SIMRAD®

R5000 Radar System

Commissioning manual

English



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Preface

Disclaimer

⚠ Warning: Refer to important safety information in the product documentation and review all warnings, limitations, and disclaimers before using this product.

This product is not a substitute for proper training and prudent seamanship. It is the owner's sole responsibility to install and use the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing maritime safety practices.

Navigational features that appear in this document are not a substitute for proper training and prudent seamanship. They do not replace a human navigator and SHOULD NOT be relied on as a sole or primary source of navigation. It is the operator's sole responsibility to use more than one navigational methods to ensure the route suggested by the system is safe.

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Warranty

The warranty card is supplied as a separate document. In case of any queries, refer to the brand website of your unit or system:

www.navico-commercial.com

Compliance statements

Navico declares under our sole responsibility that the product conforms with the requirements of:

- European Council Directive 2014/90/EU on Marine Equipment modified by Commission Implementing Regulation (EU) 2023/1667 (8 August 2023) - Wheelmark

➔ ***Note:*** The R5000 system is Wheelmark approved only when installed according to the relevant R5000 MED-B certificate.

United States of America

This product has been assigned **U.S. Coast Guard Module B number** in accordance with the European Council Decision 2004/425/EC dated 21 April 2004 on the conclusion of an Agreement between the European community and the United Stated of America on Mutual Recognition of Certificates of Conformity for Marine Equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

> ⚠ Warning: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

➔ ***Note:*** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver is connected
- Consult the dealer or an experienced technician for help

Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Declarations

The relevant declarations of conformity and certificates are available at:

www.navico-commercial.com

About this manual

Intended audience

The manual assumes that the reader has basic knowledge about this type of equipment with regards to:

- commissioning of complex radar systems
- nautical terminology and practices

Important text conventions

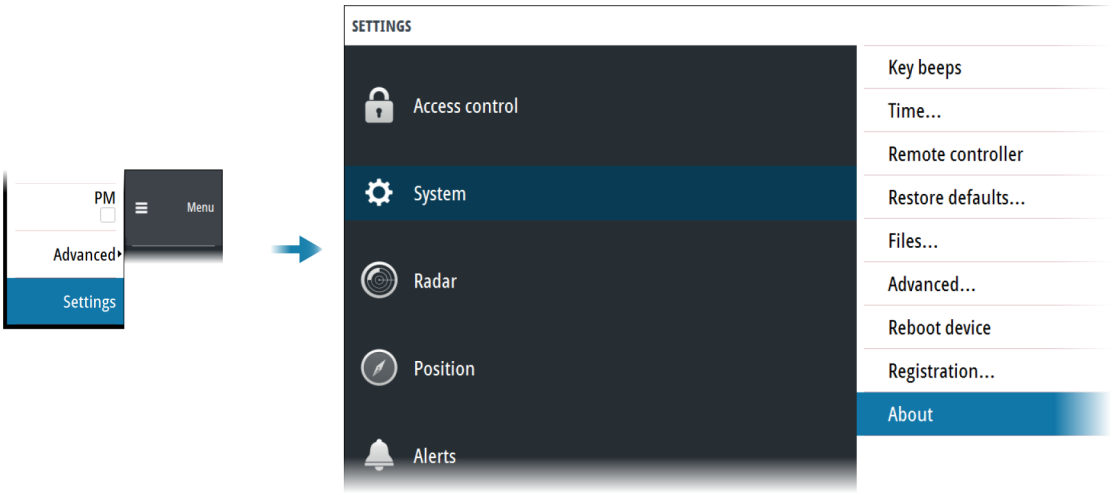
Important text that requires special attention from the reader is emphasized as follows:

➔ ***Note:*** Used to draw the reader's attention to a comment or some important information.

⚠ Warning: Used when it is necessary to warn personnel that they should proceed carefully to prevent risk of injury and/or damage to equipment/ personnel.

Software version

You can view the software version installed on the unit in the about dialog:



The manual will continuously be updated to match new software releases. The latest available manual version can be downloaded from the product website on:

www.navico-commercial.com

Change log

Part no	Date and description
988-12293-001	2018-Sept-19
	First version.
988-12293-002	2018 - Nov-01
	Updated to match software release.
988-12293-003	2021-July-25
	Updated to add LWE information.
988-12293-004	2023-Sept-25
	Update cover, compliance, and copyright. Add HALO 5000 information.
988-12293-005	2023-December-15
	Update to comply with IEC62288 Ed.3.

Safety precautions

Safety precautions described in this section are applicable to the radar system. They are general safety precautions that are not related to any specific procedure, and they might therefore not appear elsewhere in this manual. They are recommended precautions that personnel must understand and apply during operation and maintenance of the system.

You are obliged to read these operating instructions prior to operation, and to adhere to the operating instructions in order to prevent possible danger. Prevention of danger includes that operator personnel are trained and authorized for safe operation of the equipment. We assume no liability for damage due to improper operation which could have been prevented.

The system must only be operated by persons who have passed the relevant mandatory training on the respective systems and applications. Only reading these operating

instructions cannot replace such training. Persons authorized to operate, maintain and troubleshoot the system are instructed and trained by Simrad. Persons operating or servicing this radar system must be familiar with the general safety regulations and specific safety systems, and they must have passed all required training. They must have read the relevant operating instructions and manuals before starting to work.

Have these operating instructions always at hand on all relevant locations, and ensure that copies are available to all operators. Operating personnel must at all times follow all safety regulations.

During normal operation, the unit can be quickly disconnected from the main power line by turning OFF the relevant circuit breaker located on the electric switchboard.

Do not replace components or make adjustments inside the unit when the voltage supply is turned ON. Always remove power and discharge to ground a circuit before touching it. Under no circumstances should any person initiate servicing or repairing the unit except in the presence of a qualified person.

Ensure unobstructed access to all operator panels, controls, and relevant switchgear cabinets in order to enable instant response to alarms.

Whenever it is necessary to disconnect the waveguide from a radar transmitter for maintenance purpose, the transmitter output should be terminated with a matched load. If this is not possible, care should be taken. Do not stand in front of an open-ended waveguide from which power is being radiated.

→ ***Note:*** Main power is always present on the terminal board unless the main break from the power distribution panel of the vessel is turned off.

⚠ Warning: Never look down a waveguide from which power is being radiated!

Warnings

High voltage

Radar equipment includes high voltage that can cause injury or loss of life. Danger exists only when the units are opened, exposing internal circuits, as when servicing the equipment.

This radar has been carefully designed to protect personnel from possible injury from high voltages. Although every effort has been made to eliminate danger to personnel, no responsibility is accepted for any injury or loss of life suffered in connection with this equipment.

Radio frequency radiation

Harmful effects (particularly to the eyes) may be caused by exposure of any part of the human body to high power radio frequency radiation.

However, the system is designed to always disable the microwave radiation when the antenna is not rotating.

Hazard distances

Configuration	Distance 100 W/m^2 point (m)	Distance 50 W/m^2 point (m)	Distance 10 W/m^2 point (m)
12 KW Transceiver 6' X-band Antenna	-	0.15	0.6
12 KW Transceiver 9' X-band Antenna	-	-	0.5
12 KW Transceiver 12' X-band Antenna	-	-	0.35
25 KW Transceiver 6' X-band Antenna	0.1	0.2	1.3
25 KW Transceiver 9' X-band Antenna	-	0.1	1.0
25 KW Transceiver 12' X-band Antenna	-	0.05	0.9
30 KW Transceiver 12' S-band Antenna	-	-	0.9
HALO 5000 Series	0.8	0.11	2.5

X-Ray radiation

This radar system does not generate X-ray radiation.

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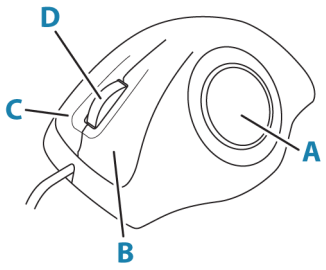
1 Operating the system

A remote control and mouse are used together to operate the system. The O2000 remote controller and R5000 trackball mouse are used together. Alternatively, the R5000 expanded keyboard with integrated trackball can be used to operate the system.

The remote controller is used for menu operation, and for easy operation of the quick access buttons.

The mouse is mainly used for managing targets, and in situations where it is required to position the cursor accurately on the PPI.

O5000 trackball mouse keys



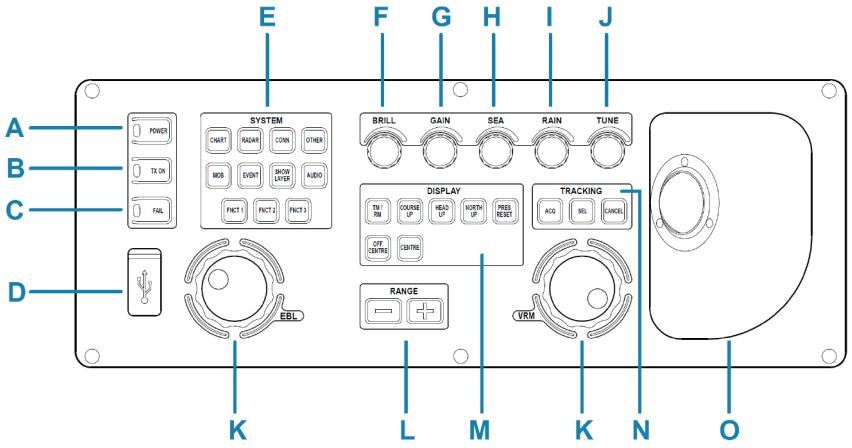
The optical trackball (**A**) is used for positioning the cursor. The other mouse keys have different functionality depending on the position of the cursor on the radar panel.

The following table lists the key functions relative to the part of the radar panel that is under the cursor.

→ ***Note:*** The cursor must be located over an open menu or over the quick access pop-up to be able to use the scroll function.

Cursor over ...	Left key (B)	Right key (C)	Scroll wheel (D)
Menu	Select	Return to previous menu level	• Rotate to scroll menu options • Press to select
Quick access button	Select	Display selected button's pop-up	• Rotate to scroll pop-up options
AIS target	Activate/deactivate	Display target menu	No action
Radar target	Acquire target		

Expanded keyboard controls and indicators

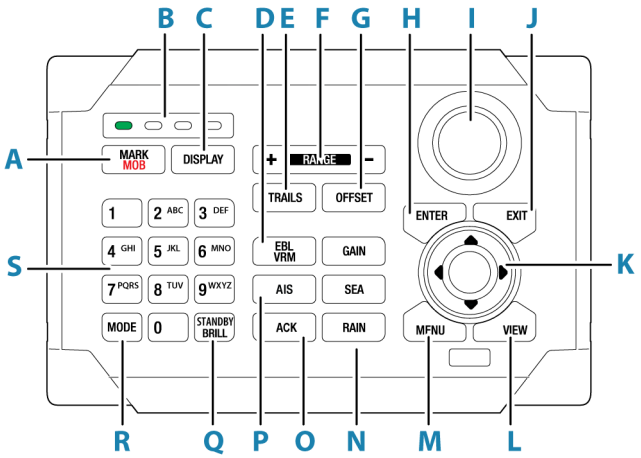


→ ***Note:*** The expanded keyboard can be used with different equipment. As noted below, some of the keys are not applicable for the R5000.

Ref.	Control or indicator	Description and function
A	**POWER**	This pushbutton with green LED indicator is used to switch between Sleep and On conditions. When the system is in Sleep condition it appears to be Off, but the electronic is still on, waiting for the real On condition request. In order to switch on the monitor, and the control panel, the operator has to press the POWER button, and holding it pressed for more than 5 seconds. An audible beep will sound and the green LED next to the pushbutton will change to high brilliance. In "On" condition, by pressing the POWER button again, the monitor, and the control panel will be switched off again and another beep will sound and the green LED will return to low brilliance, bringing the system into a Sleep mode (to shut down the system completely, the main power switch must be set to the off position).
B	**TX ON**	This pushbutton is used to switch the system between Standby and TX ON. In Standby the display does not request the TXRX to transmit, but it is possible to get some information from the system, depending on the type of TXRX connected. In TX ON the radar (if Master) radiates and the antenna turns. This is the normal working condition (the switching "Standby to TX ON" and "TX ON to Standby" are executed at the release of the pushbutton).
C	**FAIL**	This indicator is normally Off. A red-colored LED will be switched on when a system failure occurs (this is an indicator, not a button).
D	USB port	USB type 2.0 for file sharing and software upgrades.
E	**SYSTEM:**	
	System keys	EVENT. Press and hold 5 seconds to create a screenshot. SHOW LAYER = AIS ON/OFF. AUDIO = Temporary AUDIO alarm OFF.
		CHART = Unsupported key RADAR = Unsupported key CONN = Unsupported key OTHER = Unsupported key MOB = Unsupported key
	FNCT 1,2,3	Momentary pushbuttons used to apply one of the first three programmable User Settings (FNCT 1, 2, 3) as described in "" on page 0 .
F	**BRILL**	Monitor and keyboard dimmer. Push to toggle Day/Night.

Ref.	Control or indicator	Description and function
G	**GAIN**	GAIN control. Push to toggle Manual/Auto modes. The optimum setting is when the receiver background noise is hardly visible. For further details, refer to *"Gain"* on page 0 .
H	**SEA**	Sea anti-clutter control. Push to toggle Manual/Auto modes. The optimum setting is when the sea clutter is seen as small dots and small targets become distinguishable around the ship. For further details, refer to *"Sea anti-clutter"* on page 0 .
I	**RAIN**	Rain anti-clutter. Push to toggle Manual/Auto modes. Rain or snow clutter can be reduced by the use of the potentiometer, and covered target revealed. For more details, refer to *"Rain anti-clutter"* on page 0 .
J	**TUNE**	SRT LAN: Push for 2 seconds to toggle between Manual/Auto modes. If manual, keep it pressed to change the tuning. The tuning may be checked by means of the numeric indicator on the screen, or directly by observing a target echo. In the last case, the echo level should be slightly above the noise level (not saturated). The tuning meter indication is displayed on long pulse only. For more details, refer to *"Tuning the radar sensor"* on page 0 .
		HALO 5000: Tuning is not used with HALO 5000 radars.
K	**EBL/VRM**	Use the rotary knob to set the EBL/VRM 1 or 2 alternatively. The EBL/VRM data are displayed in the related windows.
L	**RANGE**	Two momentary pushbuttons used to select one of the 13 different range scales, expressed in NM, and the relevant range rings for PPI presentation.
M	**DISPLAY:**	
	TM/RM	Toggles True Motion and Relative Motion modes.
	COURSE UP	Momentary pushbutton used to select a stabilized Course Up presentation. Press again in Course Up mode to enter a new course reference.
	HEAD UP	Momentary pushbutton used to select Head Up presentation (referred to Heading Line).
	NORTH UP	Momentary pushbutton used to select North Up presentation (referred to Gyro North).
	PRESS RESET	Momentary pushbutton used to reset the position of own ship 180° against the course.
	OFF CENTRE	Momentary pushbutton used to set the off-centered presentation on the point under the cursor of the trackball (if the cursor is placed inside the PPI).
	CENTRE	Momentary pushbutton used to set the PPI centered presentation. Not active in True Motion presentation.
N	**Tracking:**	
	ACQ(UIRE)	Momentary pushbutton used to acquire a radar target or to activate an AIS target.
	SEL(ECT)	Momentary pushbutton used to display alphanumeric information related to the selected radar target or AIS.
	CANCEL	Momentary pushbutton used to delete a tracked radar target or to deactivate an AIS target.
O	**TRACKBALL**	Positioning input device. Use the trackball to move the cursor on the PPI (displayed as a cross) and on the system data area (menus area, displayed as a black arrow, except for the progress bars in which it is possible to change the value, where it's displayed as a double horizontal thin arrow.

O2000 controls



→ ***Note:*** The O2000 can be used with different equipment. As noted below, some of the keys are not applicable for the R5000.

A Mark/MOB key. Not used for R5000

B Unit under command LEDs. Not used for R5000

C Display key. Used for configuration of the O2000. Not used for operating the R5000

D EBL/VRM key. Press once to toggle EBL/VRM markers On/Off. Re-press to display the EBL/VRM pop-up. Press and hold to toggle between EBL/VRM 1 and EBL/VRM 2.

E Trails key. Press to toggle trails ON/OFF.

F Range key. Press the + or the - indication to increase or decrease the radar range

G Offset key. Press once to display the Offset menu

H Enter key. No cursor on PPI: no action. Cursor on PPI: press to activate/deactivate AIS, press and hold to display the targets menu.
Menu operation: press to select an option

I Rotary knob. With no menu active: behavior depending on operational mode.
Menu operation: rotate to scroll through menu items and to adjust values, press to select or to save settings

J Exit key. With no menu active: clear the cursor from the PPI. Menu operation: press to return to previous menu level or to exit a dialog

K Arrow keys. With no menu active: press to move the cursor on the radar PPI.
Menu operation: press to move through menu items and to adjust a value

L View key. Press once to display the View menu

M Menu key. Press once to display the Main menu

N Gain, Sea, and Rain keys. Press to set radar sensitivity

O Acknowledge key. Press once to acknowledge the most recent alarm or warning in the Alerts panel. Press the key again to acknowledge the next alarm or warning. Press and hold to bring the focus on the Alerts panel without acknowledging the most recent alarm

P AIS key. Press to activate/deactivate AIS information on screen. Press and hold to display the Vessels dialog

Q Standby/Brilliance key. Press once to display the Standby/Brightness pop-up. Press twice to toggle between Standby and Transmit. Press and hold to switch the radar system ON/OFF.

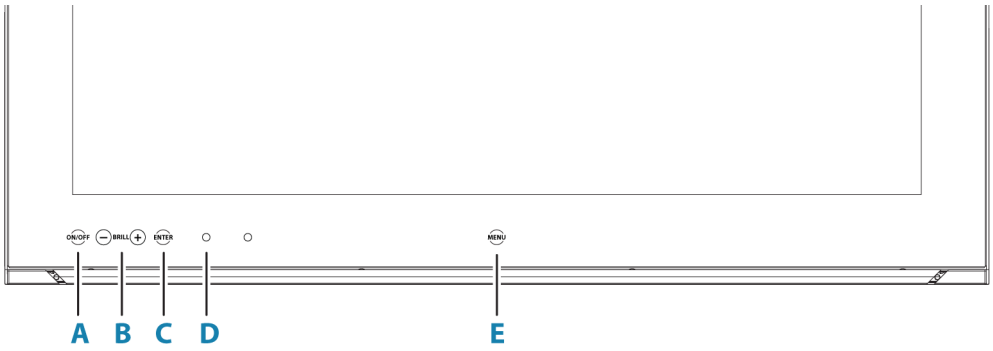
R Mode key. Not used for R5000

S Alpha numeric keypad. Used for entering numbers or text in dialog boxes. With no menu active: press a key to modify the range as shown below:

	1	2	3	4	5	6	7	8	9	0
NM	1/8	1/4	1/2	3/4	1.5	3	6	12	24	48

M5000 monitor keys

The monitor is configured and controlled using the row of touch sensitive buttons along the lower edge of the monitor frame. All buttons are backlit - only the power button is illuminated when the monitor is turned off.



A **Power key**

- With OSD (On Screen Display) menu active: press to return to previous menu level
- With no OSD menu action: no action

B **Brilliance adjustment key**

- Press plus/minus key to decrease/increase brightness (no on-screen display of brightness level)
- Simultaneously press and hold both keys to reset the brightness level to default value. The default value is set in the OSD menu
- With OSD menu active: press plus/minus key to move focus up/down in the menu

C **Enter key**

- With OSD menu active: press to confirm a selection
- With no OSD menu active: no action

D **Red LED**

- Solid on: standby mode, or no video source
- Flashing: monitor booting or upgrading

E **Menu key**

- Press and hold to activate the OSD menu

For more information, refer to the separate documentation for the monitor.

2 Basic operation

Turning the system ON and OFF

Turning ON

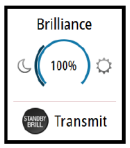
Turn the system ON by pressing the STANDBY/BRILL key using the O2000, or pressing the POWER button using the expanded keyboard.

The system will be ON as long as power is connected.

Switching the system to standby mode

Press and hold the STANDBY/BRILL key using the O2000, or press the POWER button using the Expanded keyboard to turn the R5000 radar processor and the monitor to standby mode. The radar sensor is turned into standby mode only if R5000 is controlling it (connected as master). If it is in slave/clone mode, the sensor will continue transmitting.

Adjusting display brightness



The brilliance is adjusted with the from the brilliance pop-up.

- Use the O2000 to display the pop-up by pressing the standby/brilliance key, then adjust the display brilliance by turning the rotary knob.
- Turn the BRILL knob on the expanded keyboard to adjust the brilliance.

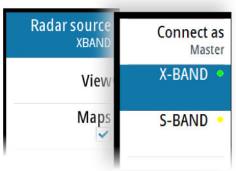
At first start-up, the display brilliance is set to 100%. When the unit is restarted, the brilliance is automatically set to the level it was prior to switching the unit off.

The system includes a day and a night color palette. When the brilliance is set to 40% or lower, the system switches to use the night palette.

- With the pop-up open, switch between the day and night palette by pressing the left (40%) or right (100%) arrow keys.
- Switch between day and night palette on the expanded keyboard by pressing the BRILL knob.

Close the pop-up by pressing the exit key.

Selecting radar source



More than one radar sensor can be connected to the radar system.

Select the active radar sensor from the menu.

Switching the sensor between transmit and standby mode

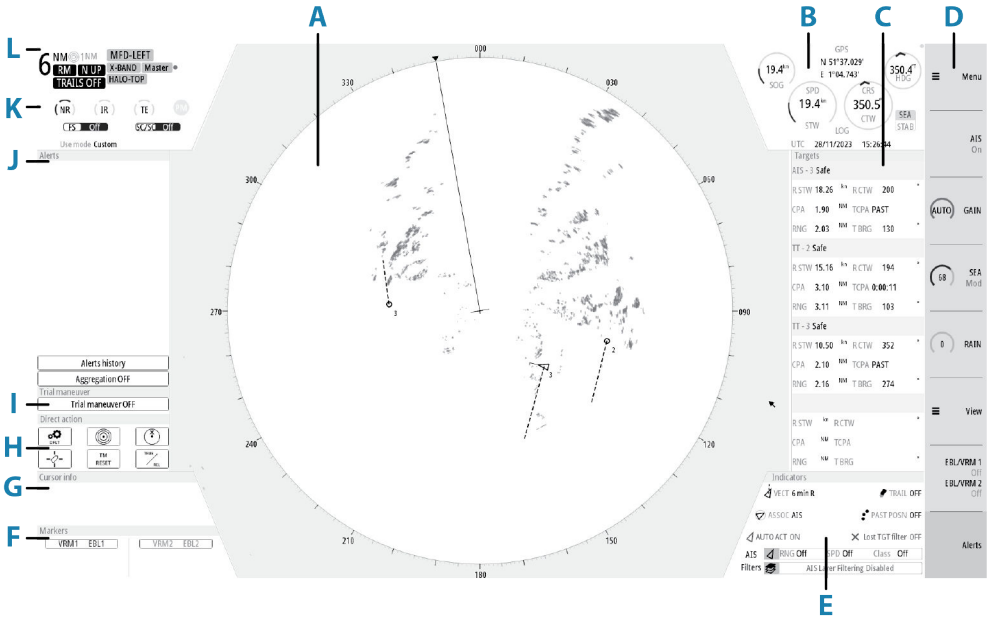
You switch between transmit and standby mode when the brilliance pop-up is displayed.

- Display the pop-up by pressing the standby/brilliance key on the O2000, then repeat short presses on the key to switch between standby and transmit mode
- Press the TX ON button on the Expanded keyboard to switch between standby and transmit mode

3 The user interface

Main panel

The main panel is divided into predefined areas as shown in the figure below.



A **Plan Position Indicator (PPI)**
Radar video area where all tracking and navigation options are performed.

B **Own ship information**
Stabilization mode indicator, picture freeze indicator and gauges showing primary and secondary sensors.

C **Target panel**
Detailed information about selected targets and AIS targets.

D **Quick access buttons**
Dedicated buttons for main function.

E **Target indicators**
Overview of target indicator settings.

F **Markers**
Details for active VRM and EBL markers.

G **Cursor information**
Range and bearing from the vessel to the cursor position. Also including position information if a position source is available.

H **Direct actions**
Dedicated buttons for direct actions.

I **Trial maneuver button**
Trial maneuver immediate action.

J **Alerts panel**
List of all active alerts.

K **Signal indicators**
Gauges for signal processing and indicators for radar functions.

L **System information**
Range, mode, band indication, and pulse details.

Picture freeze indicator



The image includes a picture freeze indicator (**A**). The small dot blinks at an interval of 1 second to show that the screen is alive and that information from sensors is updated.

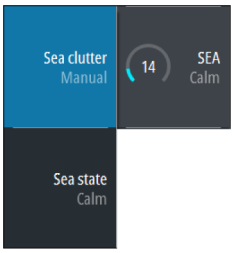
If the picture freezes the unit needs to be restarted.

Quick access buttons

The quick access buttons are activated from the dedicated keys on the controller, or by using the mouse to select the button.

More details about the quick access buttons are available in the separate sections describing the functions later in this manual.

Quick access pop-ups



Some of the quick access buttons have additional functions, presented as a pop-up.

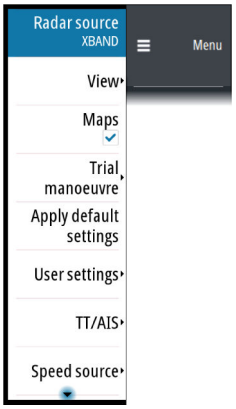
To display the pop-up:

- Double-press the dedicated key on the controller
- Press the right mouse key when the cursor is over a selected quick access button

To remove the pop-up and revert to the button's main function:

- Press the exit key on O2000
- Press the left mouse key when the cursor is outside the pop-up
- Press the right mouse key when the cursor is over the pop-up

Main menu and submenus



You access the main menu by pressing the menu key, or by selecting the quick access menu button.

To operate the menu with the O2000:

- Press the up and down arrow keys or turn the rotary knob to move up and down in a menu
- Press the enter key, the right arrow key or the rotary knob to access a submenu, to toggle options or to confirm a selection
- Press the exit key or the left arrow key to return to previous menu level and then exit the menu system

Some options display a slider. Turn the rotary knob or press the up/down arrow keys to adjust the value.

To use the trackball mouse to operate the menu:

- Use the scroll wheel to move up and down in a menu
- Use the left key to access a submenu, to toggle options or to confirm a selection
- Use the right key to return to previous menu level and then exit the menu system

→ ***Note:*** The cursor must be located over the menu to operate the menu system.

On-screen keyboard

A numeric or alphanumeric virtual keyboard is displayed when required to enter user information in dialogs.

To enter text:

- Use the arrow keys to locate the cursor over a virtual key, then confirm the selection with enter key
- Select a virtual key with the left mouse key

If the virtual keyboard is inactive for 10 seconds it will automatically close.

Complete the entry and close the dialog by selecting the virtual enter key.

Remove the virtual keyboard without saving by pressing the exit key.

4 System setup

Overview

Prior to use, the system requires a number of settings be configured in order for the system to perform as expected.

Most settings are intended to be configured by the technician commissioning the system, by the operator at first use, or by a technician after servicing or replacement of system parts. Other settings are generic, and the system can be used with default values.

The installation settings are only available in service mode. Refer to *"The settings dialog"* on page 19 and *"Access control"* on page 20.

→ ***Note:*** Before starting the software setup, the system must be wired according to the wiring instructions. All system units must be powered on. The O5000 Trackball or expanded keyboard must be connected. All sensors must be available. At least one transceiver must be assigned to one control station in the priority table. Refer to *"Priorities table"* on page 36

All the areas listed must be addressed during commissioning, and they should be stepped through in the listed sequence.

When the setup is completed, the R5000 processor must be restarted. Refer to *"Reboot device"* on page 22.

The settings are split between:

- control station settings: need to be done for each of the control stations in a multi-station installation
- shared settings: can be done from any control station in the system

NMEA 0183® equivalence with IEC 61162-450

This device uses the term NMEA 0183® in menus and dialogs. NMEA 0183® is equivalent with the IEC standard IEC 61162-450.

Control station settings

Control station settings are local settings for the control station. They need to be repeated for each of the control stations in a multi-station installation.

1	O2000 configuration	*"Configuring the O2000"* on page 20
2	Setting up the NMEA 0183® ports	*"NMEA 0183® setup"* on page 39
3	Selecting sources	*"Sources"* on page 35
4	LWE Own configuration	*"LWE Own configuration"* on page 40

Shared settings

The settings listed are shared for the complete radar installation. These can be done from any control station in the system.

1	Radar settings	
	• Radar sensor installation settings	*"Radar installation"* on page 23
2	Own ship settings	
	• Own ship setup	*"Own ship setup"* on page 43
	• Own ship's AIS MMSI number	*"MMSI"* on page 43
	• Trial maneuver setup	*"Trial maneuver settings"* on page 44
3	Control station settings	

	• Control station names	*"Control display units"* on page 35
	• Control stations priority	*"Priorities table"* on page 36

Introduction to Lightweight Ethernet

Lightweight Ethernet (LWE), defined by IEC61162-450, is a protocol defined to enable an Ethernet connection between multiple talkers and multiple listeners, using the messages defined in IEC61162-1/2. LWE is an IP-based implementation, making use of a multicast address and corresponding User Datagram Protocol (UDP) port for transmission. LWE is essentially a means to share data between units over Ethernet.

There are some restrictions on the connection of LWE networks:

- The different components are connected through an Ethernet switch, and connection to a router or repeater hubs are not allowed
- No multicast filtering is configured

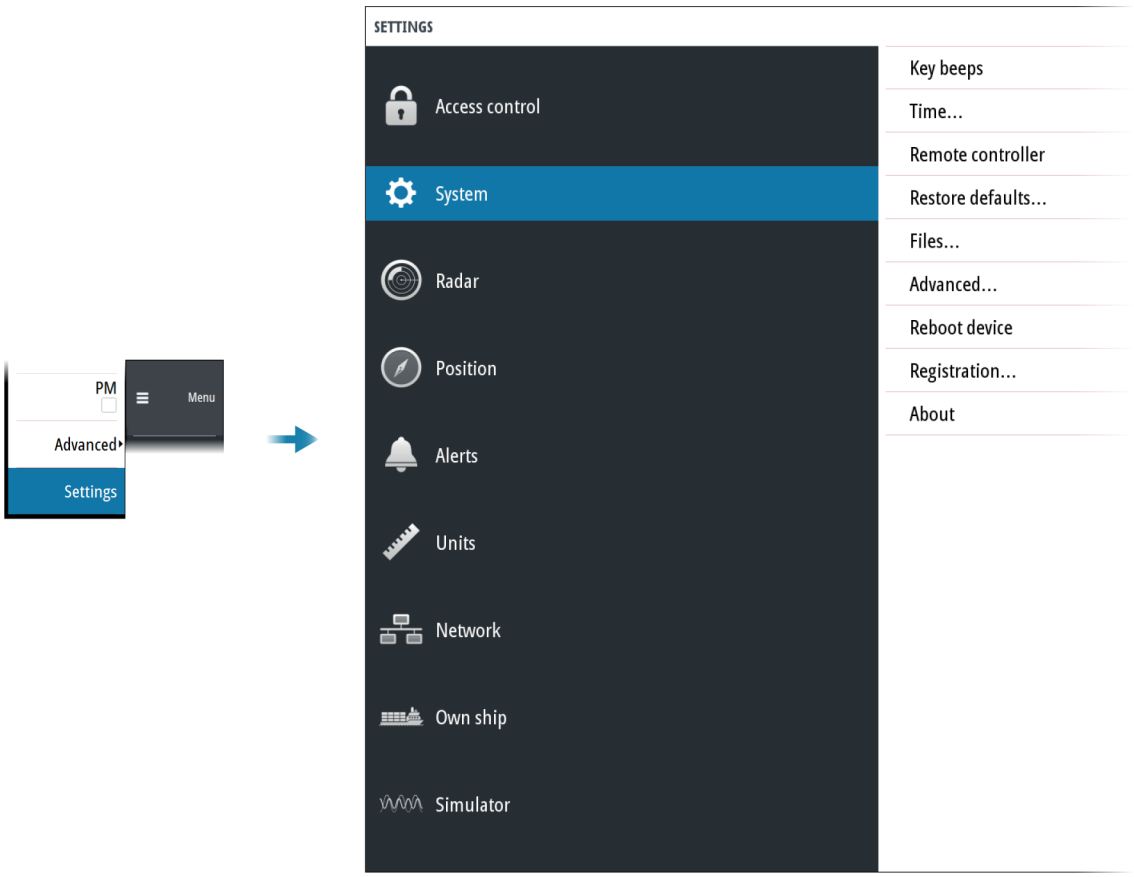
Equipment on the network that performs system functions can transmit and receive information. Each System Function (SF) is identified by a System Function Identifier (**SFI**) which is unique on any boat network.

→ ***Note:*** If no SFI is entered (remaining with the default 9999 value), the device will not be visible on the LWE network, and it will not share any data.

Every device that is a part of the LWE network shall be assigned an IP address (10.0.0.1 to 10.255.255.253 or 192.168.0.1 to 192.168.255.254). This IP address is to be chosen as a unique address for every device on the boat network.

The settings dialog

The system setup is done from the settings dialog.



Access control

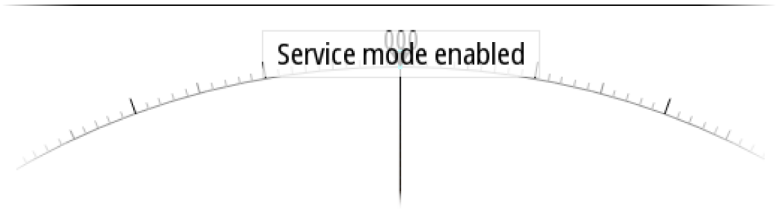
Some of the parameters in the settings dialogs are intended for system setup and service engineers. These parameters are protected, and they are only available by entering the password **QWERTY**.

When the password is entered, service mode is enabled and all settings are accessible.



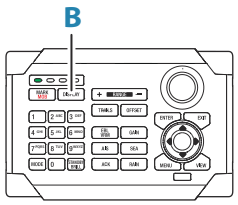
> ⚠ Warning: When in service mode, there is no timeout for the settings dialogs, and the acoustic alert is disabled. Do not use the radar in service mode during normal navigation.

Service mode is indicated on the radar PPI.



Service mode remains active until it is manually closed, or until the R5000 processor is restarted or switched to standby mode.

Configuring the O2000



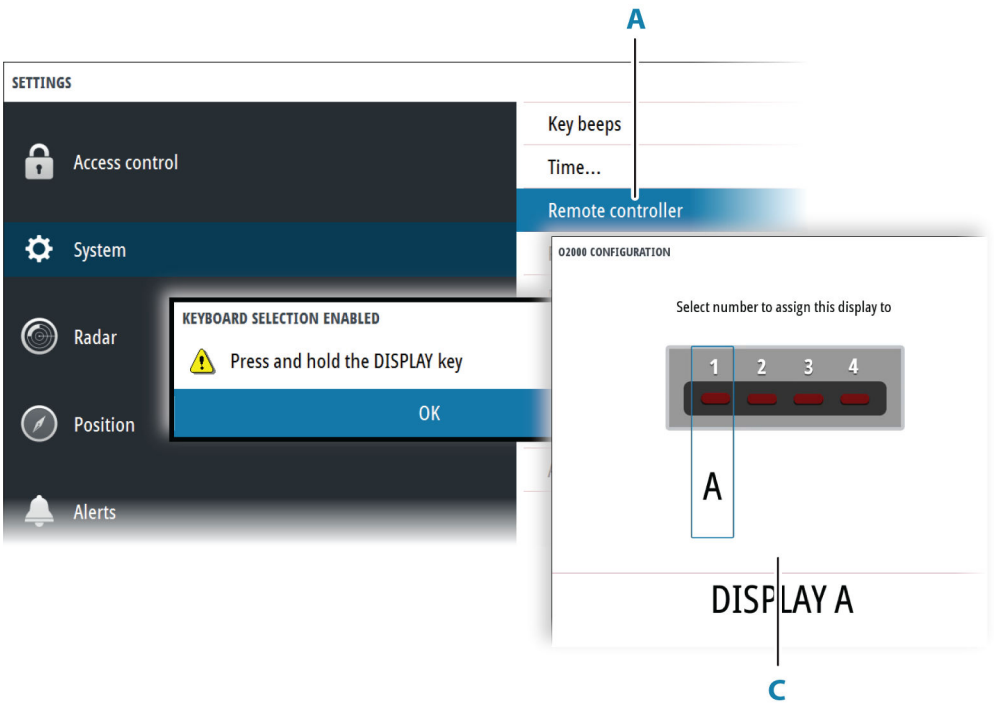
The O2000 controller has to be assigned to a radar control station before it can be used.

All LEDs on the O2000 controller are red when the unit is in unconfigured or in configuration mode.

You assign and unassign an O2000 controller from the O2000 configuration dialog.

To activate the O2000 configuration dialog:

- Select the remote keyboard option from the settings dialog (**A**), then press and hold the display key (**B**) on the O2000 controller until the O2000 configuration dialog (**C**) is displayed



→ ***Note:*** The display key on the O2000 controller is only used for configuration. The behavior described in the O2000 User manual is not relevant when used in an R5000 system.

Assigning the O2000 to a control station

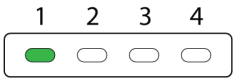
With the O2000 configuration dialog open:

1. Press the 1, 2, 3 or 4 key on the O2000 to assign the radar control station to LED position 1, 2, 3 or 4 respectively

→ ***Note:*** By default, a radar station is assigned to LED position 1. Other LED positions might be used in a multiple radar installation where the LED can be used to indicate the location (left to right) of the radar control station.

2. Select the assign button (**A**) to confirm your selection and to exit configuration mode





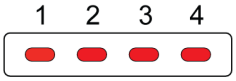
The assigned LED on the O2000 is now green to indicate that the unit is assigned to operate the connected radar control station.

Un-assigning the O2000 control unit

With the O2000 configuration dialog open:

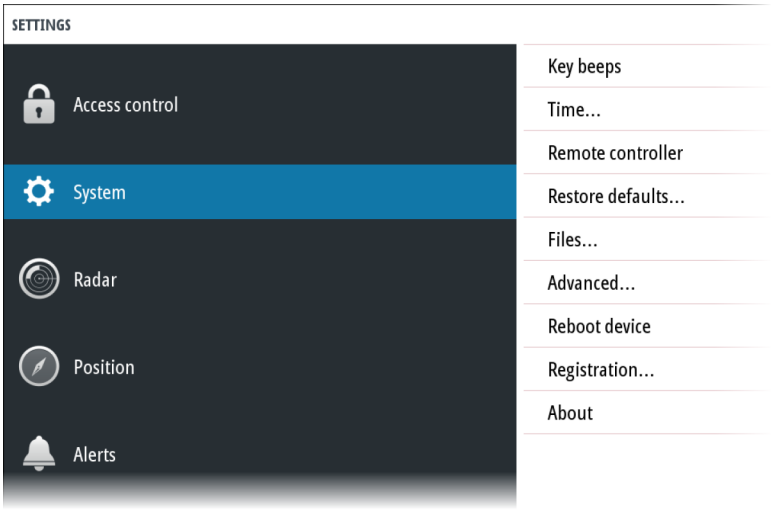
1. Press the 1, 2, 3 or 4 key on the O2000 controller to select the assigned LED position
2. Select the un-assign button (**B**) to un-assign the O2000 and to exit configuration mode





All LEDs on the O2000 are now red to indicate that the unit is not assigned to operate any radar control station.

System settings



Key beeps

Controls the loudness of the beep sound that occurs when physical interaction is made with the unit.

Time

Configure time settings to suit vessel location, along with time and date formats.

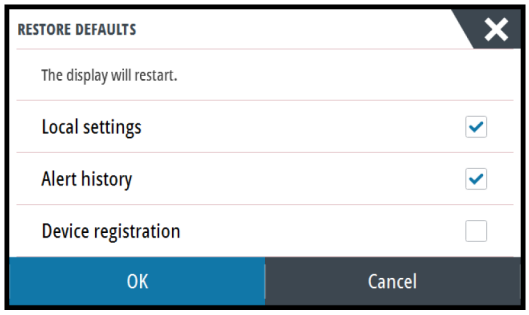
Remote controller

Used for configuring the O2000 remote controller.

See details in *"Configuring the O2000"* on page 20.

Restore defaults

Restores selected settings to default factory values.



Files

File management system. Used to display selected content of the unit for export, and to browse storage devices connected to the unit.

Advanced

Used for detailed configuration of the user interface.

Reboot device

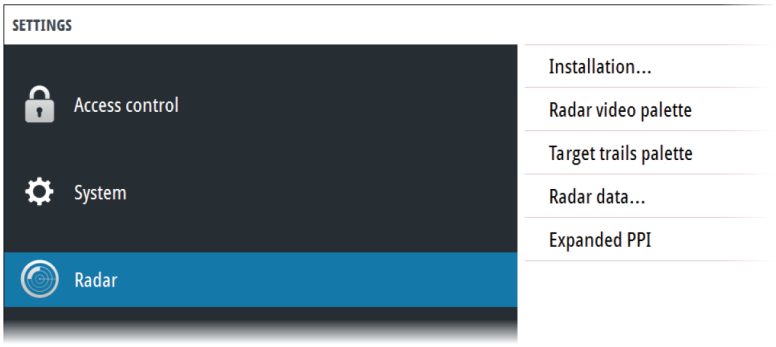
Used for rebooting the R5000 processor.

When this option is selected, the R5000 processor restarts and the radar sensor is switched to standby mode. Other units in the radar system remains on.

Registration
Guides you how to register your device.

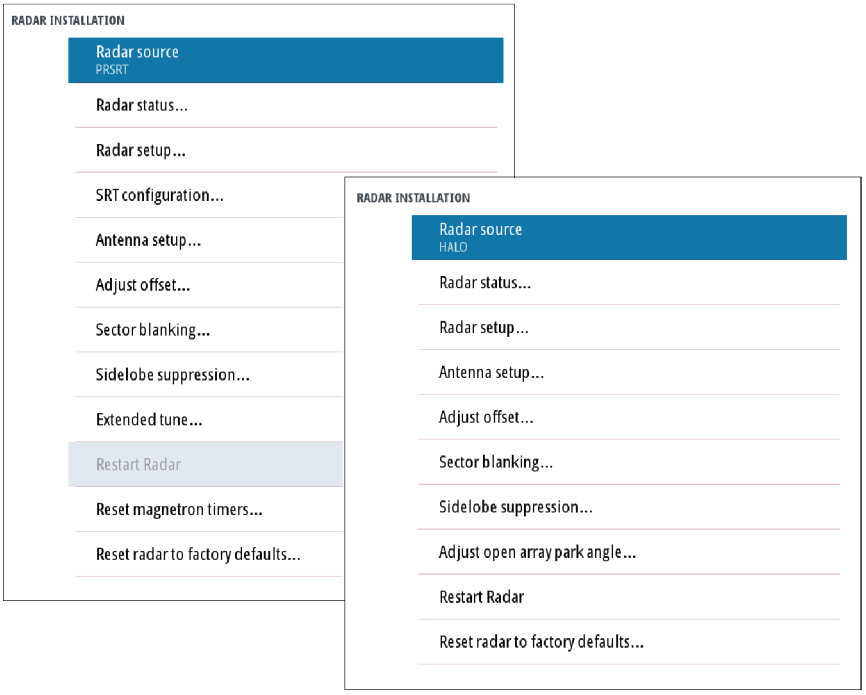
About
Displays copyright information, software version, and technical information for this unit.

Radar settings



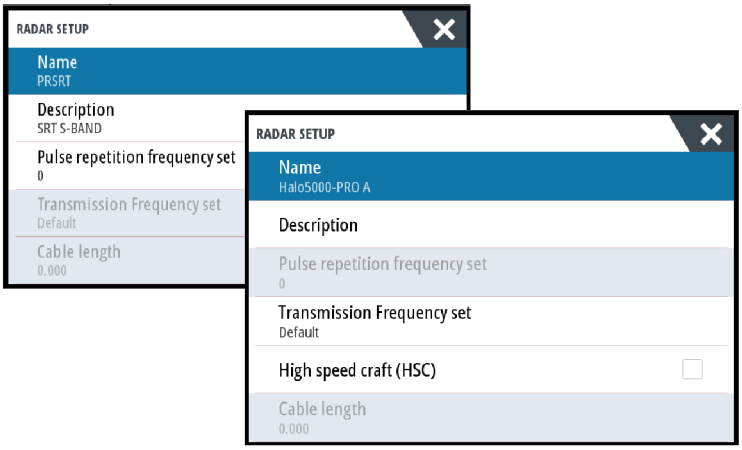
Radar installation
The radar system requires radar sensor specific settings in order to adjust for a number of variables found in different installations.

→ ***Note:*** The installation settings available depends on the radar type and model.



Radar source
In a system with more than one radar sensor, the device to configure is selected from this menu.

Radar setup
Used for defining the radar sensor details.



Sensor name

Name of the radar sensor. The name is used to identify the radar sensor. The name is displayed in the PPI center when no video signal is present and in several other tables and Menu dialogs.

The text length is limited to maximum 10 characters.

Sensor description

Allows for more detailed description that could be useful to distinguish a radar sensor from other radar sensors.

The text length is limited to maximum 250 characters.

If the information is added, the first 30 characters are shown on PPI when no video signal is present.

Pulse repetition frequency set

Used to avoid interference between SRT LAN radars working on the same band.

If the PRF is set to 1, the pulse repetition frequency is shifted so that it does not interfere with other radar sensors with PRF set to 0.

Transmission frequency set

Used to avoid interference between HALO 5000 radars working on the same band.

If the transmission frequency is set to alternative, the transmission frequency is shifted so that it does not interfere with other radar sensors with transmission frequency set to Default.

High speed craft (HSC)

Must be selected when vessel complies with the SOLAS definition of high speed craft.

Note: This option is only available for HALO 5000 radar.

Cable length

Used for inserting the length of the waveguide/coaxial cable for downmast radar sensors. The value is used to calculate internal parameters for target detection.

→ ***Note:*** This option is only available for SRT LAN down-mast radars.

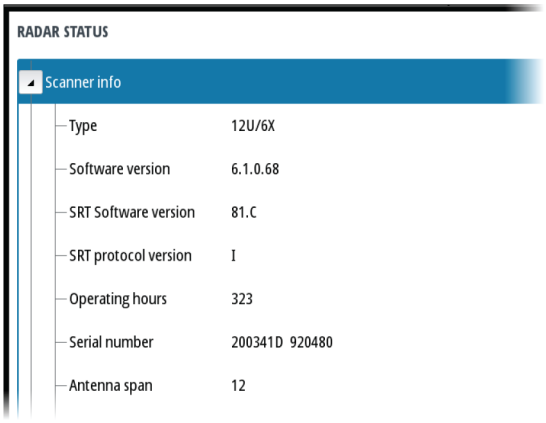
Radar configuration

This part is only for Navico engineers and protected by the factory password.

→ ***Note:*** This option is only available for SRT LAN radars.

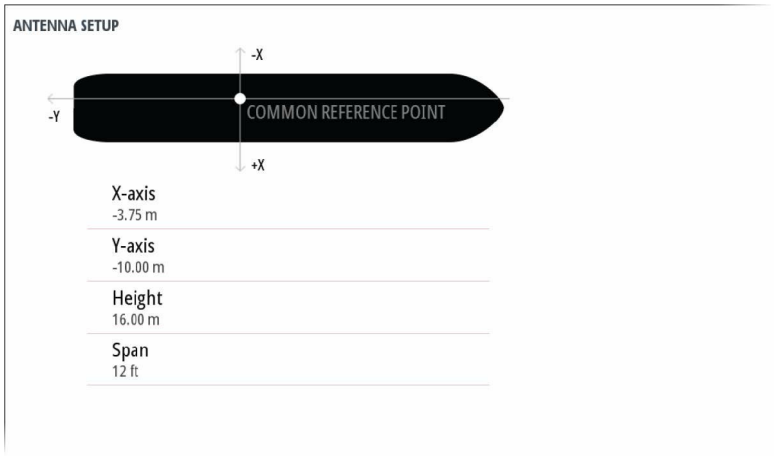
Radar status

Displays scanner information and scanner features, primarily used for information and to assist with fault finding.



Antenna setup

Used for setting the position, height and span of the antenna.



The approximate position of the antenna on the vessel must be set in order to correctly position the vessel outline when viewing close range settings. The PPI will be centered on the icon representing the position of the antenna. Enter the antenna distance, in meters, from the common reference point.

The antenna height is the height of the antenna above the water line, when vessel is carrying a typical load. It is very important to set the antenna height correctly as this will affect the sea clutter function. Enter the antenna height, in meters, above the waterline.

The antenna span is the total length of the antenna. Choose 4, 6, 9, or 12 ft antenna length.

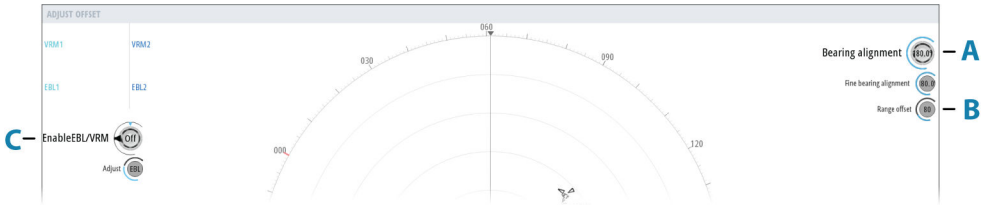
Adjust offset

➔ ***Note:*** Prior to starting the offset adjustment, the gain must be adjusted to give a good image of any echoes that are to be used for the adjustments.

The adjust offset allows for initial tuning of bearing alignment (icon **A**) and for the radar range offset (icon **B**).

➔ ***Note:*** Range offset is only available for SRT LAN radars.

The EBL/VRM markers (**C**) can be used to help improve the adjustments.



To activate and adjust the EBL/VRM (**C**):

1. Left-click the enable EBL/VRM icon to turn the option ON
2. Left-click the adjust icon to switch between EBL and VRM
3. Adjust the EBL/VRM by using the trackball wheel or the rotary knob

To use the adjustment options (**A** and **B**):

1. Left-click the icon to activate the option
2. Adjust the value by using the trackball wheel or the rotary knob

Adjust bearing alignment



This option is used to align the heading marker on the screen with the center line of the vessel. This will compensate for any slight misalignment of the scanner during installation.

Misalignment that is not corrected for will compromise target tracking and can result in dangerous misinterpretation of potential navigation hazards.

1. Point the vessel towards a stationary isolated object, or towards a far range AIS where the AIS icon matches the radar echo
2. Adjust the coarse and fine bearing alignment so that the heading line touches the end of the selected object

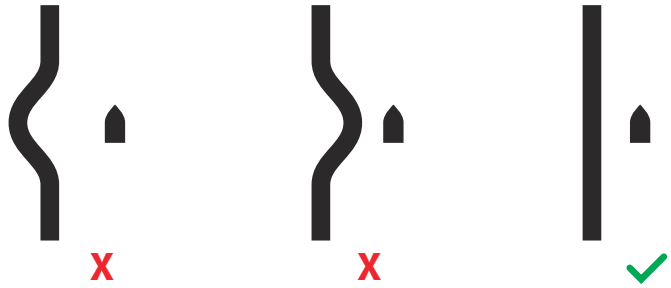
Adjust range offset



The radar sweep should commence at your vessel (a radar range of zero). You may need to adjust the radar range offset to achieve this. If this is set incorrectly, a large dark circle in the center of the sweep might occur. You might notice straight objects such as straight sea walls or piers having curves or an indentation. Objects close to your vessel may appear pulled in or pushed out.

Adjust the range offset as below when the vessel is about 45 to 90 m (50 to 100 yards) from a straight-walled jetty or similar feature that produces a straight line echo on the display.

1. Point the vessel towards the jetty
2. Adjust the range offset to make the jetty echo appear as a straight line on the display

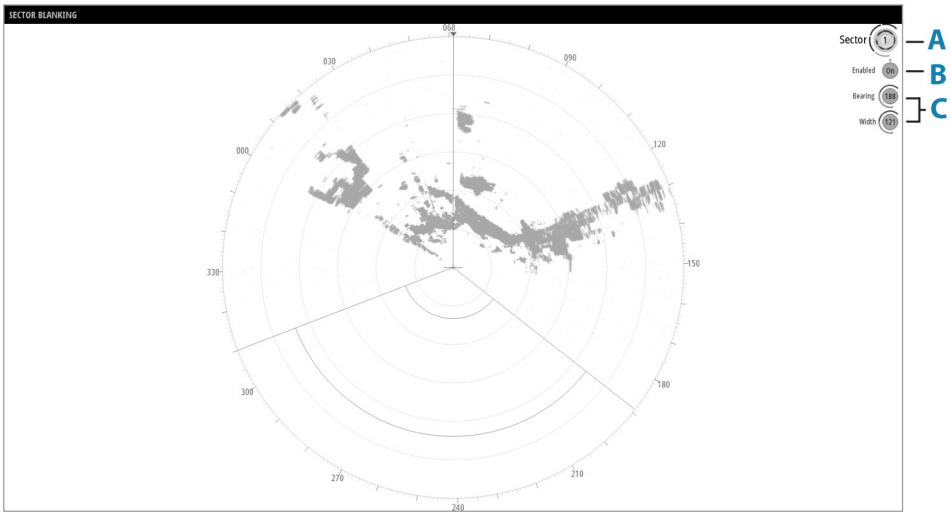


➔ ***Note:*** Fine range offset tuning is possible with a nearby AIS target when the ship outline is presented. Radar echo should be placed above AIS.

Sector blanking

Radar installed in close proximity to a mast or structure could cause unwanted reflections or interference to appear on the radar image. Use the sector blanking feature to stop the radar from transmitting on up to four sectors in the image.

➔ ***Note:*** Sector blanking should be applied very carefully to avoid reducing the radar's usefulness in identifying valid and potentially dangerous targets.



Defining blanking sectors

1. Select the sector you want to create the blanking for (icon **A**)
2. Turn ON the enable option (icon **B**) for the selected sector to display the adjustment icons (**C**)
3. Set the bearing and width for the sector. The bearing is the center line of the sector, relative to the heading line of the radar. 0° is dead ahead.
4. Continue as above defining the remaining sectors.

The settings are saved to temporary memory when you switch between the sectors.

You are asked to save or discard the settings when you exit the blanking sector screen.

Sidelobe suppression

Occasionally false target returns can occur adjacent to strong target returns such as large ships or container ports. This occurs because not all of the transmitted radar energy can be focused into a single beam by the radar antenna, a small amount of energy is transmitted in other directions. This energy is referred to as sidelobe energy and occurs in all radar systems. The returns caused by sidelobes tend to appear as arcs.

➔ ***Note:*** This control should only be adjusted by experienced radar users. Target loss in harbor environments may occur if this control is not adjusted correctly.

When the radar is mounted where there are metallic objects near the radar, sidelobe energy increases because the beam focus is degraded. The increased sidelobe returns can be eliminated using the sidelobe suppression control.

By default, this control is set to auto and normally should not need to be adjusted. However, if there is significant metallic clutter around the radar, sidelobe suppression may need to be increased.

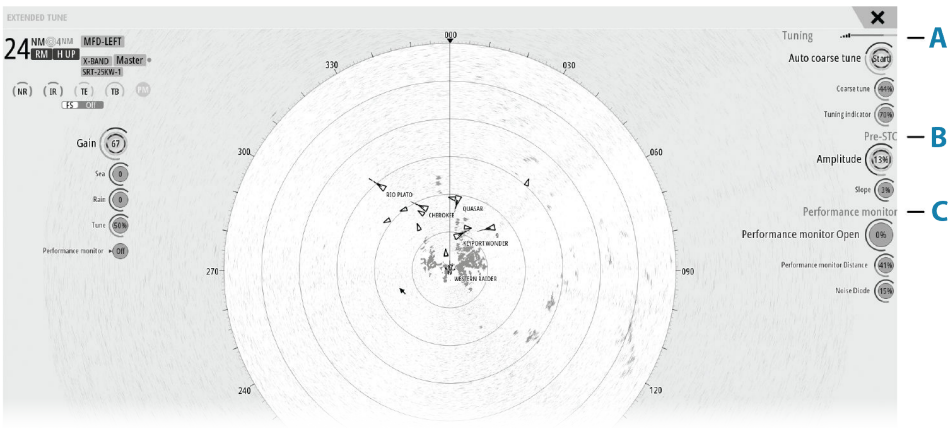
To adjust the sidelobe suppression value:

1. Set radar range to between 1/2 nm to 1 nm and the sidelobe suppression to auto
2. Take the vessel to a location where sidelobe returns are likely to be seen. Typically, this would be near a large ship, container port, or metal bridge.
3. Traverse the area until the strongest sidelobe returns are seen.
4. Change auto sidelobe suppression to OFF, then adjust the sidelobe suppression control just enough to eliminate the sidelobe returns. You may need to monitor 5-10 radar sweeps to be sure they have been eliminated.
5. Traverse the area again and readjust if sidelobes returns still occur.

Extended tune

➔ ***Note:*** Tuning is only available for SRT LAN radars.

The extended tune allows for initial tuning and adjustment of the radar system.



Adjustment options:

- Tuning (**A**)
- Pre-STC (**B**)
- Performance monitor (**C**)

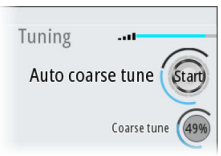
To use the radar controls and the adjustment options:

1 Left-click the icon to activate the option

2 Adjust the value by using the trackball wheel or the rotary knob

Tune adjustments

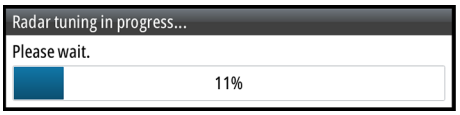
➔ ***Note:*** A waiting period of 20 minutes in standby is necessary for the magnetron to reach the correct operating temperature. After the waiting period, set the radar to transmit and the range to 24 NM before commencing tuning.



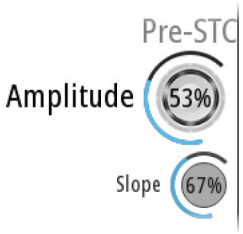
The coarse tune can be automatic or manual.

The automatic tuning will work well in most installations. The manual tuning is used if it is required to adjust the result from an automatic tuning.

When the automatic tuning is selected, a progress bar indicates status. The value is stored automatically when the tuning is completed.



Pre STC



The pre-STC curve has a fixed value that is not to be changed during normal operation.

The value of the STC curve is optimized during testing at the factory, and will usually not require any adjustment after installation.

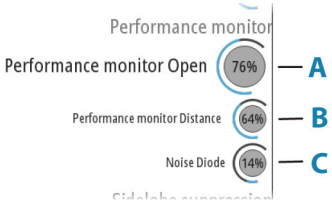
It is possible to change the amplitude and the slope of the pre-STC curve. This adjustment optimizes the minimum visible distance, and it can affect the auto-tuning performance.

> ⚠ Warning: Only highly skilled radar experts should change the pre-STC value. Bad adjustment will compromise target tracking and/or auto tuning of the radar!

Performance monitor SRT LAN

The performance monitor is used to check the output performance of the transceiver. It is very important that it is initially adjusted at time of installation, and when the magnetron is replaced, when power output is still optimal.

Before entering the performance monitor adjustment, ensure that the range rings are turned ON.



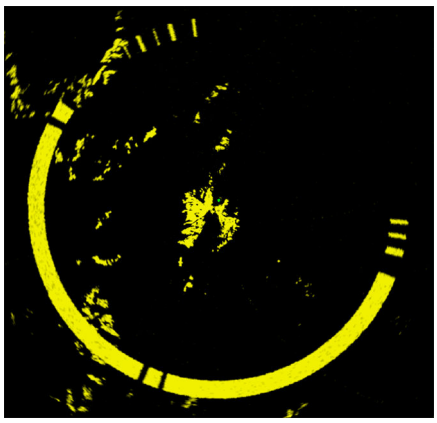
To adjust the performance monitor:

1. Set the range to 36 NM
2. Adjust the gain value manually until you are able to see a light noise background
3. Turn ON the performance monitor image (left side of the image)
4. Adjust the performance monitor distance (**B**) to 50%
5. Adjust the noise level (**C**) until the ring appears clear with little noise
6. Adjust the performance monitor distance (**B**) again until the inner ring is located at 24 NM

→ ***Note:*** There will be a 2-3 scans delay before the ring reaches its final position.

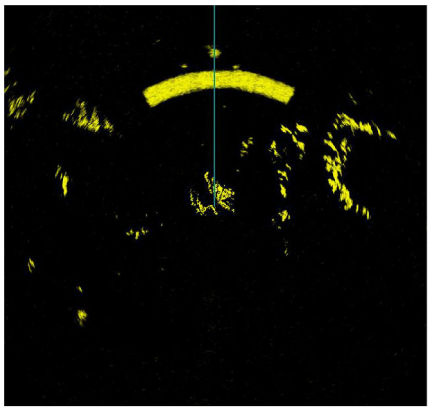
7. Adjust the value of the performance monitor open option (**A**) until the opening width of the displayed noise ring is about 50° - 100° for X-band radars, or 180° for S-band radars

→ ***Note:*** In some cases, numerous metallic objects near the antenna, such as masts, funnels, and superstructure, may result in increased interruptions and a less distinct arc. This is due to RF energy reflecting off of these objects.



Performance monitor (HALO 5000 radar)

The performance monitor on the HALO 5000 series has no user adjustments other than choosing the antenna size. The radar calculates any eventual loss of performance, and the relative warning is displayed when the performance monitor is enabled.



The performance monitor is started from the main menu.

The operator can check the performance monitor ring displayed at 24 NM +- 30° to each side of the zero bearing reference. The ring will disappear if the receive path has a loss greater than 10 dB.

Radar performance is calculated in every condition regardless of the video processing selected. To get a clear picture of the noise ring, the gain should be set to standard or auto value, and the remaining sea/rain processing controls should be disabled.

The ring visibility is not affected by sea clutter and only partially when strong land and rain clutter are present at 24 NM.

Sector blanking within the +- 30° can affect the transmitted power. Sector blanking should not be inserted within the +- 30° or disabled when the performance monitor is enabled.

→ ***Note:*** The performance monitor antenna should always be pointed toward a transmission area without metal obstructions requiring sector blanking.

⚠ Warning: Weather conditions with rain precipitation rates more than 166 mm/h can temporarily affect the performance monitor. Rain drop accumulation on both antennas can show a loss greater than 10 dB.

Adjust open array park angle

→ ***Note:*** Reset magnetron timers is only available for SRT LAN radars.

The park angle is the final resting position of the antenna relative to the heading line of the radar when the radar is set to standby. The antenna will stop rotating at the desired offset.

Reset magnetron timers

→ ***Note:*** Reset magnetron timers is only available for SRT LAN radars.

The timers count the number of hours the magnetron has been transmitting, the pulse length, and the pulse repetition frequency (PRF). The dialog also shows end of life status (which reports OK or FAIL).

When the magnetron is replaced with a new item the timers of the transceiver must be reset.

Restart radar

Note: Restart radar is only available for HALO 5000 radars.

Used to restart the HALO 5000 radar program. When this option is selected, the R5000 will lose the radar sensor until the reboot is completed. Other units in the radar system remain on.

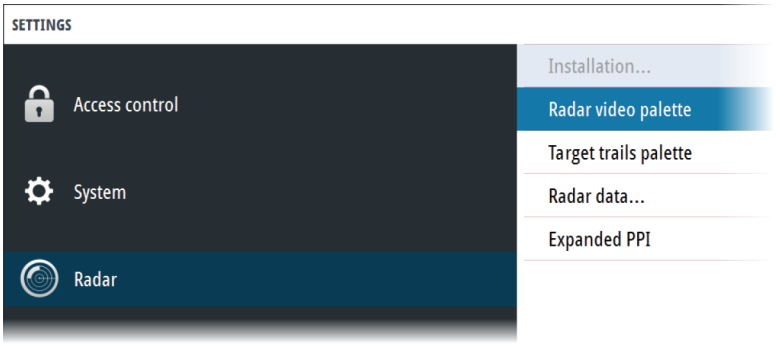
Reset radar to factory defaults

Clears all user and installer settings applied to the selected radar source, and restores factory settings.

→ ***Note:*** Use this option with caution. Take note of current settings first, especially those set by the operator if radar has already been in active service.

Radar video palettes

Different palettes are available for the radar video and for the target trails.

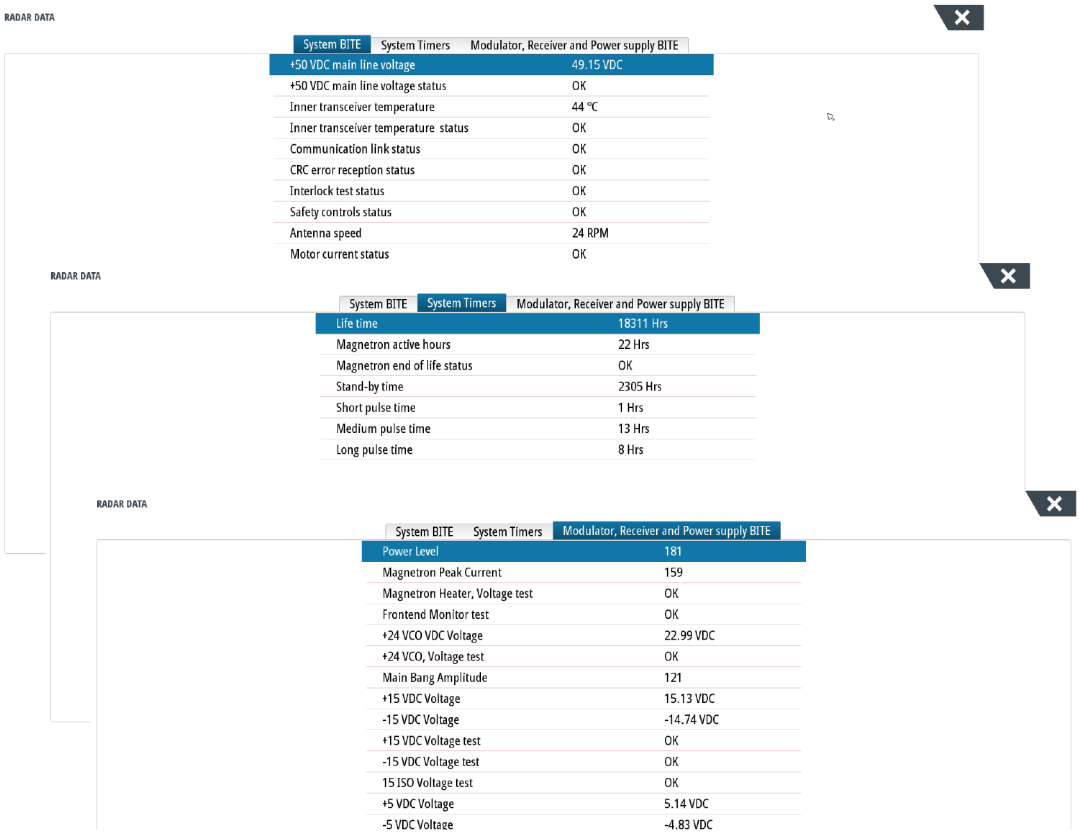


Radar data

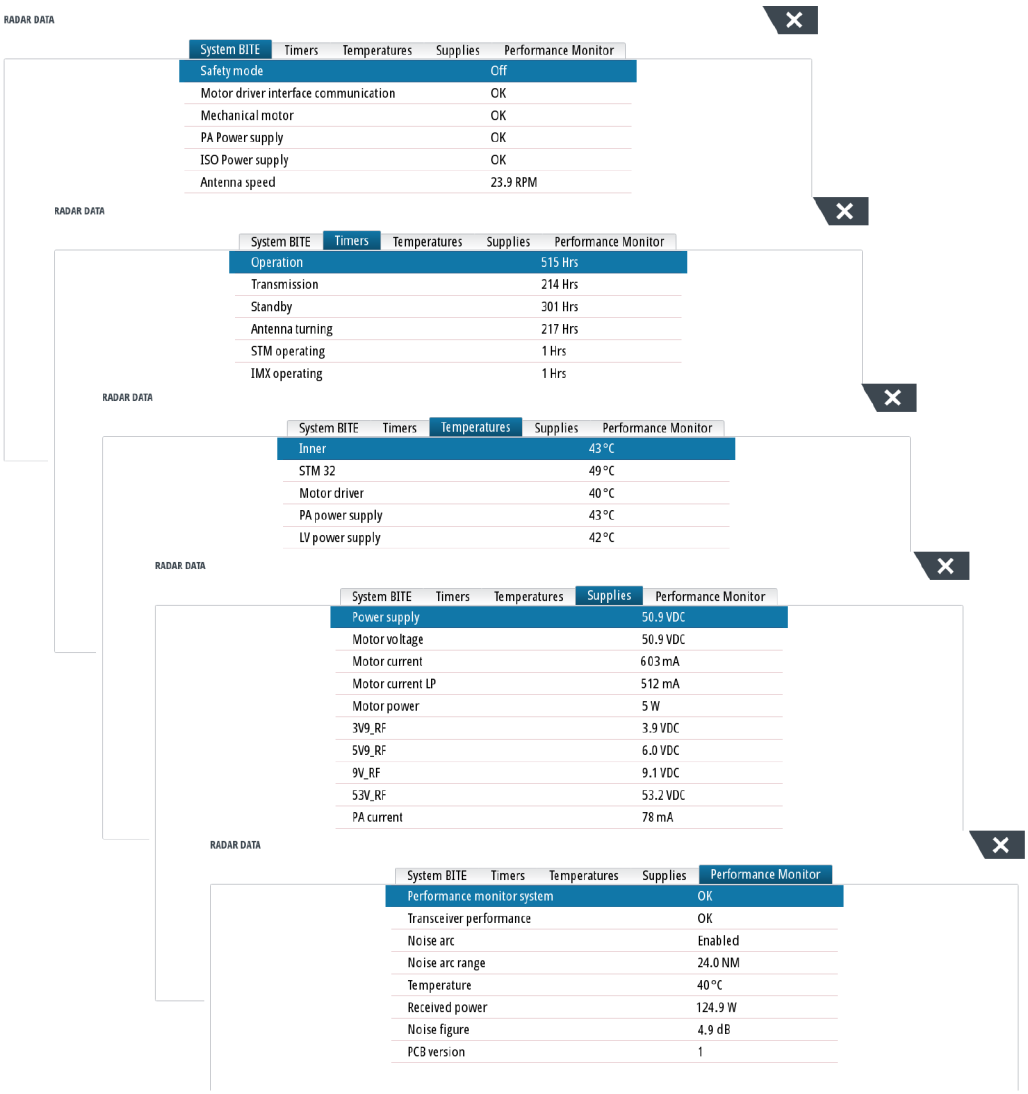
Displays status for vital radar components.

→ ***Note:*** The radar data menus available depends on the radar sensor.

SRT LAN Radar data



HALO 5000 Radar data



Expanded PPI

With this option selected, the radar video outside the bearing scale is visible as a shaded image. Targets, VRM and Range rings are not visible in the expanded PPI area.

Position settings



Satellites

Displays a graphical view and numeric values for available satellites.

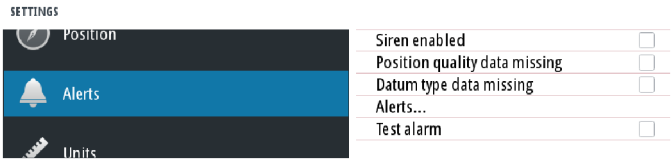
From within this dialog you can select and configure the active GPS sensor.

Ignore position quality

Allows using EPFS sensors with legacy NMEA® messages.

Without this option activated the system will not consider these legacy EPFS sensors. Data will be ignored and a speed log error alarm will be raised.

Alerts settings



Siren enabled

By default, the audible alert signal is turned ON.

You can select to disable the audible signal when service mode is active, but the audible signal will be enabled when service mode is deactivated.

Position quality data missing

Disables the position quality data monitor.

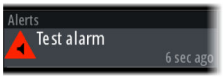
Datum type data missing

Disables the datum data monitor.

Alerts

Displays a list of all active and historical alerts with time stamp.

Test alarm



Tests the alert indicator and audible signal. When it is ON an alert starts to sound and the Test alarm appears on the Alerts panel. It can be acknowledged but remains on the panel until it is turned OFF in the settings menu.

Units of measure settings



By default, speed measurements are in knots (kn), and large range measurements are in nautical miles (NM). These settings cannot be changed.

For distances below 0.125 NM you can select to show the distance in meters.

By default, Own vessel rate of turn units in the trial maneuver settings are degrees per minute (°/min), optionally you can select to use degrees per second (°/s).

→ ***Note:*** Units of measurements can only be changed when the connected antenna is in standby mode.

Network settings



NMEA 0183® equivalence with IEC 61162-450

This device uses the term NMEA 0183® in menus and dialogs. NMEA 0183® is equivalent with the IEC standard IEC 61162-450.

Info

Displays the Ethernet connection status, the unit's IP and MAC addresses.

Control display units

Displays a list of control display units on the network.

A control display unit is identified by the serial number of its R5000 radar processor.

The serial numbers are added automatically for all R5000 radar processors on the Interswitch network. If you need to add some units which are offline, the serial number must be entered manually.

It is recommended to change the device name to ease the identification of the control stations.

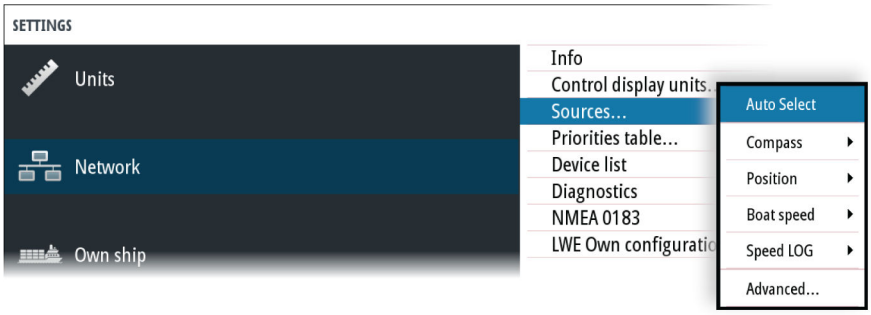
Sources

Data sources provide live data to the system.

When a device is connected to more than one source providing the same data, the user can choose the preferred source. Before commencing with source selection make sure all external devices and networks are connected and turned on.

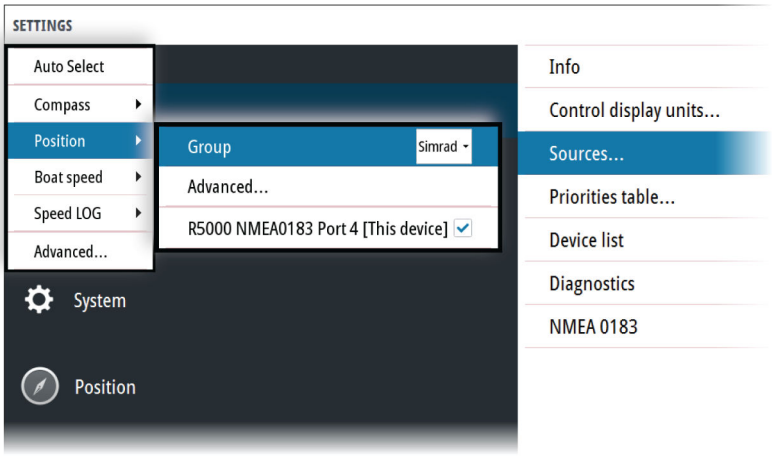
Auto Select

The Auto Select option looks for all sources connected to the device. If more than one source is available for each data type, selection is made from an internal priority list. This option is suitable for the majority of installations.



Manual source selection

Manual selection is generally only required where there is more than one source for the same data, and the automatically selected source is not the one desired.



Group source selection

This option does not affect the system. All devices in the network use sources independently.

Advanced

Detailed configuration option for the selected device.

Advanced source selection

This allows the most flexible and precise manual control over which devices provide data.

Occasionally auto select might not assign the desired source, which can be corrected using the advanced source selection.

Priorities table

Used for defining the priority of the control stations for a radar sensor.

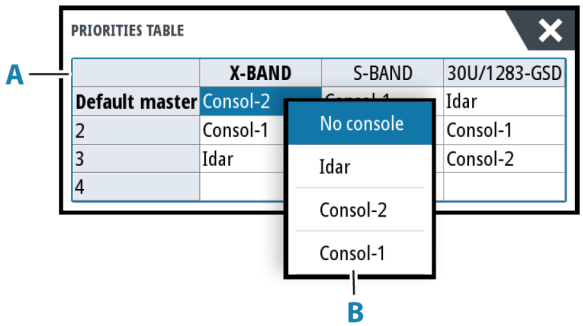
The priority can be assigned to all control stations that are registered in the list of control stations. Refer to *"Control display units"* on page 35.

The priority configuration can be done from any control station on the Interswitch network, also with other control stations being offline. Once a control station is available on the Interswitch network, the settings will be synchronized and accessible.

Assigning the control station priority

The priorities table list all available radar sensors (**A**). The name is defined as described in the *"Sensor name"* on page 24.

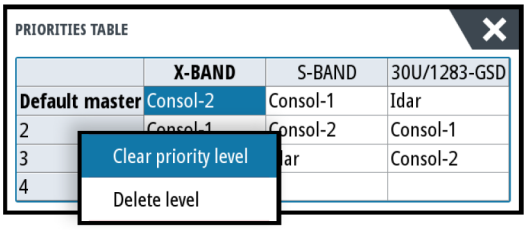
Right-click a cell, or press the enter key when the cursor is over a cell, to display the list of available control stations (**B**). The control station name is defined as described in the *"Control display units"* on page 35.



1. Define the default master for each radar sensor. The control station that is directly wired to the radar sensor should be set as the radar sensor's default master
2. Define a priority for each control station that shall be allowed to control each of the radar sensors

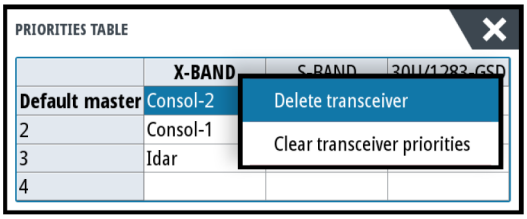
Remove a priority level

A priority level can be removed by right-clicking the greyed area for that priority.



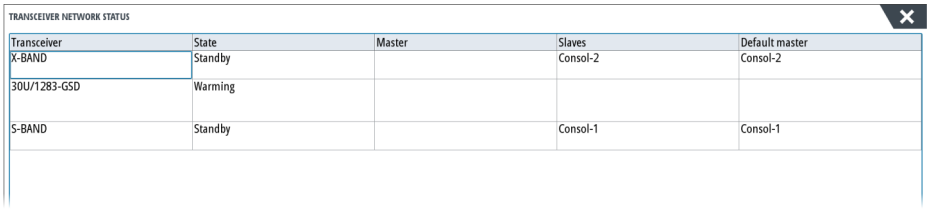
Remove sensor or sensor priorities

Right-click the greyed area including the sensor name to remove all priorities for a radar sensor, or to remove the radar sensor from the list



Sensors network status dialog

The sensors network status dialog displays a list of all radar sensors available on the Interswitch network.



Device list

Selecting a device in this list will bring up additional details and options for the device.

All devices allow allocation of an instance number in the configure option. Set unique instance numbers on any identical devices on the network to allow the unit to distinguish between them. The data option shows all data being output by the device.

→ ***Note:*** In most cases, setting the instance number on a 3rd party product is not possible.

→ ***Note:*** The device list only shows NMEA 2000® devices, not Ethernet.

Diagnostics

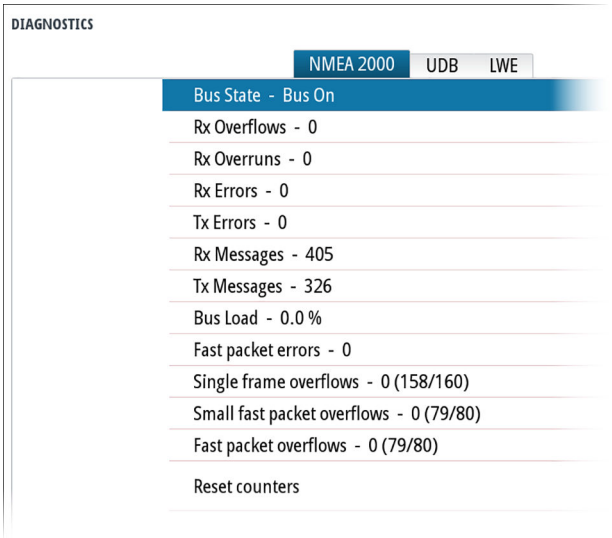
Provides information useful for identifying an issue with the network.

NMEA 2000®

Provides information on NMEA 2000®-bus activity.

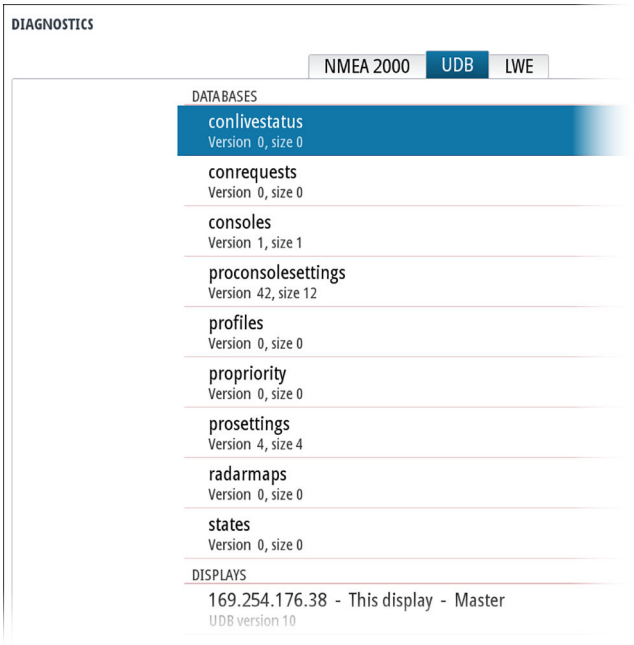
→ ***Note:*** The following information might not always indicate an issue that can be simply resolved with minor adjustment to network layout or connected devices and their activity on the network. However, Rx and Tx errors are most likely indicating issues with the physical network, which can be resolved by correcting termination, reducing backbone or drop lengths, or reducing the number of network nodes (devices).

→ ***Note:*** NMEA 2000® is only used for the connection of the O2000 control.


DIAGNOSTICS
NMEA 2000
UDB
LWE
Bus State - Bus On
Rx Overflows - 0
Rx Overruns - 0
Rx Errors - 0
Tx Errors - 0
Rx Messages - 405
Tx Messages - 326
Bus Load - 0.0 %
Fast packet errors - 0
Single frame overflows - 0 (158/160)
Small fast packet overflows - 0 (79/80)
Fast packet overflows - 0 (79/80)
Reset counters

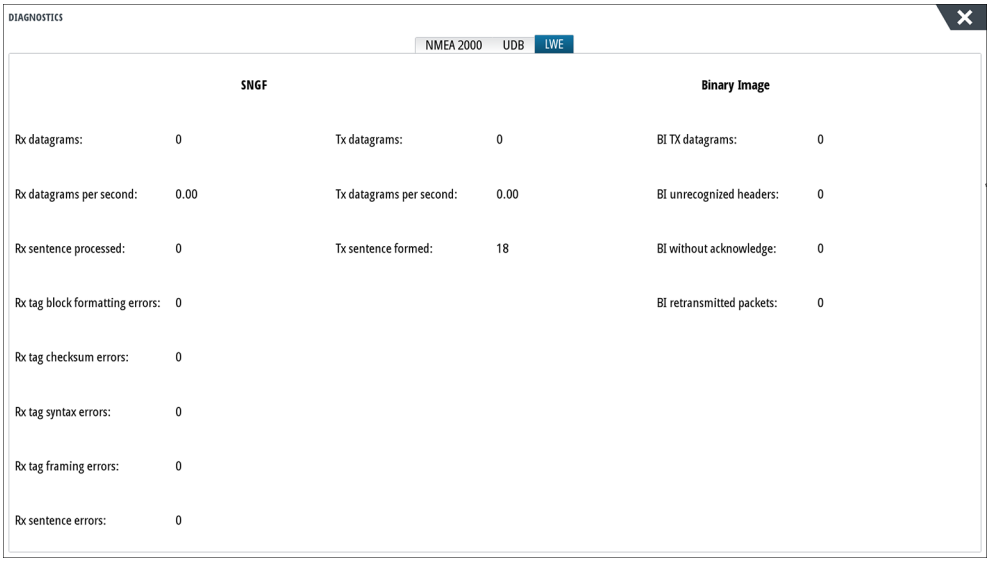
UDB

Provides information on Ethernet activity.



LWE

Provides information on LWE activity.



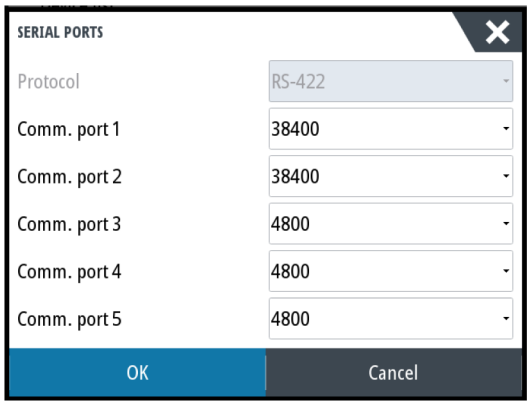
NMEA 0183® setup

The NMEA 0183® port(s) must be set to suit the speed of connected devices, and can be configured to output only the sentences required by listening devices.

Serial ports

Specifies the baud rate for the devices connected to each of the NMEA 0183® ports. The baud rate should be set to correspond with devices connected to NMEA 0183® input and output.

→ ***Note:*** The baud rate change is applied only after rebooting the system.

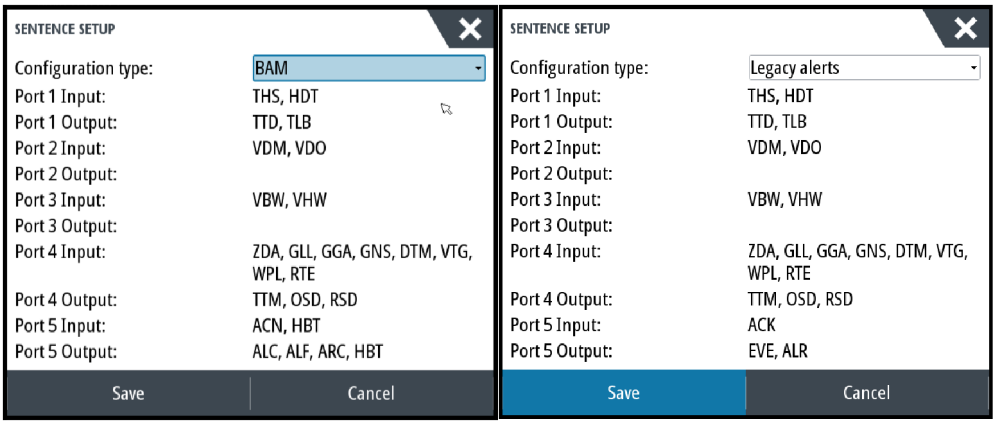


Serial sentences

The system can be configured to the following modes:

- BAM - select to communicate with an external Bridge Alert Management system conforming to IEC 61924-2
- Legacy alerts (default mode) - select to communicate with a legacy BAM, using ALR and ACK sentences

Each mode has pre-defined sentences for all ports.



BAM *Legacy alerts*

LWE Own configuration

Managed switch configuration

When using a managed switch to connect the radar to LWE Ethernet, configure the managed switch first. Refer to the managed switch installation guide available at www.navico-commercial.com.

This device

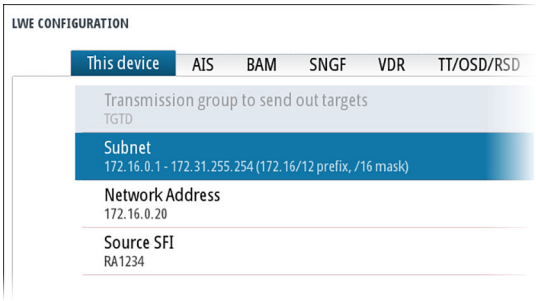
Used to identify this device on the LWE network.

The Ethernet must be assigned with:

- A subnet range.
- An IPv4 address. It must be in the range of between 10.0.0.1 to 10.255.255.253, or 172.16.0.1 to 172.31.255.254, or 192.168.0.1 to 192.168.255.254, according to the subnet selected. The IP address must be unique for each device on the network.

- A 4 digit Lightweight Ethernet SFI (System Function ID). The SFI must be unique for each device on the network.

➔ ***Note:*** If no SFI is entered (remaining with the default 9999 value), the device will not be visible on the LWE network, and it will not share any data.

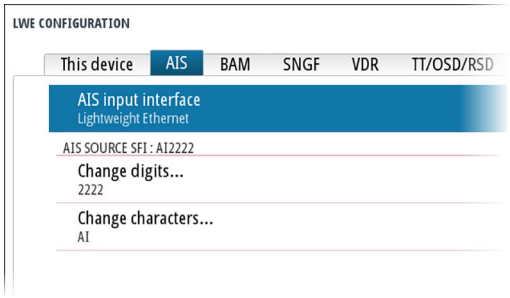


AIS

Used to identify the AIS device on the LWE network. The system can be configured to receive the communication from AIS via LWE instead of serial line.

The AIS source SFI must be assigned with:

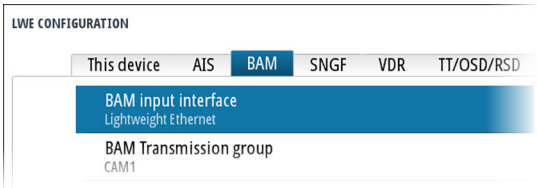
- A 4 digit Lightweight Ethernet of the SFI (System Function ID).
- A 2 character (talker identifier) of the SFI (System Function ID).



BAM

Used to identify the BAM device on the LWE network. The system can be configured to establish the communication with BAM via LWE instead of serial line.

Select the proper transmission group as per BAM or CAM network configuration. The radar talker identifier prefix of the SFI is **RA**.



Serial to Network Gateway Function (SNGF)

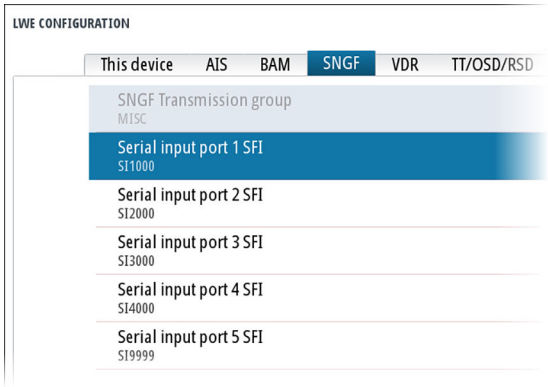
The serial input ports can be configured and bridged to LWE network.

Each device must be configured with:

- A 4 digit Lightweight Ethernet of the SFI (System Function ID).

The transmission group is **MISC** and the radar talker identifier prefix of the SFI is always **SI**.

➔ ***Note:*** If no SFI is entered (remaining with the default 9999 value), the device will not be visible on the LWE network, and it will not share any data. The SNGF mirrors any type of messages received without filtering or checking for corrupt messages.



VDR

Used to identify the VDR device on the LWE network. The system can be configured to establish the communication with VDR via LWE.

The VDR source SFI must be assigned with:

- A 4 digit Lightweight Ethernet of the SFI (System Function ID).
- A 2 character (talker identifier) of the SFI (System Function ID).

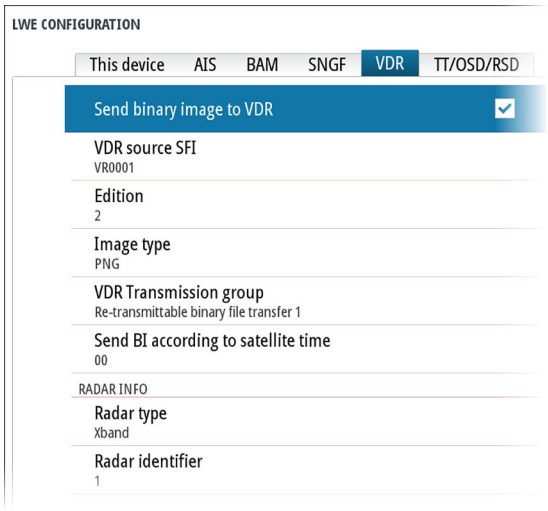
Select the edition 2 or the legacy edition 1 of the LWE communication protocol.

Select the type of the Binary Image to be transferred to VDR.

Select the proper transmission group as per VDR network configuration.

Enter the Binary Image transmission time (between 00 and 14) to the VDR. If adding 00 the BI will be transmitted every 15 seconds at 00, 15, 45 of the UTC seconds.

Enter the radar type and radar identifier number.

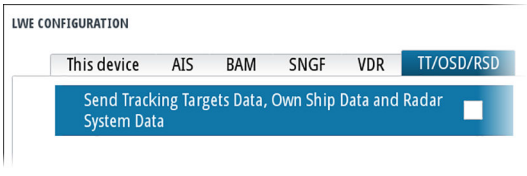


TT/OSD/RSD

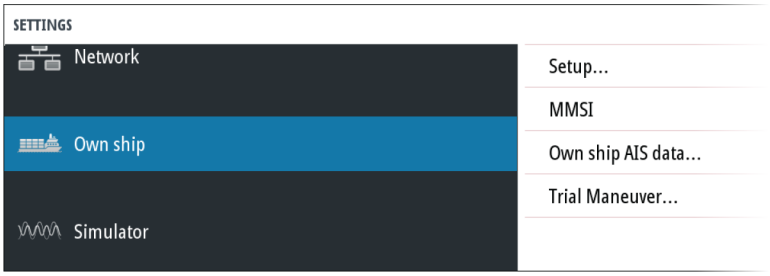
Check the box to enable the transmission of the tracking target data, own-ship data and radar system data to LWE network.

The radar talker identifier prefix of the SFI is **RA** and the transmission groups are:

- **TGTD** for the tracking data.
- **NAVD** for own-ship data and radar system data.

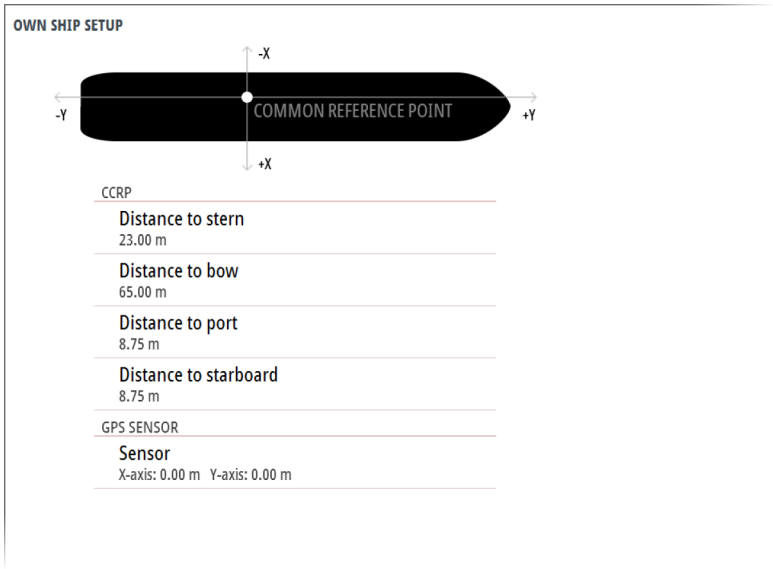


Own ship



Own ship setup

This dialog is used for defining the CCRP and the GPS sensor position.



- CCRP
  - Sets the approximate location for the common reference point. This is the ship's bridge and location of the radar operator. With the radar antenna position also defined, the radar can calculate the bearing and distance of radar targets relative to the CCRP.
- GPS Sensor
  - Sets the approximate location for the primary GPS position sensor. This is relevant to correct positioning of AIS targets on the PPI. The position is entered relative to the CCRP.

MMSI

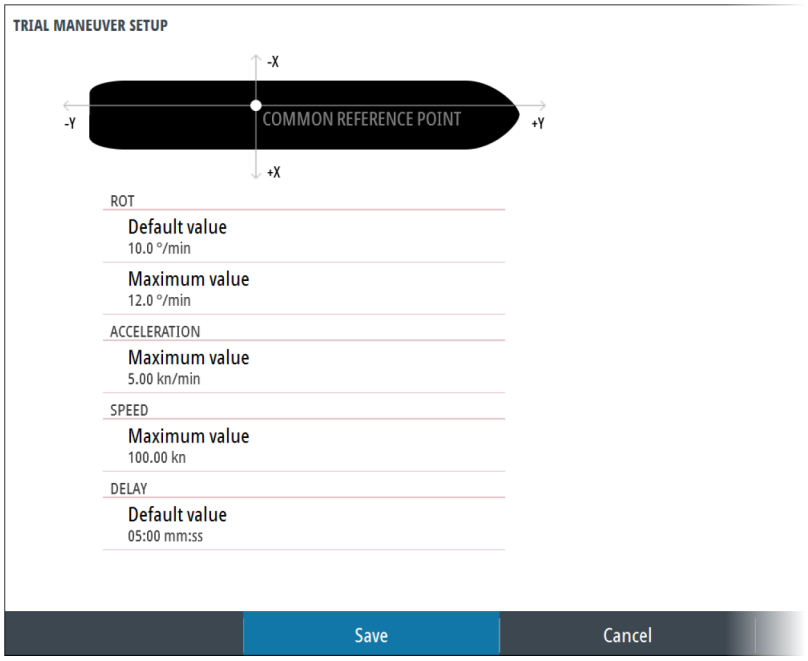
Used for entering your own MMSI (Maritime Mobile Service Identity) number into the system. You need to have this number entered to receive addressed messages from AIS and DSC vessels. You also need to have your MMSI number entered to avoid seeing your own vessel as an AIS target.

Own ship AIS data

Displays the data received from own vessel's AIS system.

Trial maneuver settings

Used for defining the default values and limitations for the trial maneuver.



5 Simulator

Introduction

The simulation feature lets you see how the unit works without being connected to sensors or other devices.



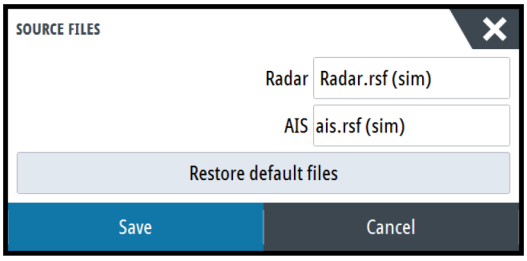
Demo mode

In this mode the unit displays the main features of the product.

→ ***Note:*** Demo mode is designed for retail/showroom demonstrations.

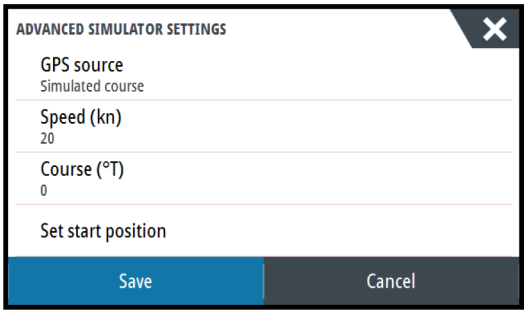
Simulator source files

You can select which data files that are used by the simulator. It can be either pre-recorded data files included in your device, your own recorded log files, or log files on a mass storage device connected to the unit.



Advanced simulator settings

The advanced simulator settings allows for manually controlling the simulator.



GPS source

Selects the file for the simulated GPS data.

Speed and Course

Used for manually entering values when GPS source is set to Simulated course. Otherwise, GPS data including speed and course come from the selected source file.

Set start position

Allows you to enter coordinates for simulated vessel position.

➔ ***Note:*** This option is only available when the GPS source is set to simulated course.

6 Menu overview

Main menu

> Access submenu

... Open dialog

Level 1	Level 2
Radar source	
View >	Trials & PAST POSN >
	Orientation
	Motion mode
	Reset offset
	Offset >
	Vectors >
	Cursor bearing
	Brilliance >
	Own ship outline
	Route data page
Maps	
Trial maneuver >	Current speed
	Final speed
	Current course
	Final course
	Rate of turn
	Direction
	Delay >
	Start
	Reset
Apply default settings	
User settings >	Save settings >
	Load settings >
TT/AIS >	
	Cancel all
	Cancel selected target
	Lost warning
	Range
	CPA/TCPA limit ...
	AIS >
	Data ...
	Target ASSOC >
	Training
Speed source >	Stabilization
	Source
	Manual speed

Level 1	Level 2
	Drift/Set
	Drift
	Set
PPI symbols >	PI lines >
	Maps ...
	Range rings
	Heading line
	Overlay graphic off
PI1 BRG Reset	
PI2 BRG Reset	
PI3 BRG Reset	
PI4 BRG Reset	
Zones	Zone 1
	Adjust
	Type
	Zone 2
	Adjust
	Type
PM	
Advanced >	Use mode (N/A for SRT LAN radars)
	IR
	Noise rejection
	Target boost (N/A for HALO 5000 radars)
	TGT expansion
	Fast scan mode
	Scan to scan
Settings	

Settings menu

> Access submenu

... Open dialog

Level 1	Level 2
Access control	Service mode
	Enter password ...
System	Key beeps
	Time ...
	Remote controller
	Restore defaults ...
	Files ...
	Advanced ...
	Reboot device
	Registration ...

Level 1	Level 2
	About
Radar	Installation
	Radar video palette
	Target trails palette
	Radar data
	Expanded PPI
Position	Satellites
	Ignore position quality
Alerts	Siren enabled
	Position quality data missing
	Datum type data missing
	Alerts ...
	Test alarm
Units	Distance small
	Own vessel rate of turn
Network	Info
	Control display units ...
	Sources ...
	Priorities table ...
	Device list
	Diagnostics
	NMEA 0183® ...
	LWE Own configuration ...
Own ship	Setup ...
	MMSI
	Own ship AIS data
	Trial maneuver
Simulator	Simulate
	Demo mode
	Files ...
	Advanced ...

7

O2000/O5000 trackball, key function comparison

Most functions can be operated both with the O2000 controller and O5000 trackball unit. The following table gives an overview of key operations for both units.

→ ***Note:*** To use the scroll function, the cursor must be located over an open menu or over the quick access pop-up.

Action	O5000 trackball	Expanded keyboard trackball	O2000
Operate menu			
Activate	Left key	Left key	Enter key - single press
Scroll	Scroll wheel		Rotary knob or arrow keys
Return to previous level	Right key	Right key	Exit key - single press
Exit	Left key outside menu area	Left key outside menu area	Exit key - press and hold
Operate quick access keys			
Select	Left key	Left key	
Open pop-up	Right key	Right key	
Close pop-up	Right key	Right key	
Scroll pop-up options	Scroll wheel		
Select target			
Activate/de-activate AIS target	Left key	Left key	Enter key - single press
Acquire radar target	Left key	Left key	Enter key - single press
Display target menu	Right key	Right key	Enter key - press and hold

8 Terms and abbreviations

ACK	Acknowledge
ACQ	Acquire
ACT	Activate
ADJ	Adjust, Adjustment
ALT	Altitude
AIS	Automatic Identification System
AM	Amplitude Modulation
ANCH	Anchor Watch
ANT	Antenna
AP	Autopilot
APR	April
ARPA	Automatic Radar Plotting Aid
ATON	Aid to Navigation
AUD	Audible
AUTO	Automatic
AZ	Acquisition Zone
AZI	Azimuth Indicator
BCR	Bow Crossing Range
BCT	Bow Crossing Time
BDS	BeiDou Navigation Satellite System
BI	Binary Image
BKGND	Background
BMD	Brush Motor Drive - brushless controller for the S_Band
BRG	Bearing
BRILL	Display Brilliance
BWW	Bearing Waypoint To Waypoint
C UP	Course Up
CCRP	Consistent Common Reference Point
CENT	Centre
CNCL	Cancel
COG	Course Over Ground
CONT	Contrast
CPA	Closest Point Of Approach
CPU	Central Processing Unit
CRS	Course
CTS	Course To Steer
CURS	Cursor
DAY/NT	Day/Night
DECR	Decrease
DEG	Degrees
DEL	Delete
DFLT SET	Default Settings
DGPS	Differential GPS

DISP	Display
DIST	Distance
DPTH	Depth
DR	Dead Reckoning
DSC	Digital Selective Calling
DW	Deep Water
EBL	Electronic Bearing Line
ECDIS	Electronic Chart Display And Information System
ECS	Electronic Chart System
EGNOS	European Geo-Stationary Navigational Overlay System
ENCSOG	Automatic Navigational Chart
EP	Estimated Position
EPFS	Electronic Position Fixing System
EPIRB	Emergency Position Indicating Radio Beacon
EQUIP	Equipment
ERBL	Automatic Range And Bearing Line
ETA	Estimated Time Of Arrival
ETD	Estimated Time Of Departure
EZ	Exclusion Zone
FK	User Function Key
FMCW	Frequency Modulated Continuous Wave
FS	Fast Scan
FWD	Forward
GAS	Grounding Avoidance System
GEOG	Geographic
GLONASS	Global Orbiting Navigation Satellite System
GMDSS	Global Maritime Distress And Safety System
GND TRK	Ground Track
GNDSTAB	Ground Stabilized
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GZ	Guard Zone
H UP	Head Up
HDG	Heading
HL	Heading Line
HR	Hours
I/O	Input/Output
IBS	Integrated Bridge System
ID	Identification
IN	Input
INIT	Initialization
INS	Integrated Navigation System
IR	Interference Rejection
IRCS	Integrated Radio Communication System
ISW	Interswitch

Km	Kilometer
KN	Knots
LBL	Label
LIM	Limit
LOST TGT	Lost Target
LP	Long Pulse
LWE	Lightweight Ethernet
m	Meters
MIN	Minimum
MIN	Minutes
MKR	Marker
MOB	Man Over Board
MP	Medium Pulse
MSTR	Master
N UP	North Up
NAV	Navigation
NC	Normally Closed
NF	Network Function
NLT	Not Less Than
NM	Nautical Mile
NMT	Not More Than
NR	Noise Rejection
NUC	Not Under Command
OFF CENT	Off Centre
OFFTRK	Off Track
ONF	Other Network Function
OS	Own Ship
OSD	Own Ship Data
OUT	Output
PAD	Predicted Area Of Danger
PAST POSN	Past Position
PCB	Printed Circuit Board
PI	Parallel Index Line
PL	Pulse Length
PM	Performance Monitor
POSN	Position
PPC	Predicted Point Of Collision
PPI	Plan Position Indicator
PRF	Pulse Repetition Frequency
PWR	PWR
R BRG	Relative Bearing
R CRS	Relative Course
R VECT	Relative Vector
RAD	Radius
RAIN	Anti Clutter Rain

RCDS	Raster Chart Display System
REF	Echo Reference
REF SOG	Echo Reference Speed
REL or R	Relative
RM	Relative Motion
RM (R)	Relative Motion (Relative Trails)
RM (T)	Relative Motion (True Trails)
RNC	Raster Navigational Chart
RNG	Range
ROT	Rate Of Turn
RR	Range Rings
RSD	Radar System Data
RTE	Route
RX	Receiver
SAF CON	Safety Contour
SAR	Search And Rescue
SC/SC	Scan To Scan
SDME	Speed and Distance Measuring Equipment
SEA	Anti Clutter Sea
SEL	Select
SENC	System Electronic Navigational Chart
SFI	System Function Identifier
SNGF	Serial to Network Gateway Function
SNR	Signal To Noise Ratio
SOG	Speed Over Ground
SP	Short Pulse
SPD	Speed
SRNC	System Raster Navigational
SRT	Small Radar Transceiver
STAB	Stabilized
STBD	Starboard
STC	Sensitivity Time Control
STW	Speed Through Water
T BRG	True Bearing
T CRS	True Course
T SPD	True Speed
T VECT	True Vector
TB	Target Boost
TCPA	Time To Closest Point Of Approach
TE	Target Expand
TGT	Target
Tgt exp	Target expansion
Th	Target threshold
TM	True Motion
TPR	Transponder

TRIAL	Trial Maneuver
TRIG	Trigger Pulse
TRK	Track
TRKG	Tracking
Tracking	Time To Go
TS	Target separation
TT	Tracking Target
TWOL	Time To Wheel Over Line
TX	Transmit, Transmitter
TX/RX	Transceiver
UDP	User Data Protocol
UPS	Uninterruptible Power Supply
VRM	Variable Range Marker
VTS	Vessel Traffic Services
WOL	Wheel Over Line
WOP	Wheel Over Point

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