ADDENDUM, sw release 20.2 for:

- **Zeus™ 3**
- **Zeus™ 3S**
- **Zeus™ 3 Glass Helm**
- **Zeus™ 3S Glass Helm MFD**
- **Zeus™ 3S Glass Helm MPU**
- **Zeus™ 2 Glass Helm**

This addendum documents new features that are included in this software release.

Trademarks

Radar and AIS feature changes

Radar and AIS features are changed, for example:

- Radar panel has more refined symbology (e.g. compass and range rings).
- Radar panel menus are restructured.
- The Radar and AIS target symbols are changed.
- Radar and AIS target trails are changed.
- Radar and AIS target tracking and filtering options are changed.
- To-scale own boat icon with settable radar antenna position has been added.

The following Radar and AIS sections include the changes. Options for different radar systems are described. The radar options available in your display unit depend on your radar system.

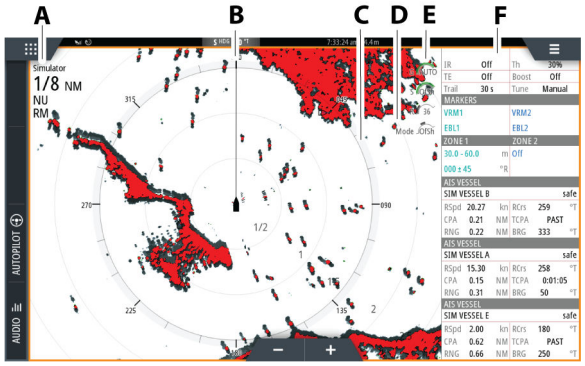
Radar

About radar

Several radar sensors are supported.

This chapter describes features and options for a variety of supported radars. The features and options available to you are dependent on the radar antenna(s) connected to your system.

The Radar panel



A Radar information window

B Heading line*

C Compass*

D Range rings*

E Quick access buttons **

F Data bar *

* Optional radar symbology. Radar symbology can be turned ON/OFF collectively from the radar menu, or individually as described in the radar settings dialog.

** The quick access buttons are accessed by touch operation.

Dual radar

You can use a dual panel page to show radar images from two different radar sources.

→ ***Note:*** Interference will be seen on the Broadband Radar on most ranges when a pulse or Halo radar, and a Broadband radar are transmitting at the same time on the same vessel. We recommend to only transmit on one radar at a time. For example, transmit Broadband radar for typical navigational usage, or pulse or Halo radar to locate weather cells, defined coastlines at a distance and to trigger Racons.

Selecting the radar source

You specify the radar in the radar panel by selecting one of the available radars in the radar source menu option. If you have a multiple radar panel page, the radar is set individually for

each radar panel. Activate one of the radar panels, and then select one of the available radars in the radar source menu option. Repeat the process for the second radar panel, and select an alternative radar for this panel.

➔ ***Note:*** The 3-digit radar source number is the last 3 digits of the radar's serial number.

Radar operational modes

The radar's operational modes are controlled from the Radar panel menu. The modes available are dependent on your radar's capability.

Standby

The power to the radar scanner is on, but the radar is not transmitting.

➔ ***Note:*** You can also put the radar in standby mode from the System Controls dialog.

Transmit

The scanner is on and transmitting. Detected targets are drawn on the radar PPI (Plan Position Indicator).

➔ ***Note:*** You can also put the radar in transmit mode from the system controls dialog.

Adjusting the radar range

The radar range is shown in the system information area on the radar image.

Use the zoom buttons to increase or decrease the range.

Dual range

➔ ***Note:*** Halo 20 does not support dual range.

When connected to a Halo radar (other than Halo 20), it is possible to run the radar in Dual Range mode.

The radar appears in the radar sources menu as two virtual radar sources A and B. Range and radar controls for each virtual radar source are fully independent and the source can be selected for a particular chart or radar panel in the same manner as dual radar described in *"Selecting the radar source"* on page 4.

➔ ***Note:*** Some controls that are related to physical properties of the radar itself are not independent of source. These are Fast Scan, Antenna Height, Sector Blanking and Bearing alignment.

The number of targets that can be tracked for each virtual radar source depends on your radar source.

Up to two independent target tracking zones may be defined for each virtual radar source.

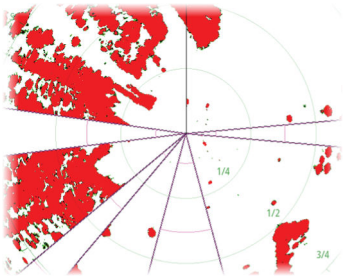
Sector blanking

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.

The sector blanking option is available in the radar installation dialog. Refer to the installation manual.

➔ ***Note:*** Sectors are setup relative to the heading line of the radar. The bearing of the sector is measured from the center line of the sector.

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



Main radar PPI

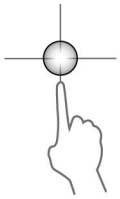
Radar overlay on a chart

Using the cursor on a radar panel

By default, the cursor is not shown on a radar panel.

When you position the cursor on the radar panel, the cursor position window is activated.

The cursor assist function



→ ***Note:*** The cursor assist function is available if it is enabled in the advanced settings dialog. Refer to the operator manual.

The cursor assist function allows for fine tuning and precision placement of the cursor without covering details with your finger.

Activate the cursor on the panel, then press and hold your finger on the screen to switch the cursor symbol to a selection circle, appearing above your finger.

Without removing your finger from the screen, drag the selection circle to the desired position.

When you remove your finger from the screen the cursor reverts to normal cursor operation.

Go to cursor

You can navigate to a selected position on the image by positioning the cursor on the panel, and then using the go to cursor menu option.

New waypoint

You can save a new waypoint at a selected position by positioning the cursor on the panel, and then using the new waypoint menu option.

Adjusting the radar image

The radar image can be improved by adjusting the gain, by filtering out unwanted echoes due to sea clutter, rain or other weather conditions, and by tuning the sensitivity of the radar receiver.

You can adjust the gain, sea clutter, and rain clutter by selecting the relevant icon in the top right corner of the radar panel or from the radar panel main menu.

→ ***Note:*** The radar image settings do not affect the AIS targets.

Sea and rain clutter can be present at the same time, and further degradation in detection performance will be experienced. As sea clutter is related to short range and rain clutter is usually present in a longer range, rain clutter settings can be adjusted without affecting the echoes in the sea clutter area.

The radar image can be adjusted as described in the next sections.

Radar modes

Use modes are available with preset control settings for different environments. Not all modes are available for all radar models.

Custom mode

All radar controls can be adjusted and will be retained after a mode change or radar power cycle. Radar defaults are set for general purpose use.

Harbor mode

The radar settings are optimized for areas such as busy waterways and large man-made structures where good target discrimination and rapid image updates are needed.

Offshore mode

The radar settings are optimized for offshore sea conditions and making isolated targets larger and easy to see.

Weather mode

The radar settings are optimized for best detection and presentation of rain clutter. Image update rate is slowed and color depth is increased.

Bird mode

The radar settings are optimized for best detection of birds. The radar is set up for maximum sensitivity. This mode is not recommended for use in congested harbor environments.

Available controls for the various use modes

Not all controls are adjustable in each mode. The following table shows preset controls and adjust-ability for each control.

	Custom	Harbor	Offshore	Weather	Bird
Noise rejection	Adj.	Medium	High	Medium	High
Threshold	Adj.	30%	30%	0%	0%
Target Expansion	Adj.	Low	Medium	Off	Off
Interf. Reject	Adj.	Adj.	Adj.	Adj.	Adj.
Target Separation	Adj.	Medium	Off	Off	Off
Fast scan	Adj.	High	High	Off	Off

Modes in dual ranges

When connected to a radar with dual range capability, it is possible to run the radar in Dual Range mode.

Modes can be set independently for each range. For example, you can have Offshore mode for range A and Weather mode for range B. However, interaction between ranges occurs in some cases:

- When using Bird mode for both ranges, maximum range is restricted to 24 NM and range resolution is reduced.
- Fast scan - The antenna rotation speed is set to the slower of the two modes selected. For example, Fast Scan is disabled when using Harbor and Weather modes because Fast Scan is Off in Weather mode.
- The Interference reject setting can affect the interference seen or removed on both ranges.

Directional clutter rejection

This mode is active when Sea clutter is set to Auto or Harbor/Offshore (options are dependent on the radar model). The gain of the radar receiver is adjusted dynamically during

the 360 deg. sweep according to the sea clutter level, for increased target sensitivity to leeward and in heavier sea states. For Halo radars it is also possible to fine tune the directional clutter rejection with Auto offset adjustments.

➔ ***Note:*** This mode is not selectable in the menu and you cannot see that it is activated in the panel or menu.

When Sea clutter is set to Manual, the Directional Clutter Rejection mode will be OFF (non-directional).

Sea state settings of Calm, Moderate or Rough are available in the menu to better optimize the radar image to your liking.

Gain

The gain controls the sensitivity of the radar receiver.

A higher gain makes the radar more sensitive to radar returns, allowing it to display weaker targets. If the gain is set too high, the image might be cluttered with background noise.

Gain has a manual and an automatic mode. You toggle between automatic and manual mode in the slide bar.

Sea clutter

Filters the effect of random echo returns from waves or rough water near the vessel.

When you increase the value, the sensitivity of the near field clutter caused by waves is reduced. If the value is increased too much, both sea clutter and targets will disappear from the display. Targets around own ship may then not be shown as potentially dangerous targets.

The system includes predefined sea clutter settings for harbor and offshore conditions, in addition to the manual mode where you can adjust the settings.

➔ ***Note:*** At increasing levels of sea clutter, some targets cannot be detected even by means of sea clutter filtering, since buoys or other small objects are producing echoes of a level lower than the ones coming from waves.

Sea State

Set the Sea State control according to current sea conditions for best sea clutter rejection.

Rain clutter

Rain clutter is used to reduce the effect of rain, snow or other weather conditions on the radar image. When you increase the value, the sensitivity of the long distance field clutter caused by rain is reduced. The value should not be increased too much as this may filter out real targets.

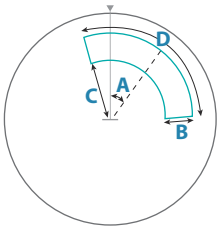
If the precipitation is located over the ship's position, the adjustment of rain clutter will affect the presentation of near echoes.

Setting a guard zone around your vessel

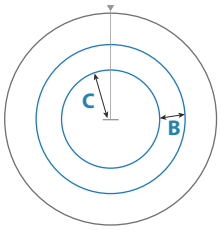
A guard zone is an area (either circular or a sector) that you can define on the radar image. When activated, an alarm alerts you when a radar target enters or exits the zone.

Defining a guard zone

1. Ensure that the cursor is not active
2. Activate the menu, select **Guard zones**, then select one of the guard zones
3. Select the shape for the zone
   - The adjustment options depend on the guard zone shape
4. Select **Adjust** to define the settings for the guard zone. The values can be set from the menu or by dragging on the radar panel.
   - **A**: Bearing, relative to the vessel heading
   - **B**: Depth
   - **C**: Range, relative to vessel center
   - **D**: Width
5. Select the save option to save your settings.



Shape: Sector



Shape: Circle

Alarm settings

An alarm is activated when a radar target breaches the guard zone limits. You can select if the alarm is activated when the target enters or exits the zone.

Sensitivity

The guard zone sensitivity can be adjusted to eliminate alarms for small targets.

Radar target symbols

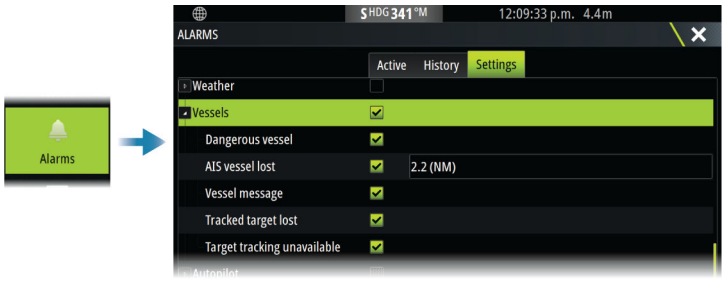
The system uses the target symbols shown below.

	Radar target, not moving.
	Radar moving target with trail when target history is enabled.
	Moving radar target with no course extension (short line indicating the direction where the target moves).
	Moving radar target with course extension.
	Dangerous radar moving target (yellow), with trail when target history is enabled. The yellow color is shown when the radar palette is black/red or black/green.
	Dangerous radar moving target (purple), with trail when the target history is enabled. The purple color is shown when the radar palette is white/red.
	Dangerous radar dangerous moving target (red), with trail when target history is enabled. The red color is shown when the radar palette is black/yellow.
	Associated target. When the radar and the AIS signal acquire the same target, the system will display the target with one symbol. This reduces the number of AIS symbols and radar targets on the PPI. The association function also compensates for a possible failure in one of the two targets, e.g., if the radar target is positioned behind an island, the system keeps tracking and visualizing the AIS target. → ***Note:*** The radar target continues to be analyzed by the system when the target association is active.
	Selected radar target.
	Lost radar target.

Dangerous targets

Radar targets are defined as dangerous targets in the Vessels and tracked targets dialog (TCPA/CPA settings), refer to *"Vessels and tracked targets"* on page 15.

For the system to display dangerous target alert messages when dangerous targets are detected, the Dangerous vessel option must be enabled in the Vessels section of the Alarms settings dialog.



Dangerous target alert messages

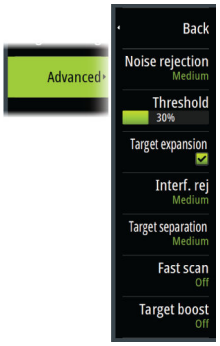
When a vessel meets the dangerous target criteria set in the Vessels and tracked targets dialog (TCPA/CPA settings) and if the Dangerous target alert option in the Alarms settings dialog is enabled, a dangerous target alert message dialog is displayed. The following options are available in the message dialog:

- **Disable**, closes the message dialog and cancels the dangerous target alert for all vessels. You can re-enable the dangerous vessel alert in the Vessels section of the Alarms settings dialog.

→ ***Note:*** When Disable is selected, the Dangerous target alert option in the Alarms settings dialog is turned off. When the Dangerous target alert option is turned off (disabled), dangerous target alert messages are not generated for either radar or AIS dangerous targets.

- **Ignore**, closes the message dialog and disables the alert for that vessel. The alert for that vessel will reappear if the status of that vessel changes, i.e. that vessel becomes safe and then dangerous again.
- **View**, closes the message dialog and opens the Radar panel with the dangerous vessel's pop-up activated. You can select the vessel's pop-up in the radar panel to see the vessel details.

Advanced radar options



Menu options can vary depending on your radar's capability and the selected operation mode.

Noise Rejection

Sets the amount of noise filtering applied by the radar. Target sensitivity is increased at longer ranges when this control is set to Low or High, but does cause some loss of target discrimination.

→ ***Note:*** To get maximum range performance from the radar, transmit on one range only, set the Noise Reject control to High and the threshold as low as possible. The default is 30% for less clutter on the screen. In some areas where extreme high interference may exist, try OFF for best radar image.

Threshold

The threshold sets required signal strength for the lowest radar signals. Radar returns below this limit are filtered and are not displayed.

Target expansion

Target expansion increases the length of targets in range, making them easier to see.

Rejecting radar interference

The Interference rejection (IR or Interf. rej.) option is used to eliminate second trace echoes from far distance targets, and the interference from radar units operating in the same frequency band.

When the IR is ON, transceiver pulse staggering is enabled. When enabled, the transceiver PRF is changed slightly for each sweep. By doing this, spiral interferences and second trace echoes are split in range from sweep to sweep. The IR processing clears all the echoes found at the same range if they are not present in each sweep.

The IR must be chosen according to the environment around own ship:

- IR off when the maximum signal from the receiver is needed
- IR on when the interference or second trace echoes disturb the radar image

To avoid missing weak targets, the interference rejection should be set to OFF when no interference exists.

Target separation

Controls the target discrimination of the radar (separation between objects is more prominent).

Fast scan

Sets the speed of the radar antenna rotation. This option gives faster target updates.

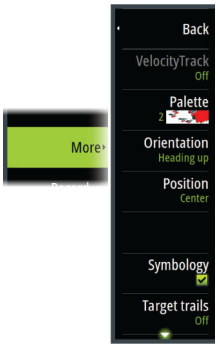
→ ***Note:*** Maximum speed may not be achieved depending on the radar Settings, Mode, and Range selected. The radar will only rotate as fast as the current control settings allow.

Target boost

The target boost control increases pulse length or reduces radar bandwidth to make targets appear larger in range and increase radar sensitivity.

More options

Menu options can vary depending on your radar's capability.



VelocityTrack

→ ***Note:*** When VelocityTrack is enabled antenna rotation speed may be reduced.

→ ***Note:*** When operating the radar in Dual range mode with one of the ranges set to 36 nm or more, increased VelocityTrack coloring noise over land areas may be seen.

Doppler coloring is a navigation aid to distinguish moving targets approaching or diverging from your vessel. The radar indicates if a target is approaching or diverging from your vessel when both these conditions are true:

- The target's relative speed is greater than the VelocityTrack speed threshold.
- The target is not geo-stationary (e.g. land or a marker buoy).

The following options are available:

- Off - turns off Doppler coloring
- Normal - approaching targets and diverging targets are colored.
- Approaching targets - only approaching targets are colored

The color of approaching and diverging targets depends on the palette used:

- Diverging targets are blue colored on all radar image palettes.
- Approaching target colors on radar image palettes:
  - Black/Red palette - Yellow
  - White/Red palette - Yellow
  - Black/Green palette - Red
  - Black/Yellow palette - Red

VelocityTrack settings

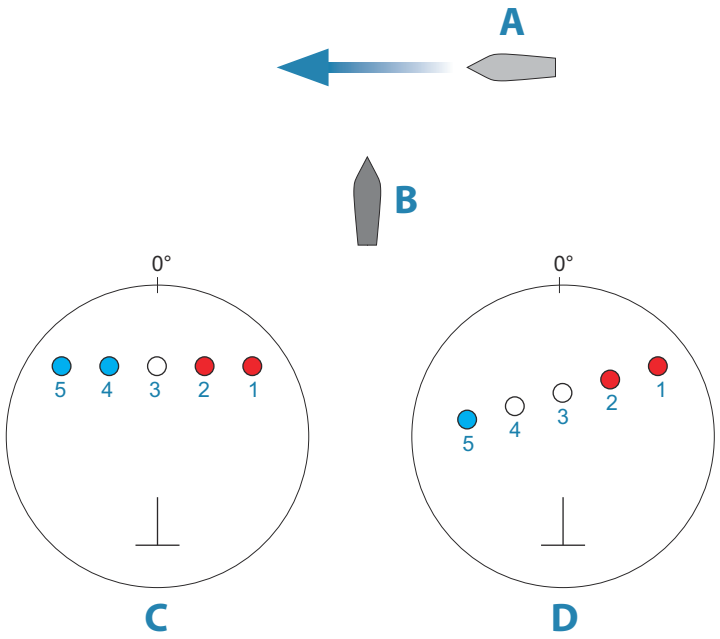
Use this dialog to set speed thresholds of targets to be colored.

The speed threshold can be defined to apply for the radar source of the selected radar panel only, or to all radar sources connected to the system. The setting is only applied to those radars powered and connected at the time the setting is made. If the all radar sources option is selected, newly connected radars will use the specified values automatically.

VelocityTrack examples

Approaching and diverging moving targets can be indicated as neutral (not colored) in some circumstances. The navigator should be aware of these situations to safely use the VelocityTrack feature as an aid for collision avoidance.

Examples of how VelocityTrack behaves in 2 navigation scenarios is illustrated below. The illustrations show a target (**A**) crossing own vessel's (**B**) path.



The examples show the target movement (1-5) over 5 radar scans with the radar in relative motion mode.

In example **C**, own vessel COG is 0°, and speed is 0 knots.

In example **D**, own vessel COG is 0°, and speed is 10 knots.

In both examples, the target COG is 270°, and the speed is 20 knots.

The colors in the examples are according to the colors used for black/green and black/yellow radar palettes:

- Red (**C1**/**C2** and **D1**/**D2**), indicating the target is on an approaching path to own vessel. Its relative speed at that point is greater than the VelocityTrack speed threshold.
- Not colored (**C3** and **D3/D4**), indicating it is temporarily neutral because its relative speed at that point is less than the VelocityTrack speed threshold.
- Blue (**C4**/**C5** and **D5**), indicating the target is diverging away from own vessel and its relative speed at that point is greater than the VelocityTrack speed threshold.

The radar palette

Different colors (palettes) can be used to represent detail on your radar panel.

Radar orientation

Radar orientation is indicated on the upper left corner of the radar panel as either HU (Heading UP), NU (North Up) or CU (Course up).

Head-up

In head-up mode, the heading line on the PPI is oriented on the 0° on the bearing scale and towards the top of the screen. The radar image is displayed relative to own ship, and when the ship turns the radar image rotates.

➔ ***Note:*** Head-up is only available in relative motion mode, and it is the only orientation mode available if the radar is not connected to a heading source.

North up

In north up mode, the 0° indication on the PPI represents north. The heading line on the PPI is oriented according to own ship heading obtained from the compass. When the ship turns the heading line changes its direction according to the ship's heading, while the radar image remains stabilized.

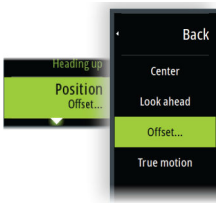
The north up orientation is not available if no heading source is connected to the radar. If heading data is lost, the system will automatically switch to head-up orientation.

Course up

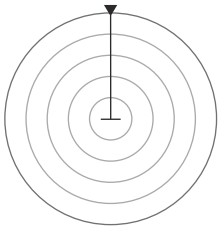
In course up mode, the top of the bearing scale indicates the ship's true course measured from north at the time course up was activated. When the ship turns the bearing scale remains fixed, while the heading line rotates with the ship's yawing and course change.

The course up orientation is reset by re-selecting the course up mode.

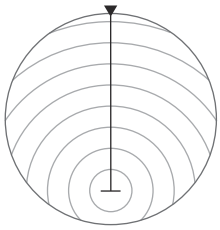
Offsetting the PPI center



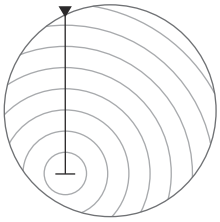
You can set the antenna position origin to a different location on the radar PPI. The options described in the next sections are available.



PPI center: Center



PPI center: Look Ahead



PPI Center: Offset

Center

The Center option resets the antenna position to the center of the PPI.

Look ahead

The Look ahead option is used to maximize the view ahead of the vessel. When selected the PPI center is placed at 70% of the radius of the PPI, 180° opposite the top of the display.

➔ ***Note:*** The look ahead option is only available for heading up radar orientation.

Offset

This option allows you to use the cursor for selecting the PPI center.

Move the cursor to the preferred offset position, and confirm your selection.

Radar motion mode

Radar motion is indicated on the upper left corner of the radar panel as either TM (True motion) or RM (Relative motion).

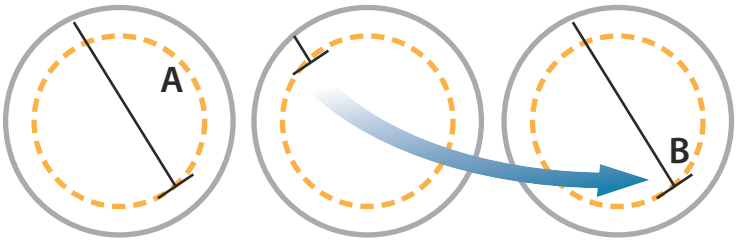
Relative motion

In relative motion your vessel remains in a fixed location on the Radar PPI, and all other objects move relative to your position.

You select the position of the fixed location as described in *"Offsetting the PPI center"* on page 12.

True motion

In true motion your vessel and all moving targets move across the Radar PPI as you travel. All stationary objects remain in a fixed position. When the vessel's symbol reaches 75% of the PPI radius (**A**), the radar image is redrawn with the vessel symbol re-positioned (**B**) 180° opposite the current heading bearing.



When true motion is selected, the true motion reset option is available from the menu. This allows for manually resetting the radar image and vessel symbol to its starting position.

→ ***Note:*** True motion is only available when the PPI is in either north up or course up orientation mode. To set to true motion in the MFD, select the Position option in the More menu and then select the True motion option.

Radar symbology

Use this menu option to collectively turn on/off radar symbology which are selected to show in the Radar Settings panel (refer to *"Radar settings"* on page 14).

Target trails

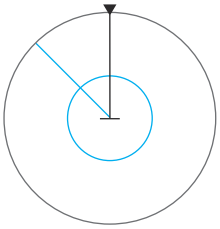
A target trail indicates the target movement by leaving an afterglow, gradually reducing the intensity over time.

Target trails show where a target used to be, and the function is useful for quickly assessing the movement of targets relative to your own vessel.

You can set the length of the trails. The length represents the time it takes for the trails to fade out. You can also turn OFF target trails.

Clear trails

The clear trails option clears target trails from your radar panel temporarily. The trails start to build up again unless you switch the function off.



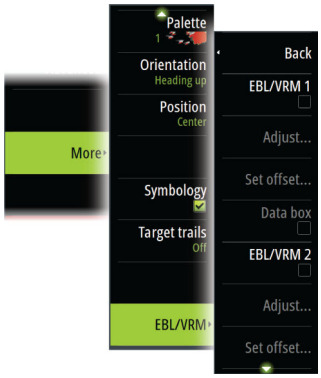
EBL/VRM markers

The electronic bearing line (EBL) and variable range marker (VRM) allows quick measurements of range and bearing to vessels and landmasses within radar range. Two different EBL/VRMs can be placed on the radar image.

The EBL/VRMs are by default positioned from the center of the vessel. It is, however, possible to offset the reference point to any selected position on the radar image.

Defining an EBL/VRM marker

1. Ensure that the cursor is not active.
2. Activate the More menu, select EBL/VRM, and then select EBL/VRM 1 or EBL/VRM 2.



The EBL/VRM is now positioned on the radar image.

3. Select the adjustment option from the menu if you need to reposition the marker.
4. Adjust the marker by dragging it into position.
5. Save your settings.

Placing EBL/VRM markers by using the cursor

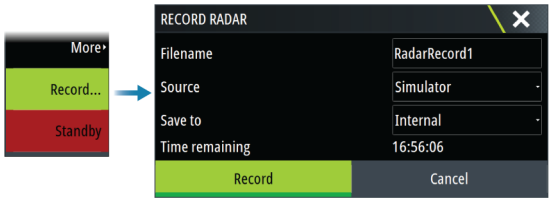
1. Position the cursor on the radar image
2. Activate the menu
3. Select one of the EBL/VRM markers
   - The EBL line and the VRM circle are positioned according to the cursor position.

Offsetting an EBLVRM marker

1. Ensure that the cursor is not active.
2. Activate the menu and select EBL/VRM, then select the marker you wish to offset.
3. Select the set offset option.
4. Position the cursor on the radar panel to set the offset position.
5. Select the save option to save your settings.

You can reset the EBL/VRM center to vessel position from the menu.

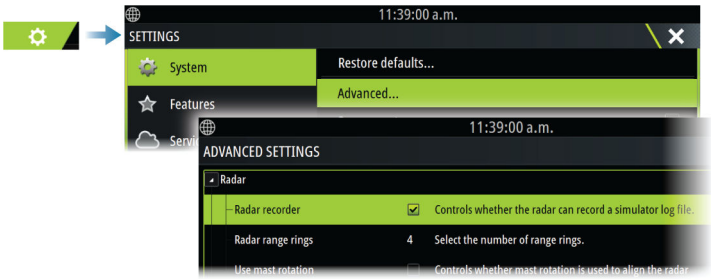
Recording radar data



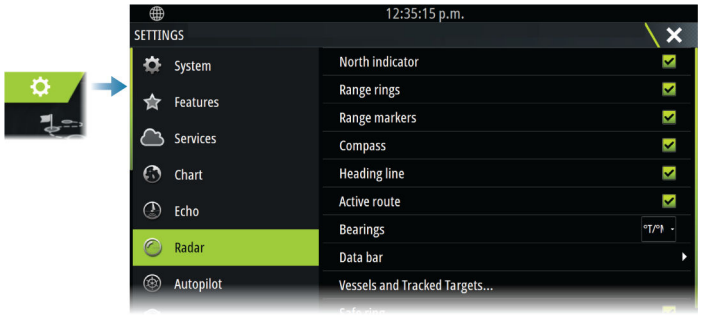
You can record radar data and save the file internally in the unit, or save it onto a storage device connected to the unit.

A recorded radar file can be used for documenting an event or an operational error. A logged radar file can also be used by the simulator.

→ ***Note:*** The record menu option is available if recording is turned on in the Advanced system settings.



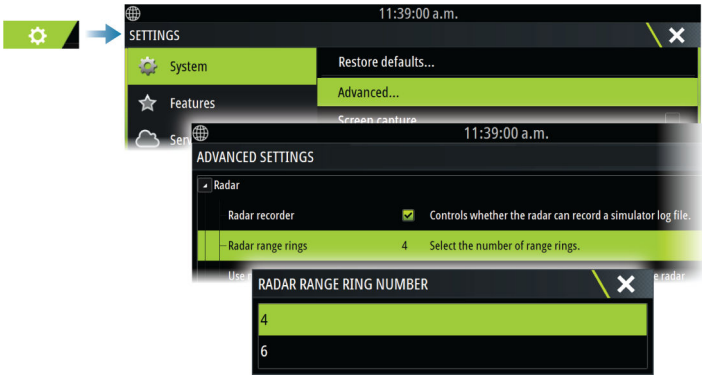
Radar settings



Radar panel symbology

Select to show or deselect to hide symbology on the radar panel:

- North indicator
- Range rings
  You can specify the number of rings to be displayed on the radar panel from the Advanced settings dialog.



- Range markers
- Compass
- Heading line
- Active route

Radar panel symbology can be collectively turned on/off from the Symbology option in the More sub-menu if they are selected to show in the radar settings dialog.

Bearings

Used for selecting whether the bearing should be measured in relation to True/Magnetic North (°T/°M), or relative to own vessel (°R).

➔ ***Note:*** True bearing can only be selected when a compass is available.

Data bar

Turns on/off the radar data bar. Refer to the radar panel illustration.

By default, the data shows targets arranged with the most dangerous targets on top. You can select to show radar targets on top and before any AIS targets, even if the AIS targets are considered more dangerous.

Vessels and tracked targets

This dialog contains settings for both AIS and radar targets. AIS specific settings are only available if you have a capable AIS device connected to your system.

Use this option to specify:

- Dangerous targets
  - **Time to closest point of approach** - specify the time of approach in which a vessel is to be considered dangerous.
  - **Closest point of approach** - specify the closest point of approach in which a vessel is to be considered dangerous. This setting determines the size of the safe ring if safe ring is enabled, refer to *"Safe ring"* on page 16.
- Targets of interest - targets further away than the following distance will be hidden:
  - **Range of interest** - specify to show targets in all ranges (based on radar range) or targets within a specific distance of own vessel.
- Filtering - define which and how many AIS targets will be shown. If the amount of targets exceeds the set number, only the most interesting targets will be shown. For radars that support tracking targets, the following target filter settings will also apply to tracked targets.
  Filter options are:
  - **Show** - specify to show all targets, dangerous targets, or no targets.
  - **Max AIS targets** - specify to show all AIS targets or specify a maximum number of AIS targets to be shown.
  - **Hide slower than** - specify to hide targets slower than a specific speed or all targets regardless of speed.
  - **Hide lost targets after** – specify to hide targets that are lost after a certain amount of time or do not hide any lost targets.

Safe ring

A safe ring can be added around your vessel to present the danger zone. The radius of the ring is the same as the closest point of approach as set in the Vessels and Tracked Targets dialog. Refer to *"Vessels and tracked targets"* on page 15.

Installation

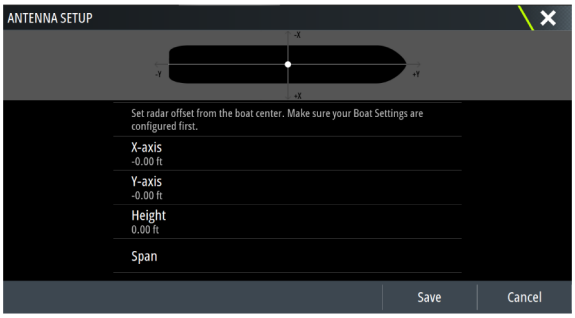
The Installation option is used for making radar installation settings. Installation settings must be made before using the radar. Installation setup settings are described in the separate Radar or the display unit's installation manuals.

New antenna setup option

The Antenna setup option is added to the radar installation dialog.

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.

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.

The antenna span is the total length of the antenna.

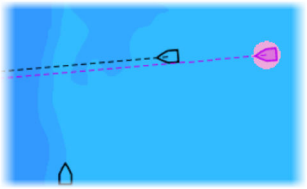
AIS

About AIS

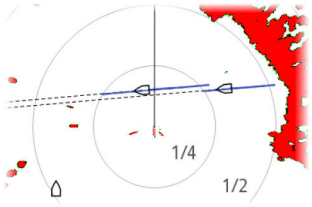
If a compatible AIS (Automatic Identification System) is connected to the system, AIS targets can be displayed and tracked. You can also see messages and position for DSC transmitting devices within range.

AIS targets can be displayed as overlay on chart and radar images.

The AIS is an important tool for safe travelling and collision avoidance. You can set alarms to notify you if an AIS target gets too close or if the target is lost.

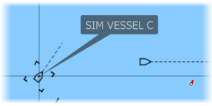


AIS vessels on a chart panel



AIS vessels on a radar panel

Selecting an AIS target



When you select an AIS icon, the symbol changes to selected target symbol. Only one target can be selected at a time.

➔ ***Note:*** Pop-up information must be enabled in the chart setting dialog to see the vessel's name. Refer to chart settings in the operator manual.

Searching for AIS vessels

You can search for AIS targets by using the find option in the menu. If the cursor is active, the system searches for vessels around the cursor position. Without an active cursor, the system searches for vessels around your vessel's position.

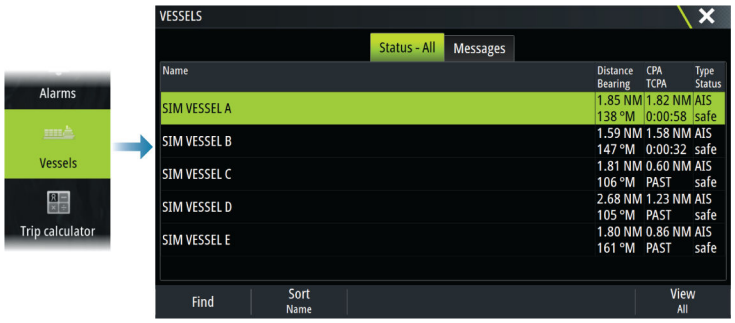
Displaying target information

The vessels dialog

The vessels dialog displays a list of all targets.

By default, the dialog lists targets, arranged by distance to own vessel. You can select to change the sort order, and to display only a selected target type.

The vessels dialog also lists received AIS messages.

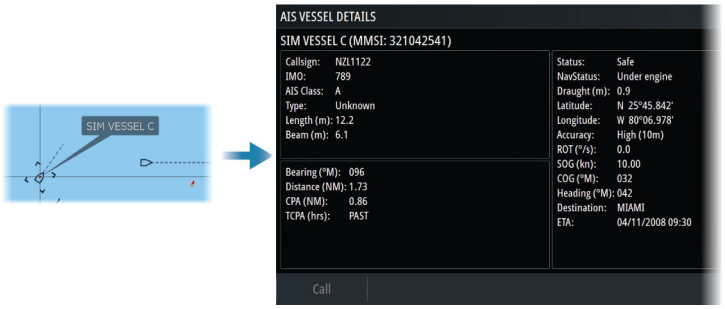


AIS vessel details

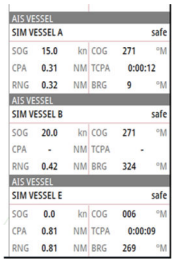
Detailed information about an AIS target is available from the AIS vessels details dialog.

To display the dialog:

- select the AIS pop-up
- select the info option in the menu



AIS information on radar panels



The radar data bar includes information about targets.

The targets are listed with the closest target on top, and are color coded to indicate target status.

Calling an AIS vessel

If the system includes a VHF radio supporting DSC (Digital Select Calling) calls over NMEA 2000, a DSC call can be initiated to other vessels from the unit.

The call option is available in the AIS vessel details dialog, and in the vessel status dialog. Refer to *"Displaying target information"* on page 17.

DSC Vessel tracking

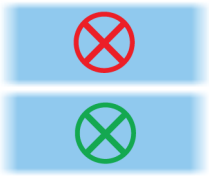
DSC (Digital Selective Calling) is a semi-automated method of requesting or receiving position data from a vessel with a DSC VHF radio. For more information on how to use this, refer to your VHF radio manual.

There are various types of DSC position messages, including distress calls. The type of message made determines information sent with the call, and how the radio and MFD respond to the incoming call.

When a DSC message has been received, the MFD will display a DSC vessel icon on the chart panel and radar panel at the received coordinates. In addition, some radios will send COG and SOG with the position data. This allows for correct orientation of the icon.

When receiving a distress message you will see an alarm box informing you that a message has been received. This can be read under the messages tab on the vessels dialog. Select the vessels button in the toolbar to display the vessels dialog.

AIS SART



When an AIS SART (Search and Rescue Transponder) is activated, it starts transmitting its position and identification data. This data is received by your AIS device.

If your AIS receiver is not compliant with AIS SART, it interprets the received AIS SART data as a signal from a standard AIS transmitter. An icon is positioned on the chart, but this icon is an AIS vessel icon.

If your AIS receiver is compliant with AIS SART, the following takes place when AIS SART data is received:

- An AIS SART icon is located on the chart in the position received from the AIS SART. The AIS SART icon is red when in 'Active' state. It is green when in 'Test' state.
- An alarm message is displayed.

If you have enabled the siren, the alarm message is followed by an audible alarm.

→ ***Note:*** The icon is green if the received AIS SART data is a test and not an active message.

AIS SART alarm message

When data is received from an AIS SART, an alarm message is displayed. This message includes the AIS SART's unique MMSI number, and its position, distance, and bearing from your vessel.

You have the following options:

- Ignore the alarm
  - The alarm is muted and the message closed. The alarm does not reappear.

→ ***Note:*** If you ignore the alarm, the AIS SART icon remains visible on your chart, and the AIS SART remains in the vessels list.

- Save the waypoint
  - The waypoint is saved to your waypoint list. This waypoint name is prefixed with MOB AIS SART - followed by the unique MMSI number of the SART. For example, MOB AIS SART - 12345678.
- Activate the MOB function
  - The display switches to a zoomed chart panel, centered on the AIS SART position.
  - The system creates an active route to the AIS SART position.

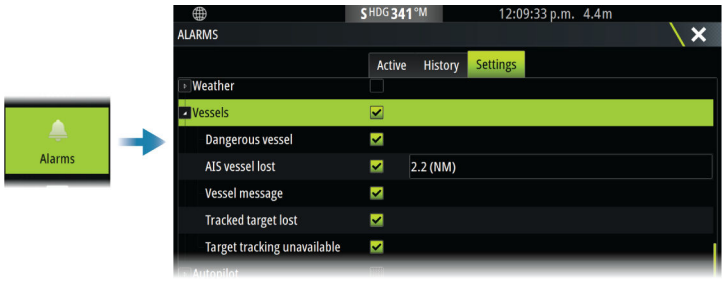
→ ***Note:*** If the MOB function is already active, this will be terminated and replaced by the new route towards the AIS SART position.

→ ***Note:*** If the AIS stops receiving the AIS SART message, the AIS SART remains in the vessels list for 10 minutes after it receives the last signal.

Vessel alarms

You can define several alarms to alert you if a target shows up within predefined range limits, or if a previously identified target is lost.

Note: For the system to display dangerous target alert messages when dangerous targets are detected, the Dangerous vessel option must be enabled.



Dangerous targets

AIS targets are defined as dangerous targets in the Vessels and tracked targets dialog (TCPA/CPA settings), refer to *"Vessels and tracked targets"* on page 21.

Dangerous target alerts

When a vessel meets the dangerous target criteria set in the Vessels and tracked targets dialog (TCPA/CPA settings) and if the Dangerous target alert option in the Alarms settings dialog is enabled, a dangerous target alert message dialog is displayed. The following options are available in the message dialog:

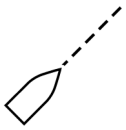
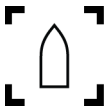
- **Disable**, closes the message dialog and cancels the dangerous target alert for all vessels. You can re-enable the dangerous vessel alert in the Vessels section of the Alarms settings dialog.

→ ***Note:*** When Disable is selected, the Dangerous target alert option in the Alarms settings dialog is turned off. When the Dangerous target alert option is turned off (disabled), dangerous target alert messages are not generated for either radar or AIS dangerous targets.

- **Ignore**, closes the message dialog and disables the alert for that vessel. The alert for that vessel will reappear if the status of that vessel changes, i.e. that vessel becomes safe and then dangerous again.
- **View**, closes the message dialog and opens the chart panel with the dangerous vessel's pop-up activated. You can select the vessel's pop-up in the chart panel to see the AIS vessel details.

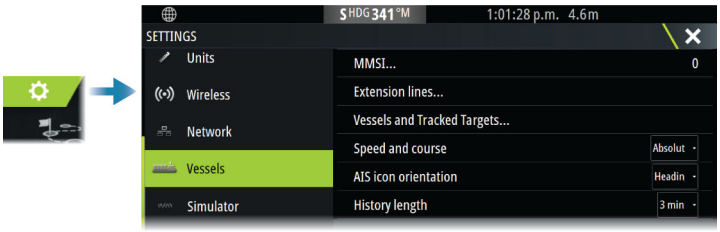
AIS target symbols and icons

Symbol	Description
	AIS target, stationary or moving if no extension lines enabled
	AIS dangerous target (yellow). The yellow color is shown when the radar palette is black/red or black/green.
	AIS dangerous target (purple). The purple color is shown when the radar palette is white/red.
	AIS dangerous target (red). The red color is shown when the radar palette is black/yellow.

Symbol	Description
	AIS scaled target. The symbol is scaled according to physical size of the vessel as obtained from AIS info, if available.
	AIS moving target with predicted course extension (dashed line). Will show as a straight line if going straight or if no rate-of-turn AIS data is available.
	AIS moving target with trail.
	AIS moving target with predicted turn extension (based on rate-of-turn AIS data.)
	AIS moving target with predicted turn extension (based on rate-of-turn AIS data) and turn trail.
	Associated target. When the radar and the AIS signal acquire the same target, the system will display the target with one symbol. This reduces the number of AIS symbols and radar targets on the PPI. The association function also compensates for a possible failure in one of the two targets, e.g., if the radar target is positioned behind an island, the system keeps tracking and visualizing the AIS target. ***Note:*** The radar target continues to be analyzed by the system when the target association is active.
	Selected AIS target, indicated with square corners around the target symbol.
	Lost AIS target, indicated with a line on the target symbol. The symbol is located at the last received position from the target
	AIS AtoN (Aids To Navigation) target symbol.
	AIS AtoN (Aids To Navigation) target symbol.
	AIS AtoN (Aids To Navigation) dangerous target. The yellow color is shown when the radar palette is black/red or black/green.
	AIS AtoN (Aids To Navigation) dangerous target. The purple color is shown when the radar palette is white/red.
	AIS AtoN (Aids To Navigation) dangerous target. The red color is shown when the radar palette is black/yellow.

Symbol	Description
	AIS SART 'active' icons are red.
	AIS SART 'tests' icons are green.

Vessel settings



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.

Extension lines

Defines the length of course over ground and heading extension lines for your own vessel and for other vessels.

The length of the extension lines is set to indicate the distance the vessel will move in the selected time period.

Your own vessel heading information is read from the active heading sensor, and COG information is received from the active GPS. For other vessels COG data is included in the message received from the AIS system.

Vessels and tracked targets

This dialog contains settings for both AIS and radar targets. Radar specific settings are only available if you have a capable radar connected to your system.

→ ***Note:*** For radar specific settings, refer to *"Vessels and tracked targets"* on page 15.

By default, all targets are shown on the panel if an AIS device is connected to the system. You can select not to show any targets, or to filter the icons based on security settings, distance, and vessel speed using this option.

Use this option to specify:

- Dangerous targets
  - **Time to closest point of approach** - specify the time of approach in which a vessel is to be considered dangerous.
  - **Closest point of approach** - specify the closest point of approach in which a vessel is to be considered dangerous.
- Targets of interest - targets further away than the following distance will be hidden:
  - **Range of interest** - options are Auto (based on radar range if radar is available) or within a specific distance of own vessel.
- Filtering - define which and how many AIS targets will be shown. If the amount of targets exceeds the set number, only the most interesting targets will be shown. For radars that support target tracking, the following target filter settings will also apply to tracked targets.
  Filter options are:
  - **Show** - all targets, dangerous targets, or no targets.
  - **Max AIS targets** - show all or only a maximum number of AIS targets.

- **Hide slower targets** - show targets slower than a specific speed or all targets regardless of speed.
- **Hide lost targets** - hide lost targets that are lost for the specified amount of time.

Speed and course

The extension line can be used to indicate speed and course for targets, either as absolute (true) motion or relative to your vessel.

AIS icon orientation

Sets the orientation of the AIS icon, either based on heading or COG information.

History length

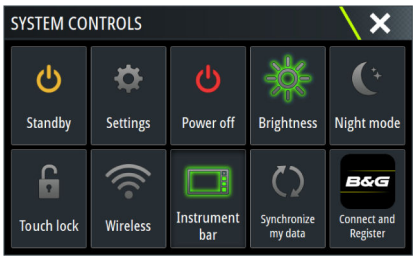
Trails can be used to visualize the previous positions of a target.

The history length defines the time presentation of the trail.

Device connect and register

The 'Registration' buttons are changed to 'Connect and Register' in the system controls and system settings dialogs.

Example of changed system controls dialog:



You can register your device by following the instructions when selecting the 'Connect and Register' button in the system settings dialog or system controls dialog.

Multiple IP camera support

Multiple IP camera sources can be added to the system. The video from the camera source can then be displayed in the video panel. Also, the cycle menu option in the video panel can be used to cycle through displaying different cameras in the panel.

IP Cameras supported

The following IP cameras are supported:

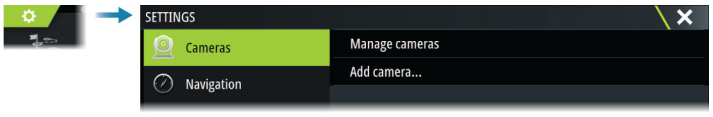
- IRIS S460
- AXIS P1244 A
- FLIR M232

Camera requirements

To add a camera to the system, the following are required:

- Ethernet connection IP camera
- H.264 video format with RTSP streaming
- The camera URL address (and username/password if applicable)

Cameras settings



Manage cameras

Use to manage defined cameras.

Add camera

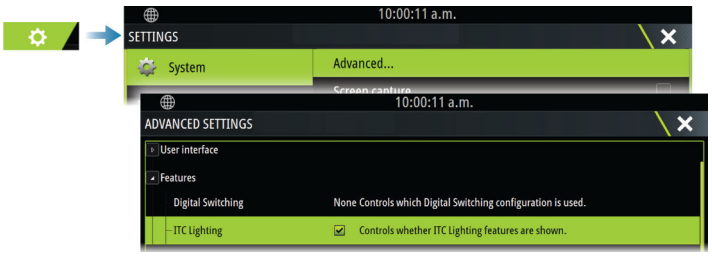
Use to configure a new camera. Refer to the camera documentation.

ITC lighting

An ITC light controller can be connected to the NMEA 2000 network and configured to allow control of your vessel's lighting from the control bar in the MFD.

For information on how to install the controller, refer to the ITC lighting controller documentation.

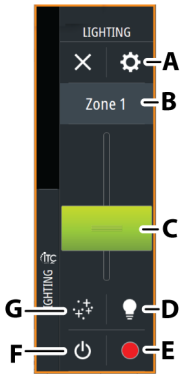
Activating/deactivating the ITC light controller



Once the ITC lighting controller is installed and connected to the NMEA 2000 network, it should appear in the control bar. If it is not appearing in the control bar, you can activate it from the Advanced settings dialog.

You can also use the Advanced settings dialog to deactivate ITC lighting in the control bar.

The ITC lighting control bar



A	Zone management button
B	Select to toggle zones. The zone displayed is controlled with the buttons below.
C	Brightness adjustment of lights in the zone.
D	Activates/deactivates Quick White mode. Select to turn all unlocked and active zones immediately white, select again to return all zones back to previous state.
E	Color adjustment of lights in the zone.
F	Turns on/off the lights in the zone.
G	Select to define the mode of the lights in the zone: • Color fade • Music sync

No connection

If a connection problem occurs between the MFD and the ITC light controller, a not connected message is shown in the control bar.

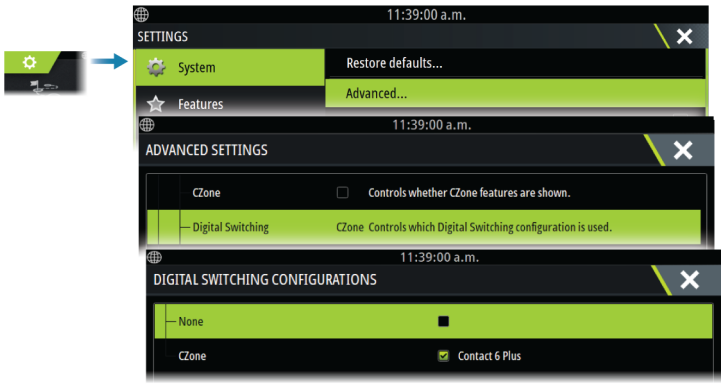
CZone digital switching

A CZone digital switching device can be connected to the NMEA 2000 network and configured to allow control from the control bar of the MFD.

The digital switching bar is displayed in the control bar automatically when the CZone digital switching device is configured to be included in the control bar. For information on how to configure the device to be included in the control bar, refer to the CZone digital switching device documentation.

Digital switching configurations dialog

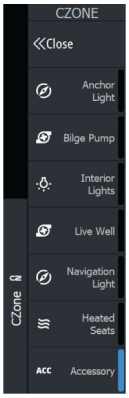
CZone digital switching devices can be disabled from the digital switching configurations dialog.



- Un-select the devices that are to be removed from the control bar.
- Select None to remove all CZone devices from the control bar.

Multiple switching devices can be connected to the network. When you select to display more than the maximum of devices allowed at a time, a message informs you the maximum has been reached.

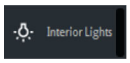
CZone digital switching control bar



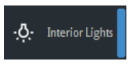
If configured and setup properly, the CZone digital switching device can be operated from the control bar.

Control bar buttons

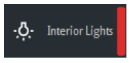
The button indicates the status of the switch.



Off (black)
The switch is OFF.



On (blue)
The switch is ON.



Error (red)
There is a switch or communication error.

Communication error

If a communication error occurs between the MFD and the CZone digital switching device, an error message is shown in the control bar.

CZone panel disabled from opening at startup

The fullscreen CZone panel is now disabled from opening at startup by default. If it is opening already on your unit and you do not want it to, you can stop it from automatically opening at start up from the CZone settings dialog.