots to the right and press Apply to get access to submenus. If asked for, select Continue and press Apply to open submenus.

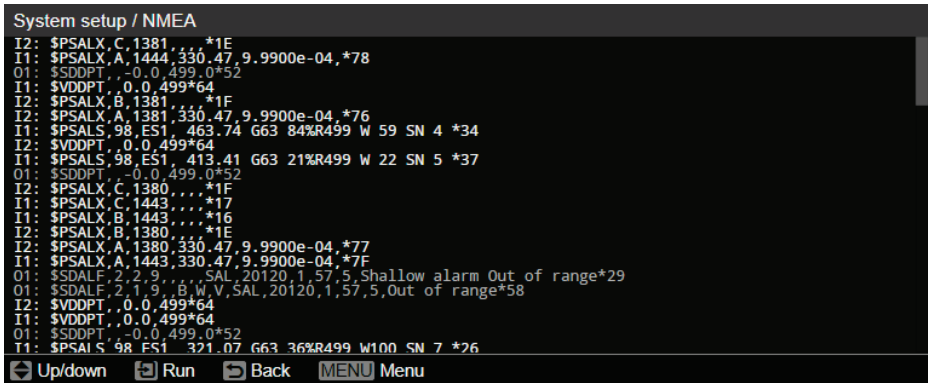
7.2.1 Available ranges

Select and activate/deactivate available ranges:

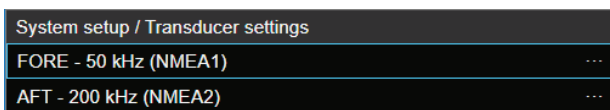
System setup / Available ranges	
5 m / 15 ft	<input type="checkbox"/> ON <input type="checkbox"/> OFF
10 m / 30 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
20 m / 60 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
40 m / 120 ft	<input type="checkbox"/> ON <input type="checkbox"/> OFF
60 m / 180 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
100 m / 300 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
200 m / 600 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
400 m / 1200 ft	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
800 m / 2400 ft	<input type="checkbox"/> ON <input type="checkbox"/> OFF

7.2.2 NMEA

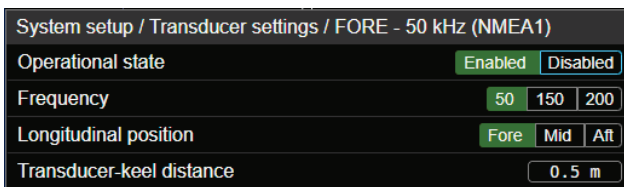
NMEA data received and sent by the display:



7.2.3 Transducer settings



Select the desired transducer and press Apply:



Note!

The parameter Transducer-keel distance does not affect the displayed depth values. This parameter is only used in the transmitted IEC 61162-1 sentence for the depth value.

8 MENU SYSTEM SINGLE TRANSDUCER

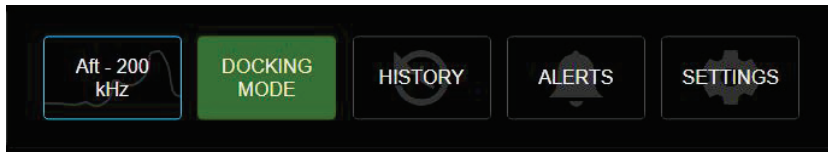
The Main Menu system is accessed by pressing the menu key on the keypad. Navigate the Main Menu as described by the Dynamic key bar.



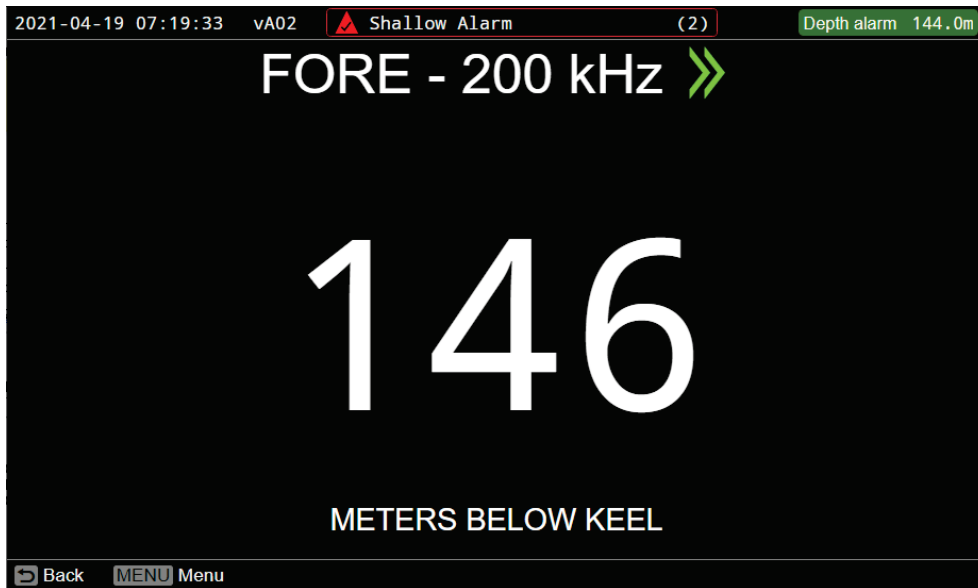
Information!

To use the dual transducer menu system, see Menu system dual transducer.

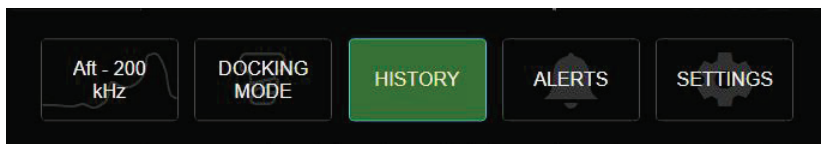
8.1 Docking mode



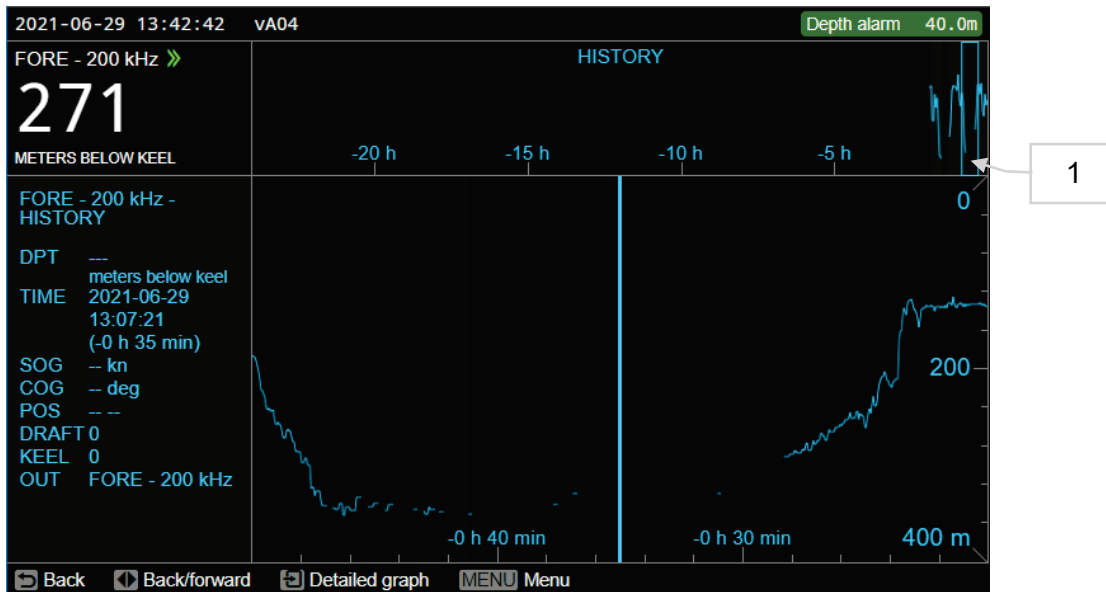
The **DOCKING MODE** option is used to clearly see the depth figure from a distance, e.g., while operating the vessel far away from the Echo Sounder display:



8.2 History



The **HISTORY** option shows a graph of the latest 24 hours activities:



This window makes it possible to study any 30-minute period from the last 24 hours. Use the left or right arrow key on the keypad to select the desired 30-minute period [1]. Press Apply to see a more detailed graph. Press Apply again to go back to the simple graph. Further details of the depth history data can be viewed in the field to the left.

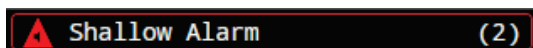


Note!

The selected depth range is valid for both the **Graphical depth window** and the **24h History view**.

8.3 Alerts

When an alert occurs, the alert text appears in the Alert message field. The number in parentheses is the total number of alerts in the alert list.

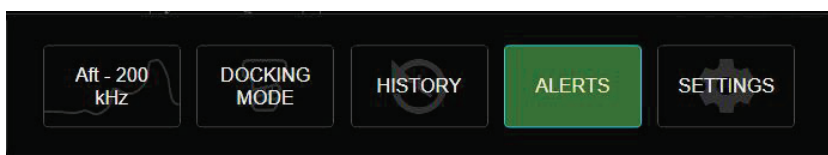


It is always the latest alert with the highest priority that is shown in the Alert message field.



To acknowledge an alert and silence the buzzer, press the ALARM ACK key on the keypad. The ALARM ACK key also opens the alert list when all active alerts are acknowledged, or when pressed down for longer than one second.

The alert list is also available in the Menu → Alerts.



The **ALERTS** option shows a list of active and un-acknowledged alerts. An alert remains in the list until acknowledged and non-valid.

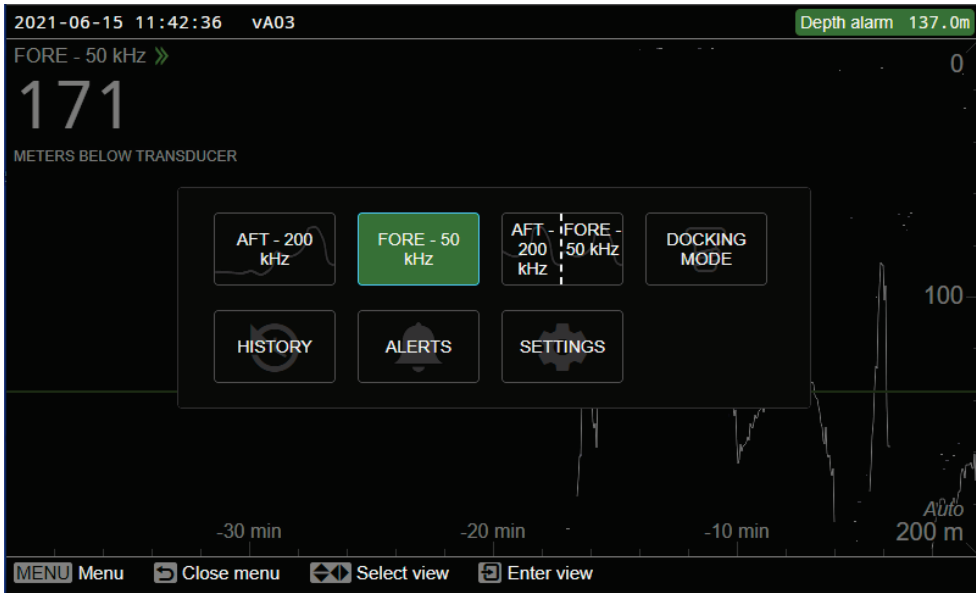
**Note!**

For further information about the Alert List, Alert Management Icons, and Alert Priorities, see Appendix Echo Sounder Alert Management.

9 MENU SYSTEM DUAL TRANSDUCERS

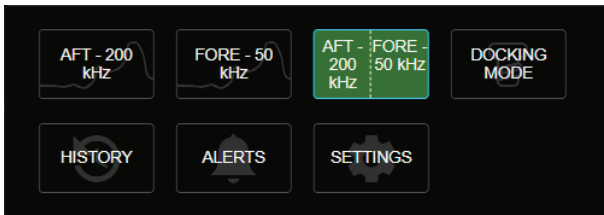
**Information!**

To use the single transducer menu system, see Menu system single transducer.

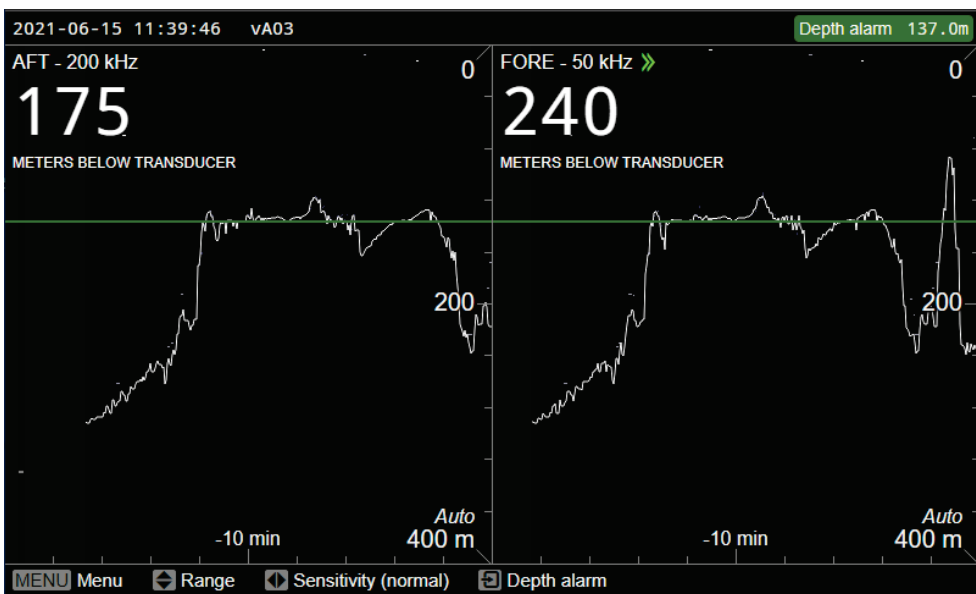


The Main Menu system is accessed by pressing the Menu key on the keypad. Navigate the Main Menu as described by the symbols in the footer.

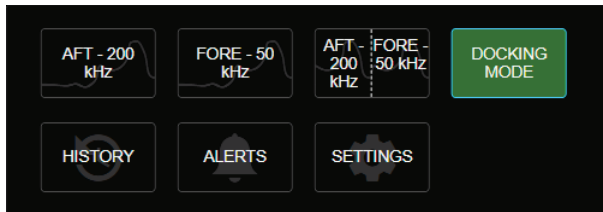
9.1 Dual transducers split view option



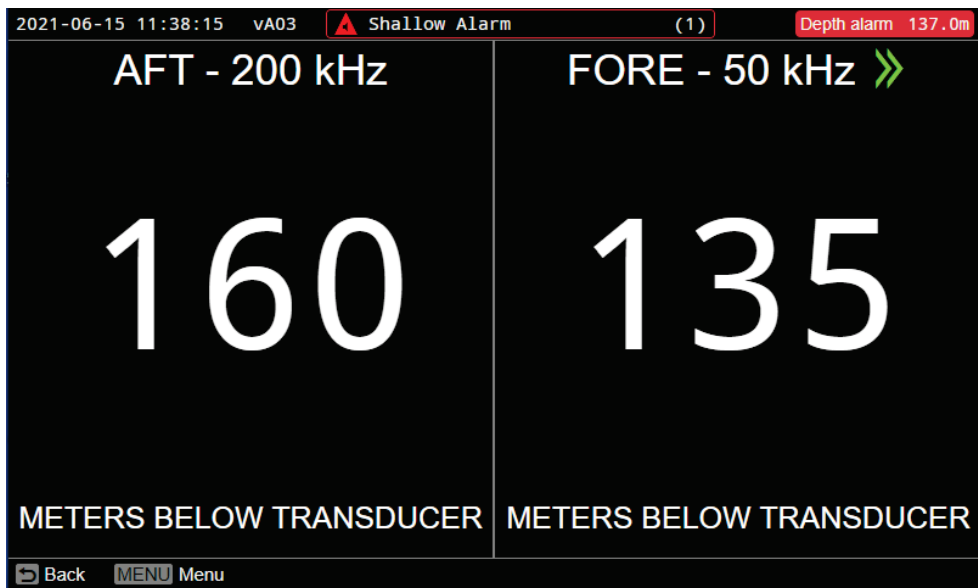
The dual transducers split option shows the Graphical depth window shared by both transducers.



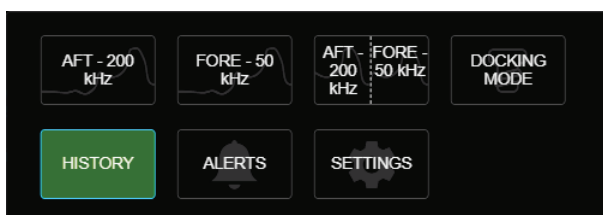
9.2 Docking mode (dual transducers)



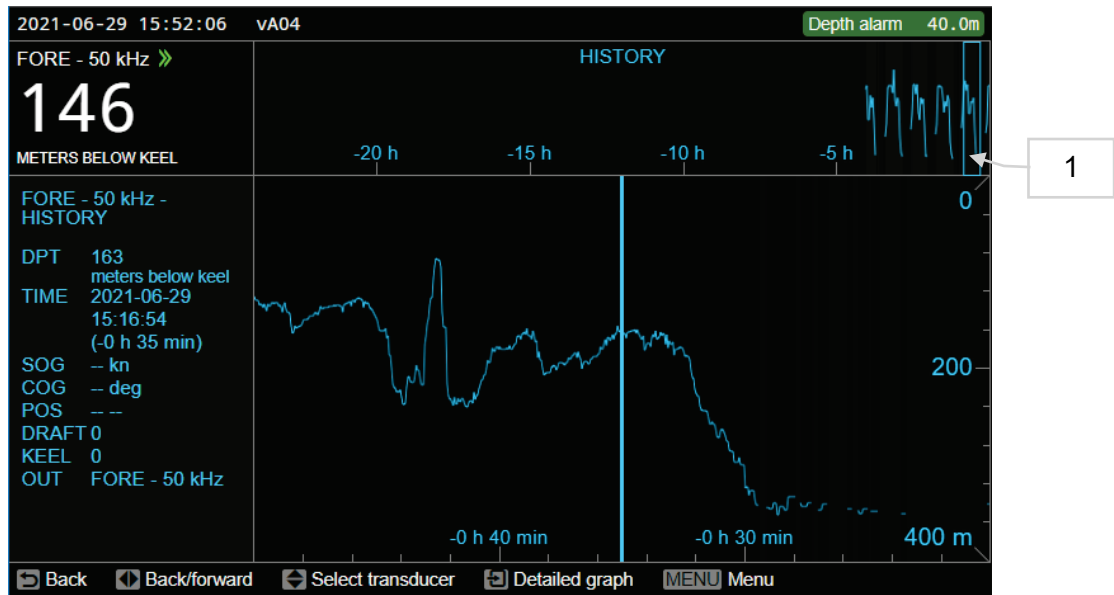
The **DOCKING MODE** option is used to clearly see the depth figures from a distance, e.g., while operating the vessel far away from the Echo Sounder display:



9.3 History (dual transducers)



The **HISTORY** option shows a graph of the latest 24 hours activities:

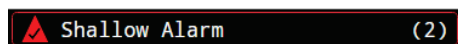


This window makes it possible to study any 30-minute period from the last 24 hours. Use the left or right arrow key on the keypad to select the desired 30-minute period [1]. Press Apply to see a more detailed graph. Press Apply again to go back to the simple graph. Further details of the depth history data can be viewed in the field to the left.

Select which transducer history to view by using the up or down arrow.

9.4 Alerts (dual transducers)

When an alert occurs, the alert text appears in the Alert message field. The number in parentheses is the total number of alerts in the alert list.

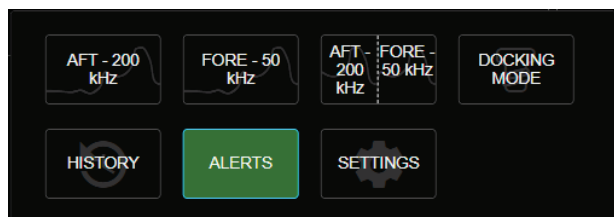


It is always the latest alert with the highest priority that is shown in the Alert message field.



To acknowledge an alert and silence the buzzer, press the ALARM ACK key on the keypad. The ALARM ACK key also opens the alert list when all active alerts are acknowledged, or when pressed down for longer than one second.

The alert list is also available in the Menu → Alerts.



The **ALERTS** option shows a list of active and un-acknowledged alerts. An alert remains in the list until acknowledged and non-valid.

**Information!**

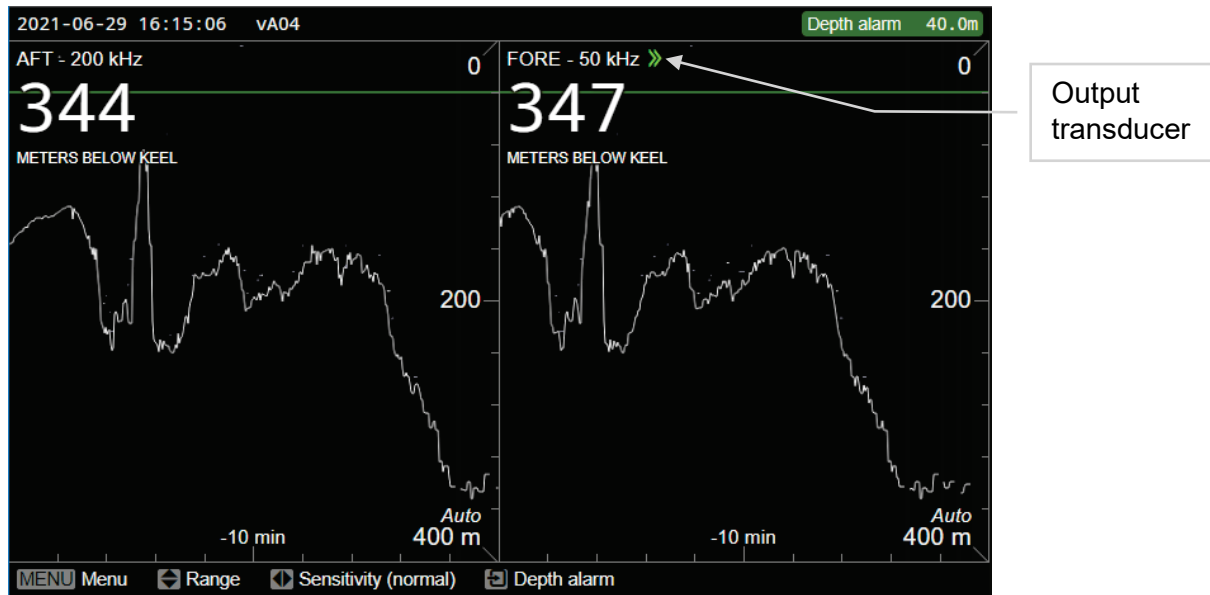
When the display is in dual window mode both transducers must lose bottom track before the alerts 115 Out of range, Bottom lost and alert 120 Out of range, Shallow alarm are activated.

**Note!**

For further information about the Alert List, Alert Management Icons, and Alert Priorities, see Appendix Echo Sounder Alert Management.

9.5 Output transducer

Transducer data is sent to external listener. In single view mode the selected transducer data is sent to external listener. In dual view mode it is the data from the transducer selected in the Settings option that is sent to an external listener.



10 TEST METHODS

10.1 TRU Mounting Inspection

To verify that the TRU is in the correct downward and flush seated position.



Note!

Easy Tank is a closed ended tank installation without sea-valve, where inspection must be done by a diver or in dry dock.

- Make a reference mark on the Connecting Tube close to where it enters the Valve top cover.
- Loosen and remove the two nuts and spring washers holding the bracket assembly down. Be aware of outside sea water pressure, i.e. firmly handhold the Tube bracket/Connecting Tube!
- Raise the Tube Bracket/Connecting tube out from the threaded rods and turn 90 degrees and then push firmly downwards again to firm stop. A slight splash of sea water will temporarily occur when the slots are passing the water seals in the Valve top cover.
- The brackets shall not rest on the bolt heads; there shall be a gap of approx. 3mm when the TRU is in the lowest position – stopped by the Guide ring and the stop shall have the same height as the mark to be in the same position/level as before. If not, re-adjustment will be needed.
- Return the Connecting Tube/Tube Bracket to its normal position considering possible adjustments as above.
- Verify that the alignment/flat mark (SB) on the Connecting Tube is facing towards starboard and aligned parallel with ship's keel/longitudinal line. If not, readjustment will be needed.

- After necessary checks/adjustments assure that the Tube Bracket clamping screws and top nuts are tightened in proper position.

10.2 TRU Sensor Surface Inspection



Note!

This TRU Sensor Surface Inspection is only valid for installations with a sea valve.



Note!

Easy Tank that is a closed ended installation without sea-valve, where inspection must be done by a diver or in dry dock.

- Also here recommend making a reference mark on the Connecting Tube close to where it enters the Valve top cover.
- Loosen and take of the two nuts and spring washers holding the bracket assembly down. Be aware of outside sea water pressure, i.e. firmly handhold the Tube bracket/Connecting Tube!
- Raise the Connecting Tube/Tube Brackets 150 mm, the plastic part of the TRU is then ~ 40mm over the Valve cover top. **Do not lift higher before the Sea Valve is closed!** A slight splash of sea water will temporarily occur when the slots are passing the water seals in the Valve top cover.
- Close the Sea Valve (assuring the retracted position of the TRU as above!), approximately 14 full turns of the hand wheel from fully open to fully closed valve. Observe the position indicator pin and feel the resistance when the valve gate comes to closed position.
- Carefully lift out the TRU assembly from the Sea Valve assuring that sea water is not severely pouring out from the Sea Valve. If so, again insert the TRU tip as a plug and try to close the valve more rigidly and/or yank the valve gate back and forth a few times in the closing position to try improving tightness.
- Verify as needed by lifting out the TRU and continue as intended.
- Carefully inspect and clean the TRU sensor surface from overgrown algae/marine growth. Do **NOT** use any sharp/metallic tool that may damage to the TRU sensor surface. Plastic or wooden scraper or cloth rag is normally enough for rubbing off and cleaning.
- Check that the TRU sensor surface is undamaged, i.e., no scratches or indents.
- Provided actions are completed, or TRU has been exchanged, re-install the TRU assembly in the Sea Valve carefully considering above retraction/dismounting precautions avoiding touching/reaching the valve gate.
- Fully open the Sea Valve (14 full turns to fully opened position) while holding the TRU Connecting Tube against water pressure.
- Push the TRU firmly downwards engaging the Tube Bracket, to its operating position.
- Check that the alignment mark on the Connecting Tube is facing towards starboard and aligned parallel with ship's longitudinal/keel line.
- After necessary checks/adjustments assure that the Tube Bracket clamping screws and top nuts are tightened in proper position.

11 MAINTENANCE

11.1 Preventive

Check regularly that the display is clean and remove dust from the display units. Wipe with damp cloth and mild detergent.

11.2 TRU

Carefully inspect and clean the TRU sensor surface from overgrown algae/marine growth.



Caution!

Do not use any sharp/metallic tool that may damage to the TRU sensor surface. Plastic or wooden scraper or cloth rag is normally enough for rubbing off and cleaning.

11.3 Fuses

Before power-up, carefully verify the Mains power voltage and the integrity of the fuses.



Note!

There are no exchangeable fuses in the TIC. Disconnect the fuses in the fuse cabinet, which serves the TIC to disconnect the power.

11.4 Dry-docking procedures

Always inspect the bottom parts in connection with dry docking.



Caution!

Always switch off the Echo-Sounder system power during dry docking. The transducer can be damaged if it transmits signals into the open air.

11.5 Stored data files and data retrieval

The following data is continuously stored internally:

- The last 24 hours NMEA data.
- Encrypted log files for software quality evaluation.

When inserting a USB drive, a zip file **ESD4_logs_YYYYMMDD_HHMMSS.zip** is created on the USB drive. The zip-file contains:

- A screenshot of the ESD display: ESD4_screen_YYYYMMDD_HHMMSS.png
- NMEA logs: NMEA_logs_YYYYMMDD_HHMMSS.zip
- Encrypted logs
- Encrypted key



Caution!

If the internal clock is adjusted backwards, manually or by the GPS, all history data may be automatically reset. If adjusted more than 20 minutes the history data will always be reset. The NMEA logs for USB export will not be affected.

11.6 Software update from USB

After data retrieval to USB has completed, the USB will be checked for a software update package in the folder named **update**. The user has to manually confirm the installation of the software update and the required reboot.

Only encrypted software signed by the manufacturer can be installed. If more than one or no software package is found, the update is cancelled and the user will be requested to remove the USB drive.

12 TROUBLESHOOTING



Information!

See the appendix about alert management.

APPENDIX – Echo Sounder Alert Management

General







All symbols and behaviour have been implemented according to IEC62923-1, tables F.1, 3, 4 and 5.






List of alerts

Alert ID	Title	Description	Priority / Category	Additional Information
20115	Out of range		Caution / category B	Bottom echo lost. Cannot measure depth.
20120	Out of range	Shallow alarm Out of range	Warning / category B	Active when shallow alarm is on and depth cannot be measured.
20126	No ES Data	No ES Data <i>source ID</i>	Warning / category B	No Depth data from connected device (<i>source ID</i>). Order service.
3022	Power Supply low		Warning / category B	The input voltage to a device is low. Check power supply. Check transducer connection on terminals. Order service.
3031	Shallow Alarm		Alarm / category A	Depth is less than Shallow Alarm setting. Active when the shallow alarm is triggered.

The "active – unacknowledged" warnings are repeated as warnings.

Symbols

Icon	Name Description	Priority	Color
	<p>Active – unacknowledged alarm</p> <p>The cause of the alert is still present. A flashing red triangle with a loudspeaker. Flashing: One second interval. Buzzer: 3 short beeps repeated every 8s.</p>	Alarm	Red
	<p>Active – silenced alarm</p> <p>The buzzer has been silenced and the cause of the alert is still present. This state can only be ordered from BAM/CAM. A flashing red triangle with a loudspeaker crossed over by a diagonal line. Flashing: One second interval. Buzzer: Silent.</p>	Alarm	Red
	<p>Active – acknowledged alarm</p> <p>The alert is acknowledged by the operator and the cause of the alert is still present. A red triangle with an exclamation mark. Flashing: No. Buzzer: Silent.</p>	Alarm	Red
	<p>Active – responsibility transferred alarm</p> <p>A red triangle with an arrow pointing towards the right. Flashing: No. Buzzer: Silent.</p>	Alarm	Red
	<p>Rectified – unacknowledged alarm</p> <p>A flashing red triangle with a tick mark. Flashing: One second interval. Buzzer: Silent.</p>	Alarm	Red
	<p>Active – unacknowledged warning</p> <p>A flashing yellowish orange circle with a loudspeaker. Flashing: One second interval. Buzzer: 2 short beeps, repeated once every 4,5 min. Repeated as Warning</p>	Warning	Orange

	<p>Active – silenced warning</p> <p>A flashing yellowish orange circle with a loudspeaker crossed over by a diagonal line. Flashing: One second interval. Buzzer: Silent.</p>	Warning	Orange
	<p>Active – acknowledged warning</p> <p>A yellowish orange circle with an exclamation mark. Flashing: No. Buzzer: Silent.</p>	Warning	Orange
	<p>Active – responsibility transferred warning</p> <p>A yellowish orange circle with an arrow pointing towards the right. Flashing: No. Buzzer: Silent.</p>	Warning	Orange
	<p>Rectified – unacknowledged warning</p> <p>A flashing yellowish orange circle with a tick mark. Flashing: One second interval. Buzzer: Silent.</p>	Warning	Orange
	<p>Caution</p> <p>A yellow square with an exclamation mark. Flashing: No. Buzzer: Silent.</p>	Caution	Yellow

Definitions

Alert

An alert is an announcement of abnormal situations and conditions requiring attention. Alerts are divided in four priorities: emergency alarms, alarms, warnings and cautions. An alert provides information about a defined state change in connection with information about how to announce this event in a defined way to the system and the operator. Alert categories used by the Echo Sounder system.

Alarm

An alarm is a high-priority alert. Condition requiring immediate attention and action by the bridge team, to maintain the safe navigation of the ship.

Warning

A warning is an alert for condition requiring immediate attention, but no immediate action by the bridge team. Warnings are presented for precautionary reasons to make the bridge team aware of changed conditions which are not immediately hazardous but may become so if no action is taken.

Caution

A caution is the lowest priority of an alert. Awareness of a condition which does not warrant an alarm or warning condition, but still requires attention out of the ordinary consideration of the situation or of given information.

Responsibility transfer

Responsibility of Alert 3031, 3022, 20120 and 20126 can be transferred to a CAM system. For these Alerts the presentation from state “normal” to state “active unacknowledged” is delayed 5 seconds to accommodate for the CAM to take over responsibility. If responsibility of the Alert is taken over by the CAM, the Echo-Sounder will present the Alert as “active - responsibility transferred” and if it’s taken over within the time-slot of 5 seconds, no audible alarm will sound.

For the Echo Sounder to accept a responsibility transfer request, the CAM must send out heartbeats. If the heartbeat stops the Echo Sounder will take back the responsibility of all transferred Alerts.