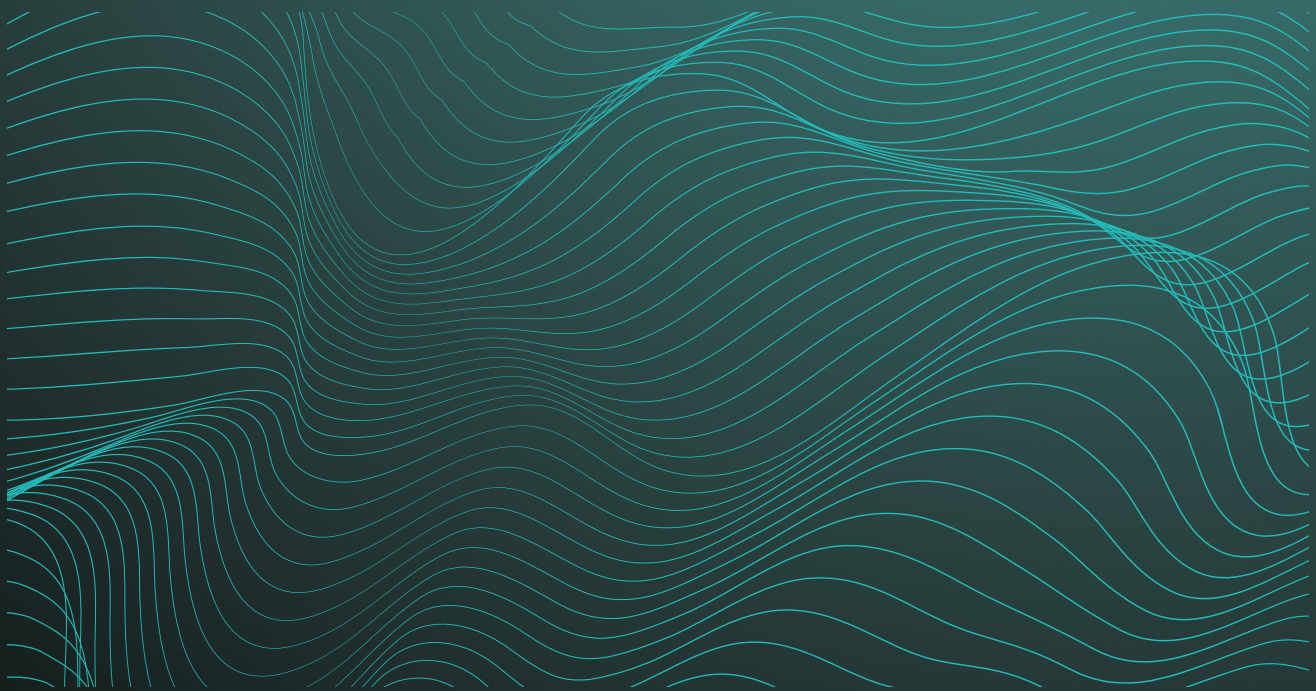


WASSP CDX OPERATORS MANUAL

V 6.0 ▶



SEE IT ALL

WASSP CDX OPERATORS MANUAL

WASSP CDX is control, visualisation, data management and data processing application for use with the WASSP DRX 'Black Box' multibeam transceiver.

This manual provides the basic information to operate WASSP CDX.

DOCUMENT REVISION HISTORY

REVISION DATE	REASON FOR CHANGE	VERSION
March 2016	Compilation	1.0
April 2016	Update Tides	1.1
April 2016	Typos Corrected	1.2
July 2016	Updates for V2	2.0
September 2016	Addition of 6.0 Tools and Utilities	3.0
November 2016	Update Appendix PC Specs	3.1
January 2017	Feature Updates for CDX V3	3.2
April 2019	CDX V4 Updates	4.0
September 2021	CDX V6 Updates	6.0

RELATED DOCUMENTS

- » WASSP CDX Operators Manual – For the latest version of this manual go to wassp.com
- » WASSP DRX Installation Manual – For the latest version of this manual go to wassp.com
- » WASSP DRX Utilities Operators Manual – Manual describing utility applications shipped with WASSP DRX.

Further documentation, FAQs, updated specifications and WASSP CDX Operators manual can be found at wassp.com

General Notices

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Support information

If you require maintenance or repair, contact your local dealer. You can also contact WASSP Ltd. using the following address: <http://wassp.com/contact-us/>

If you need information about WASSP products, visit wassp.com.

On the website you will also find a list of WASSP dealers and distributors.

Warnings, Cautions, and Notes

Warnings, cautions, and notes are indicated by the following icons throughout this manual:



CAUTION indicates that if the instruction is not heeded, the action may result in equipment damage or software corruption.



NOTE indicates a TIP or additional information that could be helpful while performing a procedure.

GLOSSARY

Term	Description
CSM	Content Sensitive Menu.
DHCP	Dynamic Host Configuration Protocol, for automatically providing IP addresses.
DRX	'Black Box' smart transceiver that interfaces to devices and sensors to make up the WASSP sounder system.
GbE	Gigabit Ethernet.
IMU	Inertial Motion Unit/Motion Sensor, typically for roll, pitch and heave.
LAN	Local Area Network.
Pan	Refers to horizontal and vertical scrolling of the Display panel.
RTK GPS	Real Time Kinematic GPS, used for high quality positioning.
Zoom	Refers to changing the scale of the Display panel.

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1 SYSTEM CONFIGURATION

1.1. SYSTEM OVERVIEW

Details on WASSP system configuration can be seen in the DRX Installation Manual, with a typical configuration shown below.

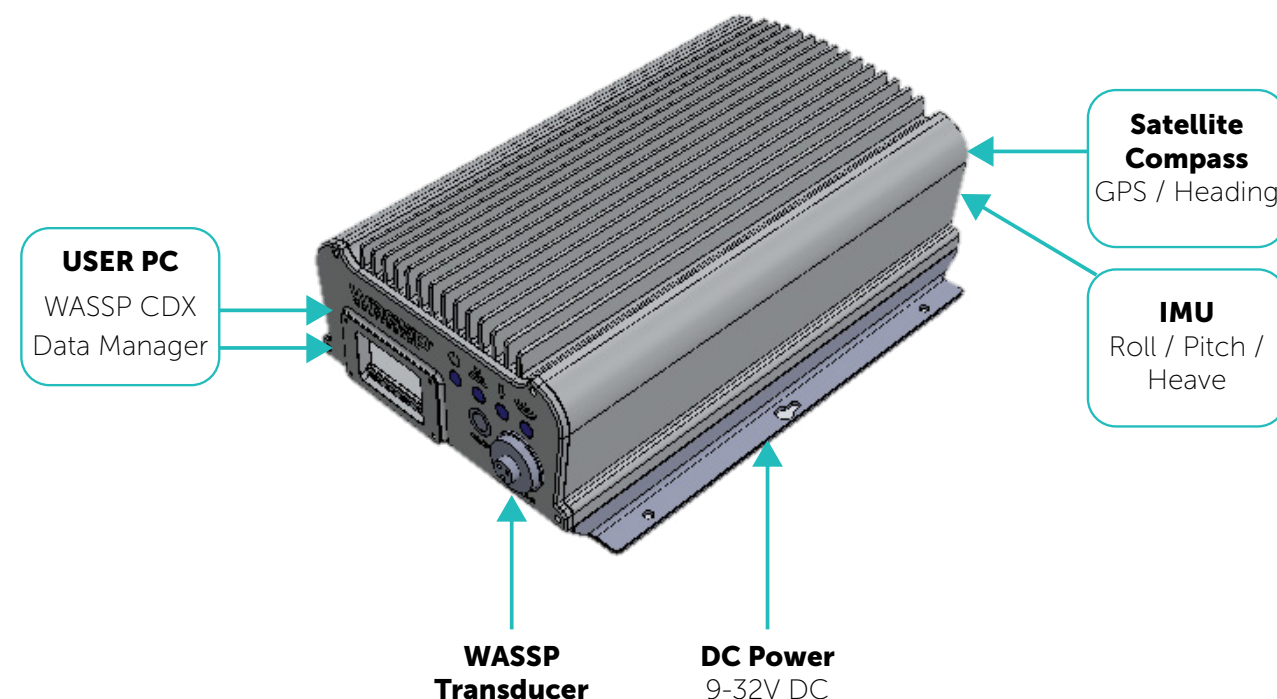


Figure 1. DRX Recommended System

WASSP CDX is connected to DRX over gigabit Ethernet. The Ethernet link is used for all communication between WASSP CDX running on PC or other devices and the DRX. This link is used for control of the DRX and for the DRX to supply data for visualisation, management and post processing to WASSP CDX.

DRX also serves DRX SETUP WEBPAGES for DRX configuration. This is described in the DRX Installation manual.

The Ethernet connection can be connected either directly using crossover cable or auto crossover (DRX supports auto MDI/MDI-X) OR via a network switch if supporting multiple clients or running the DRX on vessel LAN (local area network).

If there is a DHCP server on the LAN the DRX will be assigned an appropriate IP address by the DHCP server. If there is no DHCP server, the DRX will fall through to Zero-configuration assignment in block 169.254.0.0/16. Any connected device will need to be assigned an appropriate IP address on the same subnet as the DRX, either via DHCP server, Zero-configuration or fixed IP.

The Data Manager application bundled with the WASSP CDX Install Package is used for recording DRX data, exporting to various formats and data playback to supported applications including WASSP CDX.

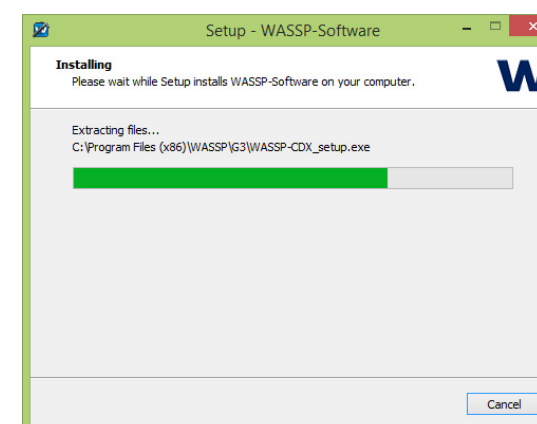
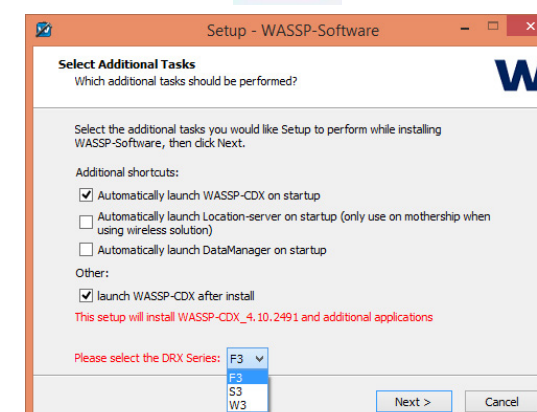
1.2. INSTALLATION

WASSP CDX can be installed on any device that meets the minimum spec described in "Appendix A - PC" on page 78.

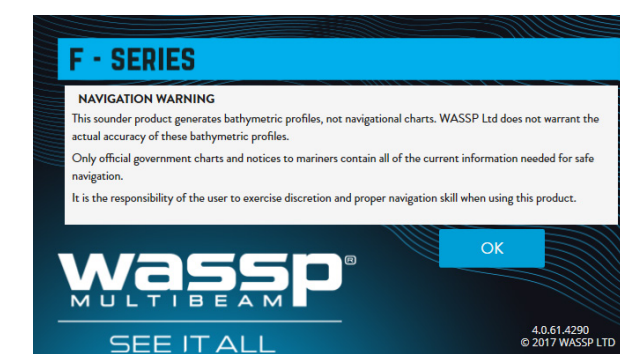
1. From **WINDOWS START** run **WASSP CDX SETUP**.



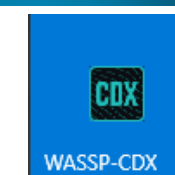
- » Tick your required shortcuts.
- » Select your DRX Series.
- » Select **NEXT**.



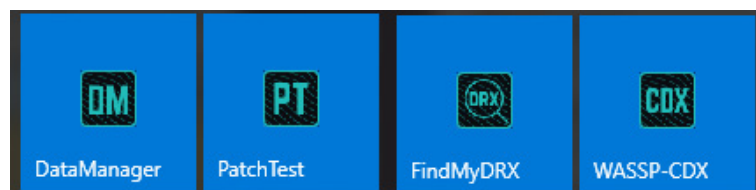
- » Select **OK**.



2. You may now run the **WASSP CDX** Application.



WASSP CDX installer will also install various utilities including:



- » Data Manager; For data record, export and playback.
- » Patch Test; For automated Patch Test to calculate roll offset.
- » Find My DRX; For identifying DRXs on the network.

1.2.1. Upgrade to CDX V4

Upgrading from CDX V3 or below to CDX V4 or above requires a full Mapping Database update. This is a one off operation and will involve updating available mapping databases to be compatible with CDX V4 and above.

CDX will automatically detect mapping databases requiring updating:

- » on CDX installation or upgrade
- » on CDX start-up

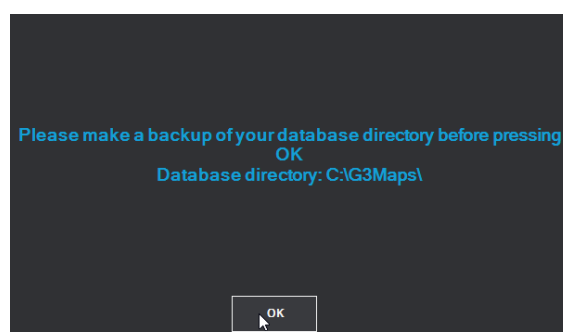
If the mapping database is not updated the mapping data will not be available in CDX.

Prior to installing or upgrading CDX, mapping databases should always be backed up. Backup can be done by closing down CDX and copying databases to a backup location or by using an appropriate backup utility.

When CDX detects a database requiring updating, the following sequence will happen:

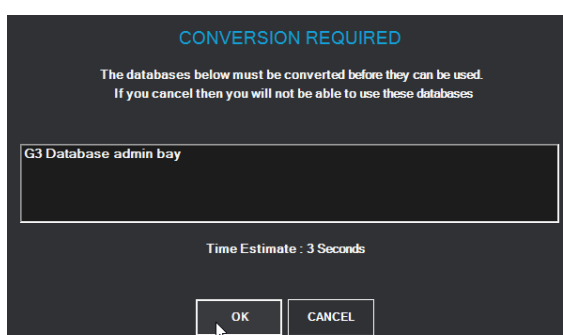
CDX will prompt for databases in the current active location to be backed up.

- » Once all databases are backed up select **OK** to continue with the update process.



CDX will list any databases that need updating and will give a time estimate to do the update.

- » Selecting **CANCEL** will cancel out of the database update.
- » Select **OK** to continue with the update process.

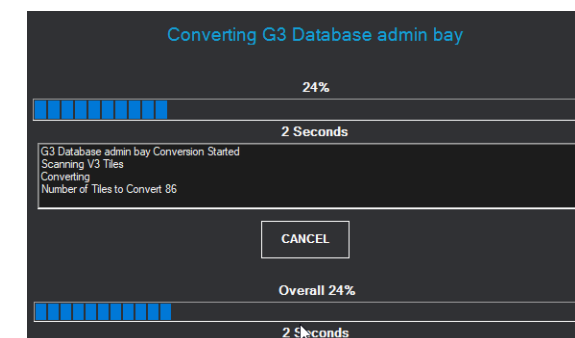


If a database does not need to be updated it can be archived by removing it to a separate location so that it does not appear in the list. This database will no longer be available to CDX.

An archived database can be restored to the database location at a later stage. It will then be detected by CDX as requiring update on the next CDX start-up.

During the database update process progress will be shown for each database and for overall progress.

Database update time will depend on database size and PC specification, but will also be impacted by any other applications or processes running during the update. A large database can take many hours to update.



The database update process can be cancelled at any time by using **CANCEL**. If **CANCEL** is used, databases that have completed update will be available in CDX but databases that have not been completed will not be available until they are updated.

If any databases are not updated, CDX will prompt for update on the next start-up.

If no databases are updated, CDX will create a new default V4+ database which will be used for mapping.



NOTE: Databases' update time will depend on the size of the database to be updated and the PC specification, but will also be impacted by any other applications or processes running during the update.

If it is not feasible to run a database update and that database is required for operations, CDX will need to be reverted to a version prior to V4.

2 APPLICATION OVERVIEW

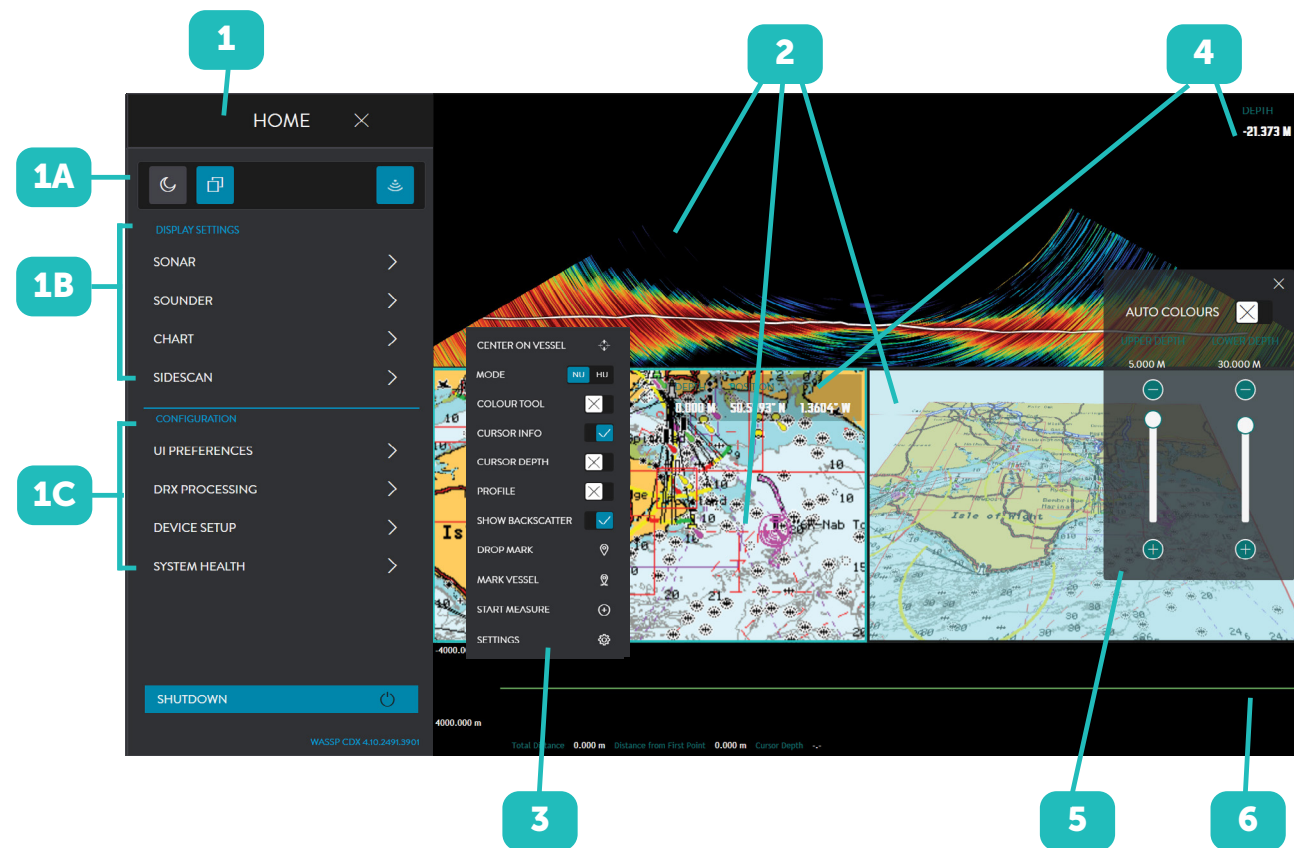


Figure 2. Application Overview

- 1 HOME BAR**

Provides configuration options for the Display Panels, Layout, Tools, System Setup and User Preferences. The **HOME** bar is accessed through the **HOME** button.

1A: Quick Access Bar:
See "2.1. Quick Access Bar" on page 11.

1B: Display Panel Setup:
See "3.5. Layout" on page 39.

1C: Configuration of CDX (**UI PREFERENCES**), DRX (**DRX PROCESSING**) system setup (**DEVICE SETUP**) and **SYSTEM HEALTH**. See "3 System Set Up" on page 13.
- 2 DISPLAY PANELS**

Display panels are associated with specific data types for visualisation and control. Typical examples are Charting for bathymetric display and Sonar for multibeam swath data. Display panels available will depend on data available to CDX. Display panels are configured in **LAYOUTS**, 1A.
- 3 CONTEXT SENSITIVE MENU (CSM)**

Set up and configuration of the specific Display Panels accessed through right-click on any panel.

- 4 INFORMATION DISPLAY**

Optional Display Panel information overlay enabled from CSMs. Information Display Panels can be selected and dragged to any position within the Display Panel.
 - 5 CONTROL TOOLS**

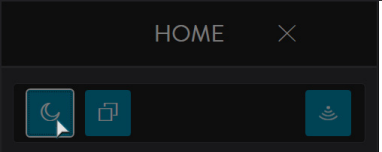
Optional Display Panel control overlay enabled from CSMs.
 - 6 TOOL BARS**

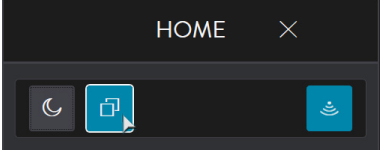
Optional general data display tools enabled from CSMs.
- NOTE:** CDX will expose functionality that is available to the user. All functionality described in the manual may not be available depending on DRX model and feature licensing. Disabled controls indicate that the data may be enabled through upgrade or feature licensing.

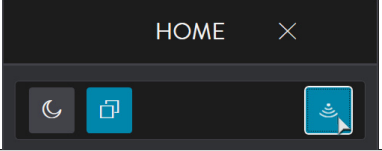
2.1. QUICK ACCESS BAR

The **QUICK ACCESS BAR** is used to access top level options.

- DAY / NIGHT** button. Used for display brightness configured in layout, 1A. See "3.3.6. Night Mode" on page 34 for full control.


- LAYOUTS** button see "3.5. Layout" on page 39 for Display Panel selection.


- TRANSMIT** button. DRX control to transmit. Ping rate will be determined by selected range.



2.2. SHORTCUTS

F1	DROP MARK at vessel
F2	Toggle CONTOUR LINES and DEPTH VALUES on / off
F3	AUTO SCALE to view for mapping and backscatter (in auto mode switch to manual and scale)
F4	CENTER ON VESSEL
F5	Toggle between BACKSCATTER and DEPTH MAPPING
F6	Toggle MAPPING on / off
F7	Toggle WATER COLUMN TARGETS on / off
F8	Toggle REMOVAL MODE
F9	ZOOM IN on chart
F10	ZOOM OUT on chart
F11	Toggle full screen on / off
SHIFT + F12	Toggle WASSP logo on / off

3 SYSTEM SET UP

3.1. DEVICE SETUP

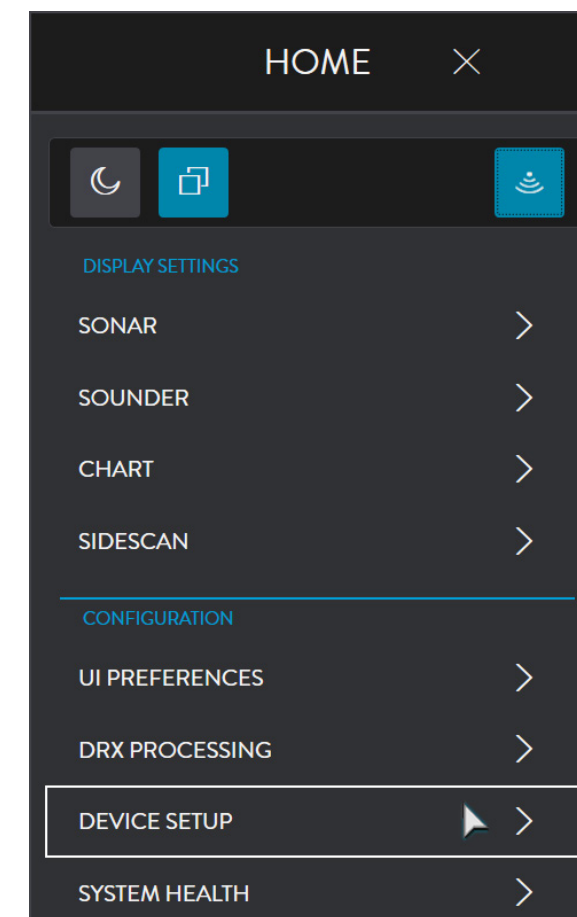
For full details on network configuration see DRX Installation Manual.

After installing the WASSP CDX on your PC, start the DRX and run WASSP CDX.

WASSP CDX will automatically select the DRX as long as the network has been correctly configured.

DEVICE SETUP allows further setup configuration including:

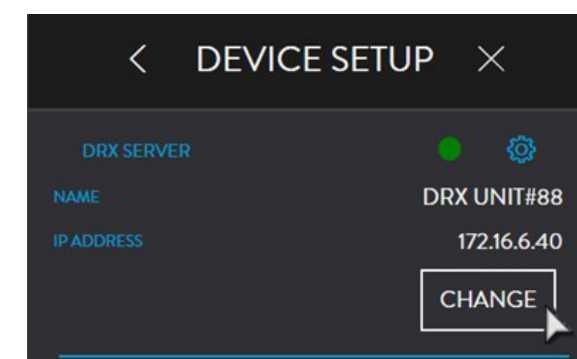
- » DRX selection.
- » Wireless configuration.
- » Interfacing CDX to 3rd Party Applications.



3.1.1. DRX Server

The DRX SERVER section displays the current (or previous) DRX connection.

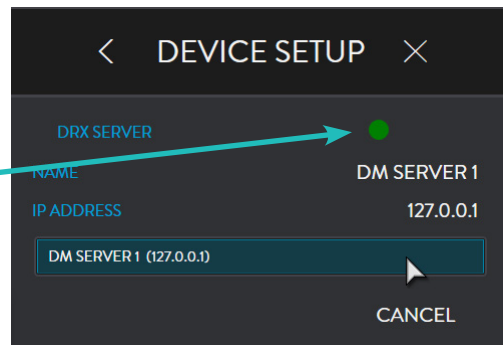
Press CHANGE and a drop-down list of available connections will be displayed.



Select your desired connection.

The connection indicator will display the following depending on the current status of the connection:

- » GREEN: Connected.
- » AMBER: Connection is being changed.
- » RED: No connection.



NOTE: Other WASSP data servers such as Data Manager can also be selected as a DRX Server.

For information on recording and playing back data files see *"6 Data Manager" on page 75.*

3.1.2. Wireless Set Up

WASSP CDX can be configured to be used in a wireless configuration for remote mapping being transmitted from the **WIRELESS SERVER** (typically the tender) to the **WIRELESS CLIENT** (typically the mother ship). The mapping data from the **WIRELESS SERVER** will be transmitted to the **WIRELESS CLIENT** real-time as well as off-line when the **WIRELESS SERVER** goes out of wireless range for a period of time.

To enable wireless configuration the **WIRELESS SERVER** DRX requires a Wireless License installed and the **WIRELESS CLIENT** needs to run **CDX** and **DATAMANAGER** on the same PC with a WASSP USB dongle with Wireless license installed.



NOTE: To enable Wireless either a Wireless License on the WASSP USB Dongle or a Wireless license on the DRX where DataManager is connected is required.

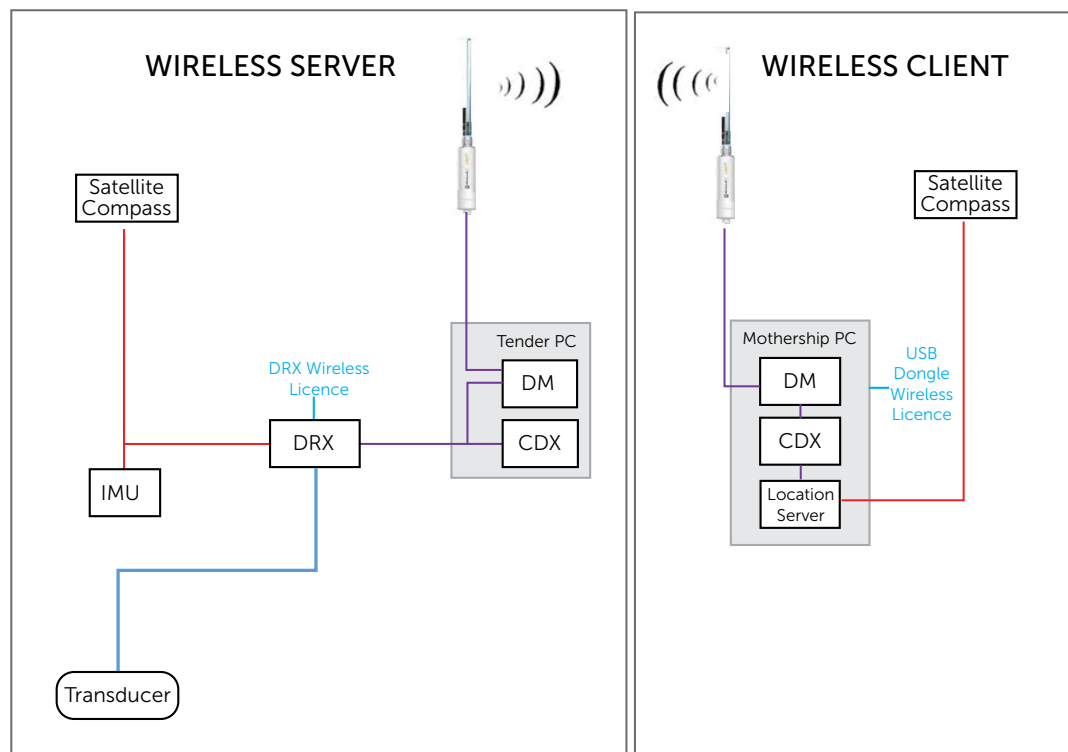
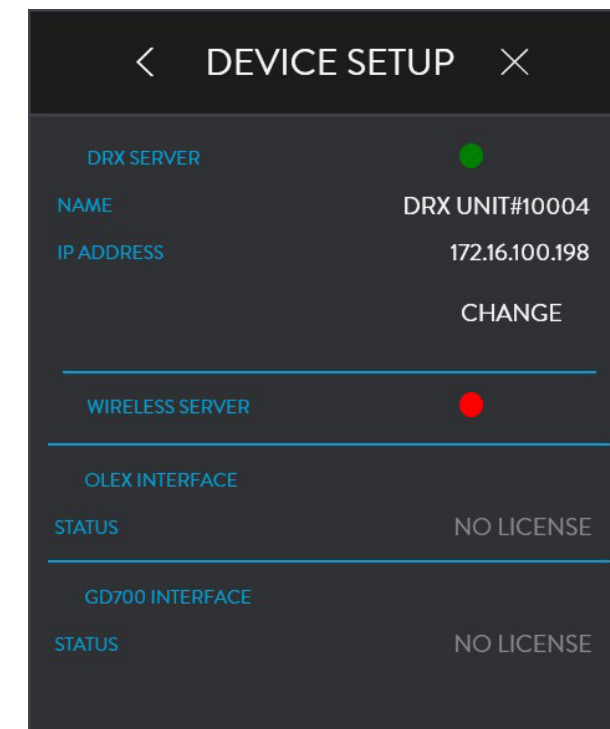


Figure 3. Typical Wireless Setup

With a Wireless License **WIRELESS SERVER** will be available under **DEVICE SETUP**. Setting up for wireless connectivity consists of:

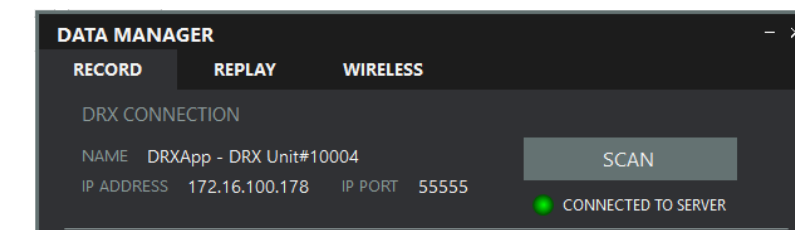
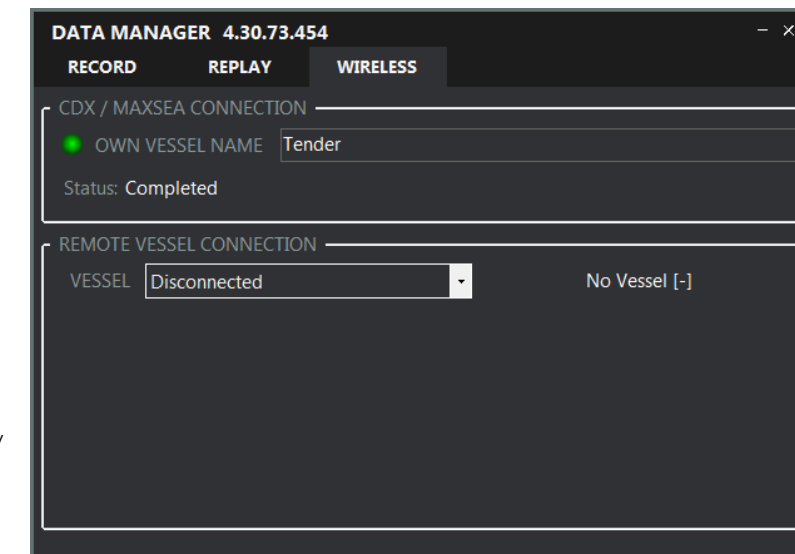
- » Setting up the **WIRELESS SERVER**, see *"3.1.2.1. Setting up the Wireless Server (Tender)" on page 15.*
- » Setting up the **WIRELESS CLIENT**, see *"3.1.2.2. Setting up the Wireless Client (Mother ship)" on page 16.*
- » Configuring the **WIRELESS CLIENT** for receiving own vessel navigation data see *"3.1.1.2. Configuring the Primary Vessel" on page 15.*



3.1.2.1. Setting up the Wireless Server (Tender)

Run **DATAMANAGER** on the **WIRELESS SERVER** and it will automatically connect to the DRX. The **WIRELESS** tab will be available if the Wireless license is installed.

1. Enter the nominated name of the **WIRELESS SERVER** under **VESSEL NAME**. This will be used to identify the vessel for all wireless operations and will be the name used to identify the vessel by **WIRELESS CLIENT** vessels. The name selected here is 'Tender'.
2. **WIRELESS VESSEL** is typically not used for the **WIRELESS SERVER**.
3. **SCAN** and connect to the DRX using the **RECORD** Tab, see *"6 Data Manager" on page 75.*

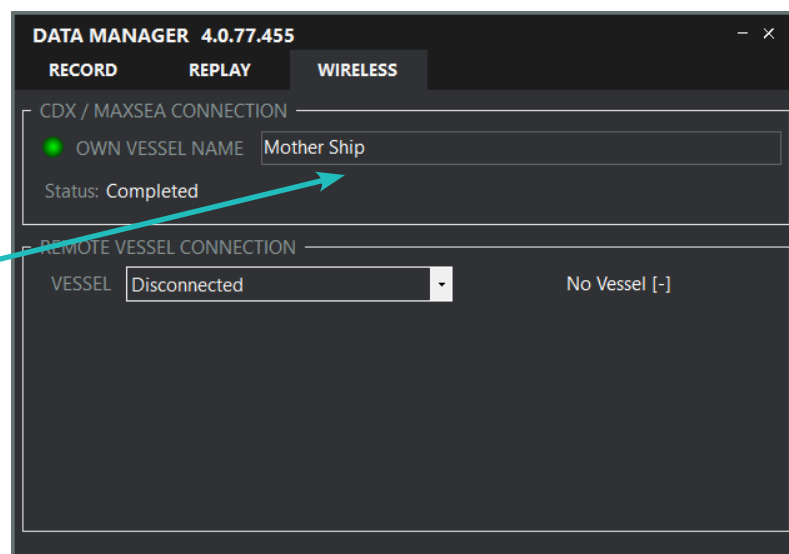


NOTE: WIRELESS does not require pressing the RECORD button, however the DRX should be connected on the RECORD TAB.

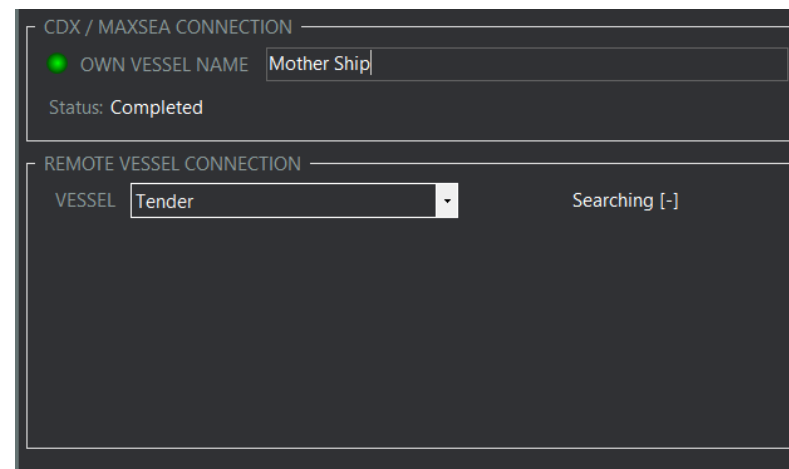
3.1.2.2. Setting up the Wireless Client (Mother ship)

Run **DATAMANAGER** on the **WIRELESS CLIENT**. The **WIRELESS** tab will be available if the Wireless license is installed.

1. Enter the nominated name of the **WIRELESS CLIENT** vessel under **VESSEL NAME**. This will be used to identify the vessel for wireless operation. The vessel name selected here is 'Mother Ship'.



2. Select the name of the **WIRELESS SERVER** from the drop-down list under **WIRELESS VESSEL**. In this case 'Tender' is selected as the active server. All available **WIRELESS SERVERS** on the network will be visible and available for selection.



WIRELESS VESSEL STATUS will show as:

- » **NO VESSEL**; No vessel available for connection.
- » **SEARCHING**; Searching for vessel.
- » **SYNCING**; Vessels synchronising connection.
- » **CONNECTED**; Connection established.
- » **READY TO CONNECT**; Connection available but not connected.
- » **OUT OF RANGE**; Connection was established but subsequently lost.

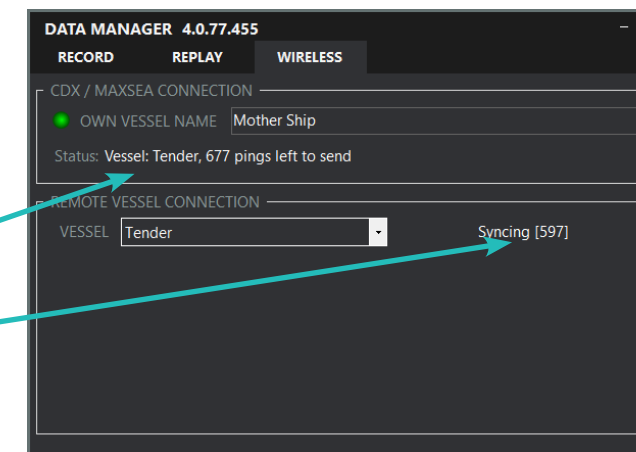


NOTE: The number in brackets is the number of packets received from the wireless vessel.

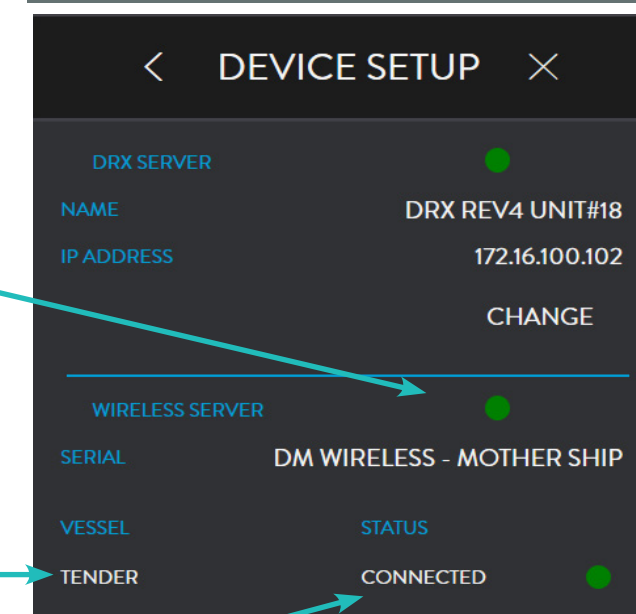


NOTE: While **SYNCING** after being **OUT OF RANGE**, **WIRELESS** will indicate pings. For example:

677 pings left to send to the user interface e.g. CDX or TimeZero
597 pings to be received from the wireless vessel



3. Run **CDX**. **CDX** will automatically connect to the local DataManager with wireless enabled.
4. Select **DEVICE SETUP**.
5. The DataManager connection will be indicated by the **WIRELESS SERVER** icon and will show the DataManager name as selected under "3.1.2.2. Setting up the Wireless Client (Mother ship)" on page 16.
6. All available **WIRELESS SERVERS** and their current status will be shown under **VESSEL**. The **CONNECTED WIRELESS SERVER** will map to CDX.



WIRELESS VESSEL STATUS will show as:

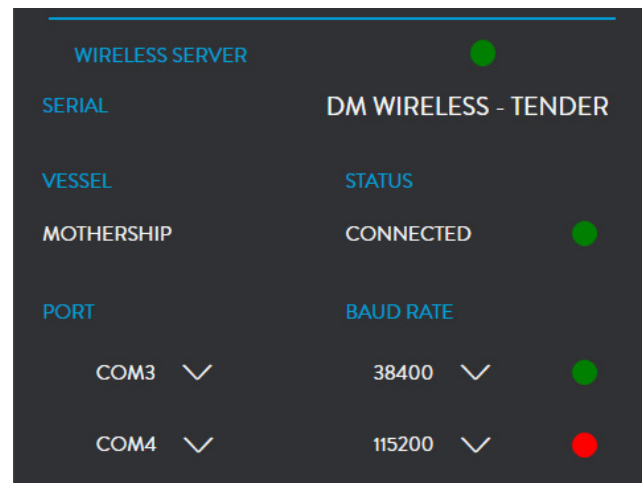
- » **SEARCHING**; Vessel is configured and connection is establishing.
- » **CONNECTED**; Vessel is in range.
- » **OUT OF RANGE**; Vessel is Out Of Range and data cannot be synced at that moment.

To set up **WASSP CDX** on the Wireless Client to display own vessel position and heading configure the **PORT** and **BAUD RATE** under the **WIRELESS SERVER** section.

Own vessel position and heading data will require connection from a supported sensor and sentence, see "Appendix B - NMEA supported sentences" on page 79.

See "Figure 3. Typical Wireless Setup" on page 14 for configuration setup.

Connection will typically be using a serial connection either directly or using a serial to USB adapter connected to the CDX PC. Once the connection between the sensor and PC is established configure the port(s) under the **WIRELESS SERVER** section. CDX supports 2 ports for own vessel data. CDX will automatically connect to the position and heading data from the serial ports and display Own Vessel Position.

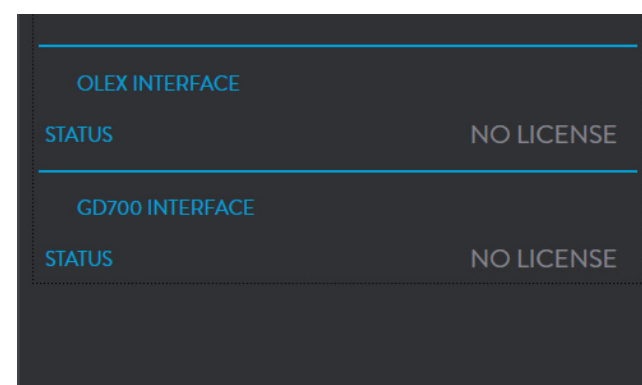


3.1.3. Client Interfaces

Client Interfaces show available 3rd party interfaces and licence status. In order to enable **OLEX INTERFACE** or **GD700 INTERFACE** a licence is required.

When enabled CDX will act as a data server and transmit all required data for the 3rd party application.

For details on configuring the 3rd party application refer to the WASSP Knowledge Base.

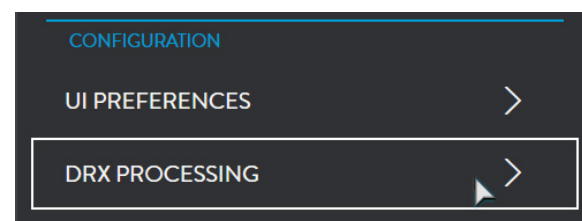


3.2. DRX PROCESSING CONFIGURATION

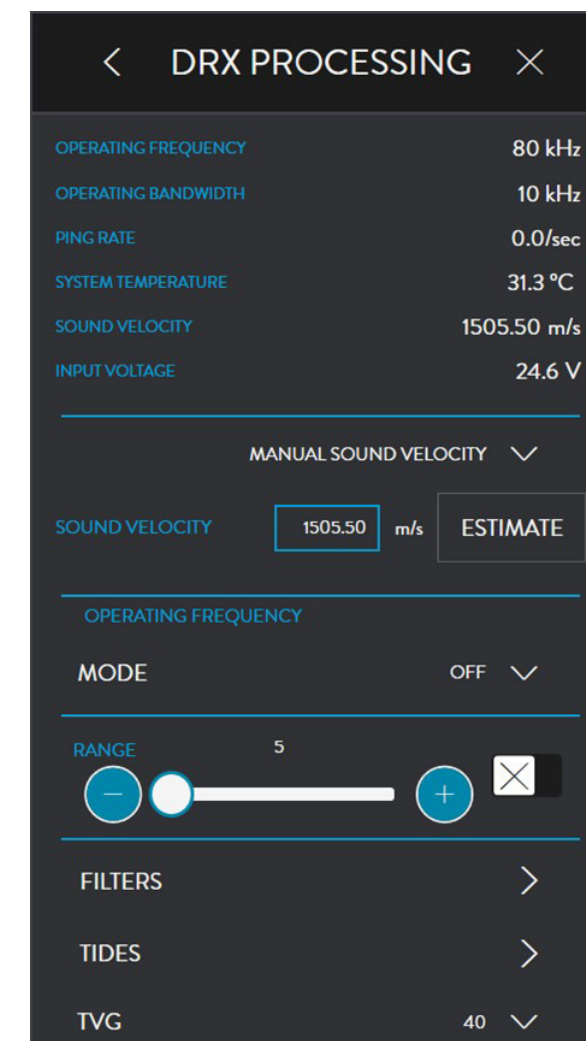
3.2.1. DRX Information

The **DRX PROCESSING** menu is used for monitoring DRX status and configuring DRX specific processing and control options.

From the **HOME** bar, under **CONFIGURATION** select **DRX PROCESSING**.



DRX information displays general status information. This information is specific to the DRX or data server that CDX is connected to.



3.2.2. Sound Velocity

Sound velocity input is required to compensate for range inaccuracies caused by sound speed variations. These changes can occur both seasonally and with geographical areas especially in coastal areas where sound velocity will be impacted by both temperature and water salinity differences.

Sound velocity in water is affected by both temperature and salinity and can either be measured directly or derived from temperature and salinity. This value should be adjusted regularly, depending on the operating environment, as it will have a direct impact on mapping accuracy.

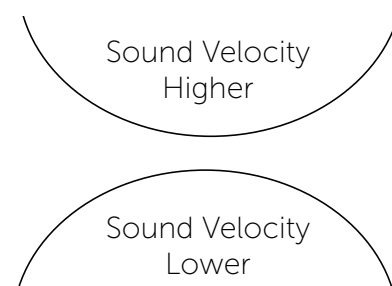
The sound velocity control allows for both direct and derived values. Sound velocity compensation can be calculated using appropriate sound velocity, sound velocity profile or temperature and salinity sensors. The more accurate the sound velocity the more accurate the mapping.

The visual effect of incorrect sound velocity is that a flat seafloor will either curve up or curve down. This representation will indicate soundings that are too shallow or too deep with the affect being accentuated toward the edges of the swath.

Sound velocity measurements can be manually reckoned using the sonar display, *see "4.1. Sonar" on page 40* or the profile tool, accessed through the Chart CSM, *see*

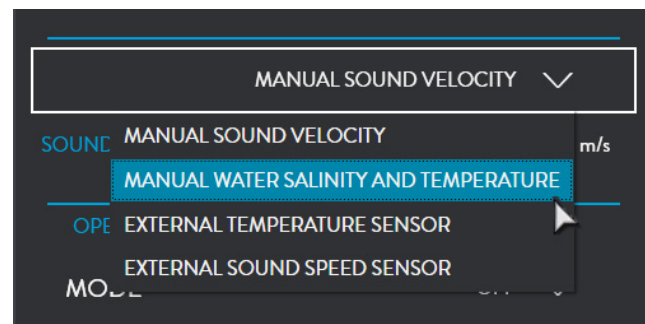
"4.3.2. 2D Chart CSM" on page 63. To do this:

- » Known flat sea floor should be run over.
- » If the sea floor appears to be curving upwards at the edges (smile), the sound velocity value used is higher than the real sound velocity profile.
- » If the sea floor appears to be curving downwards at the edges (frown), the sound velocity value is lower than the real sound velocity profile.

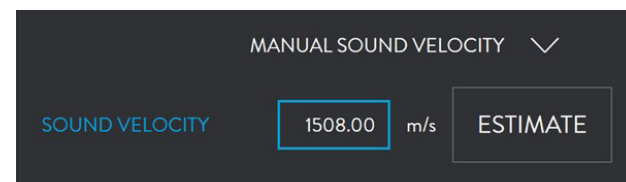


NOTE: Seafloor can be seen on the SONAR SEAFLOOR line (see "4.1.1.3. Display" on page 43) or the BATHYMETRY Profile tool (see "5.2. Measure Tool" on page 74).

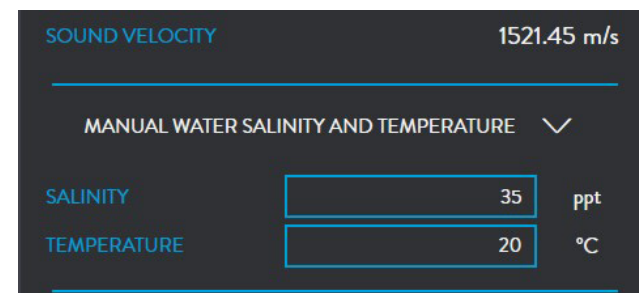
Click on the drop down menu and select the option you wish to tune: **MANUAL SOUND VELOCITY**; **MANUAL WATER SALINITY AND TEMPERATURE**; **EXTERNAL TEMPERATURE SENSOR** or **EXTERNAL SOUND SPEED SENSOR**.



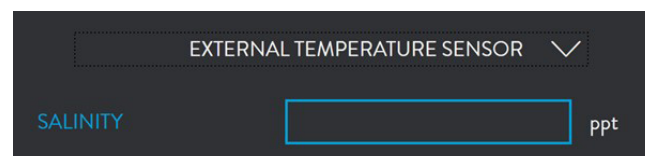
MANUAL SOUND VELOCITY; used if sound velocity is known. Selecting **ESTIMATE** will trigger the DRX to estimate the sound velocity when driving over a known flat area.



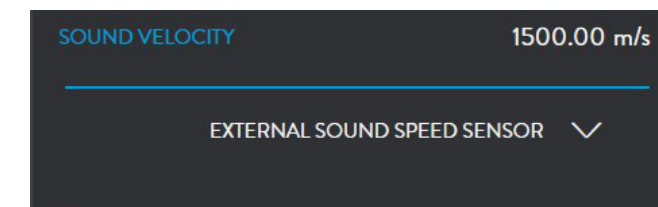
MANUAL WATER SALINITY AND TEMPERATURE; if temperature and salinity are known, these will be used to derive sound velocity in DRX.



EXTERNAL TEMPERATURE SENSOR; can be used if DRX has a temperature sensor connected and configured. The manual salinity input will be used to derive the sound velocity.



EXTERNAL SOUND SPEED SENSOR; used if an external sound speed sensor is connected directly to the DRX. Refer to DRX installation manual for configuring sensors connected to the DRX.



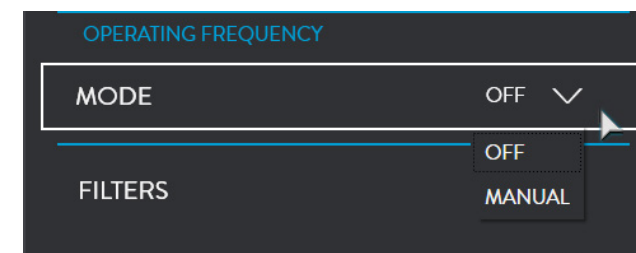
NOTE: The default value for the salinity of sea water is 35ppt. This value should not be changed unless the actual salinity of the surrounding water is known. If in fresh water, the value should be set to 1.

NOTE: Temperature input into DRX may be direct from transducers with temperature sensors built in or from external temperature sensor.

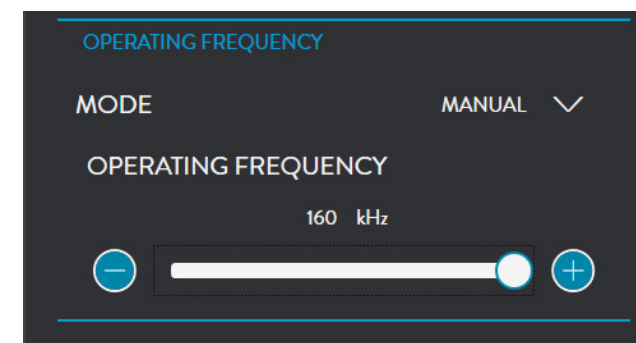
3.2.3. Operating Frequency

OPERATING FREQUENCY is used for managing interfering acoustic equipment.

Choose between **OFF** or **MANUAL**.



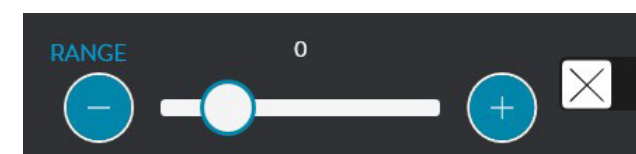
MANUAL mode allows basic control of operating center frequency and can be used to manually adjust frequency to avoid acoustic equipment operating in the same frequency band as DRX.



3.2.4. Range

RANGE AUTO sets the range automatically to the depth.

RANGE MANUAL allows the user to manually set the range. This is especially useful if auto does not work due to interference or when the bottom is deeper than the WASSP maximum detecting range.

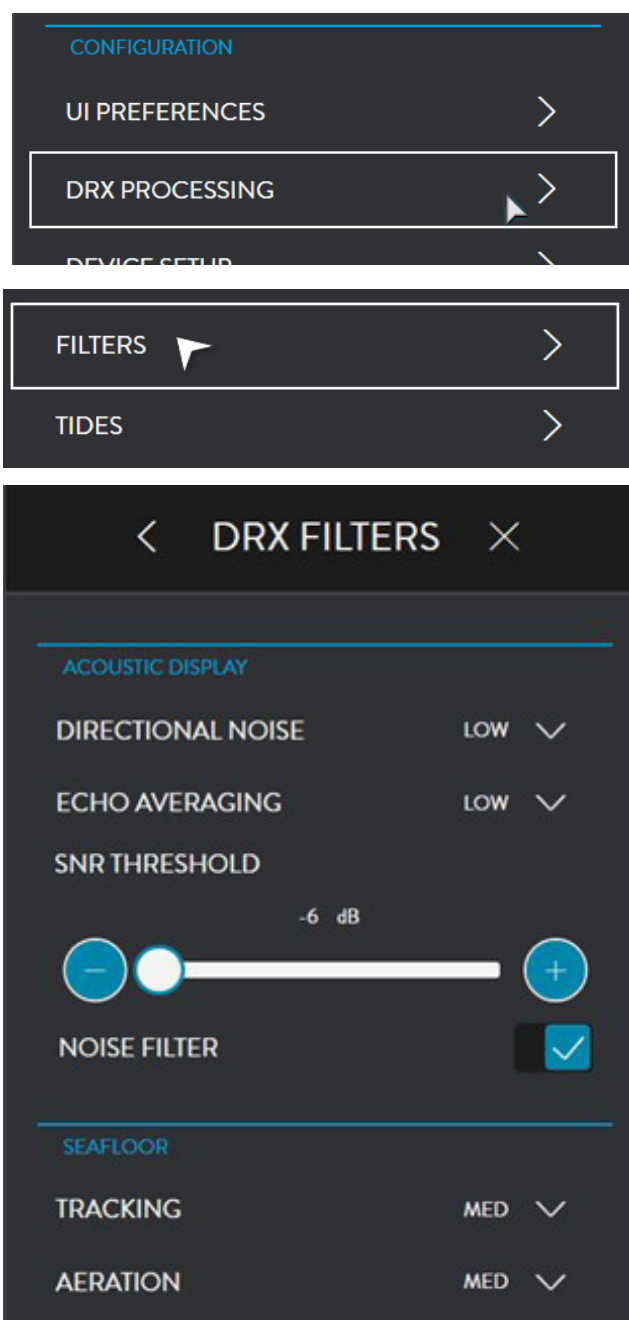


3.2.5. Filter Setup

DRX FILTERS allow adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality.

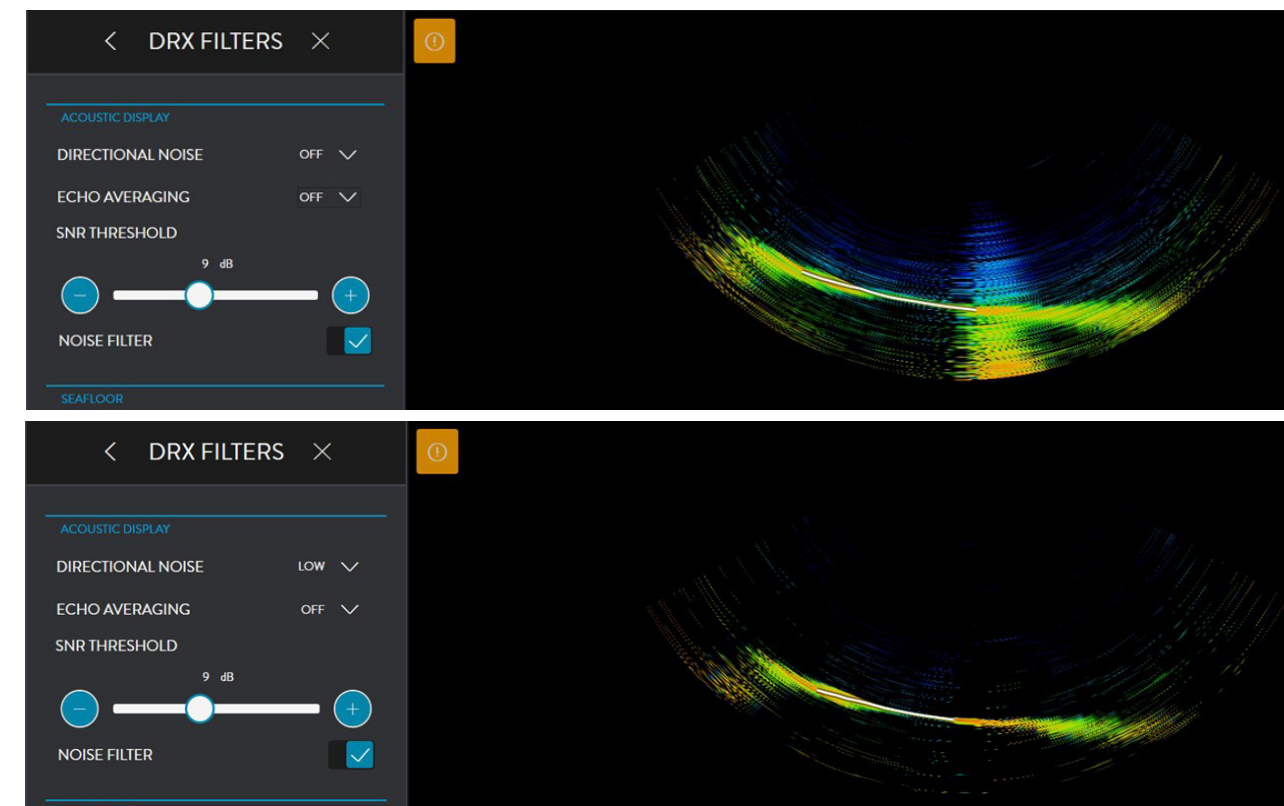
These filters are split into **ACOUSTIC DISPLAY** for filters impacting sonar and sounder displays and **SEAFLOOR** for filters impacting Bathymetry on charting displays.

- From the **HOME** bar, under **CONFIGURATION** select **DRX PROCESSING**.
- Select **FILTERS**.



3. ACOUSTIC DISPLAY: DIRECTIONAL NOISE

DIRECTIONAL NOISE detects constant noise coming from a specific direction in the sonar data. The source of the torch could be caused by electrical interference from the rotation of the shaft, general boat vibration or other electrical interference sources. It is always recommended to remove the source of the problem first but if the problem can not be resolved the directional noise can hide the noise by slowly increasing the SNR until the interference is removed.



NOTE: Please ensure that unit is properly grounded first

4. ACOUSTIC DISPLAY: ECHO AVERAGING

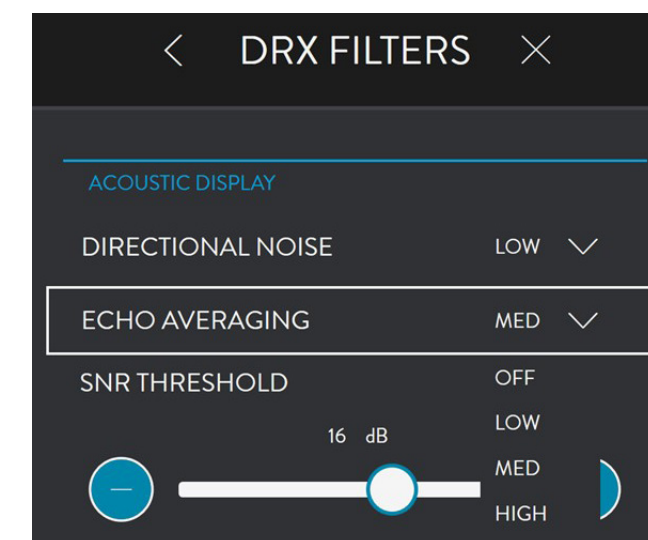
Applies to Sonar and Sounder data.

Purpose;

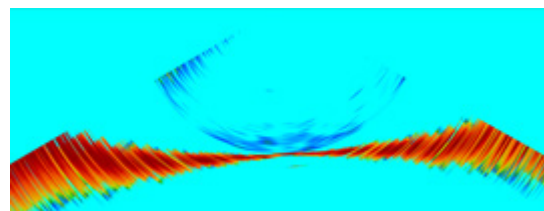
Reduction of clutter and false targets. Rejects small targets or fast changing data accentuating slow moving targets.

Disadvantage;

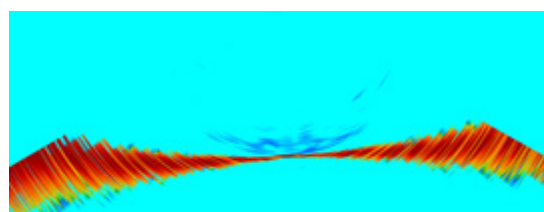
- » Small targets will be lost.
- » Display is out of calibration for target strength.



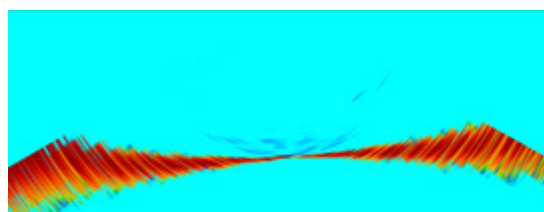
Example; OFF



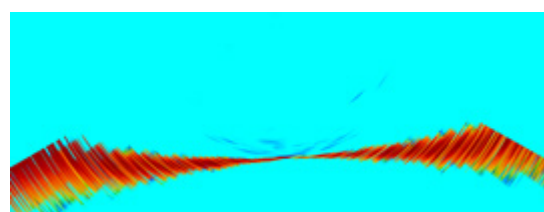
Example; LOW



Example; MEDIUM



Example; HIGH



5. ACOUSTIC DISPLAY: SNR THRESHOLD

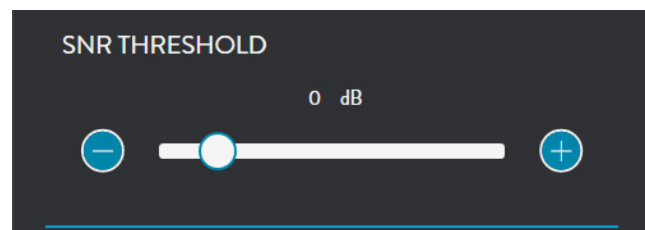
Applies to Sonar and Sounder data. **SNR THRESHOLD** is a threshold control to remove return signals below a specified level.

Purpose;

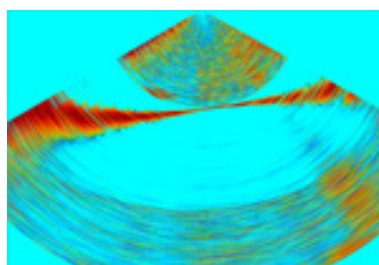
To clean the display of speckle by removing data below the specified threshold level. Allows stronger targets to be more easily identified.

Disadvantages;

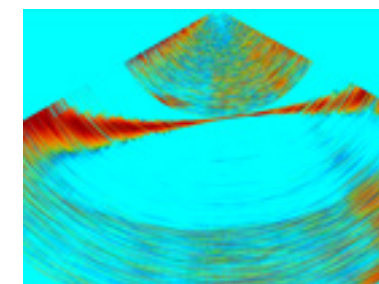
- » Removes targets dependent on threshold set.
- » Threshold is relative to noise level so targets may be lost with increased depth.



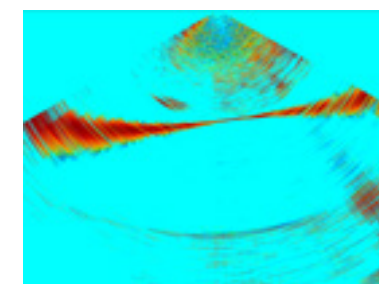
Example; -6dB



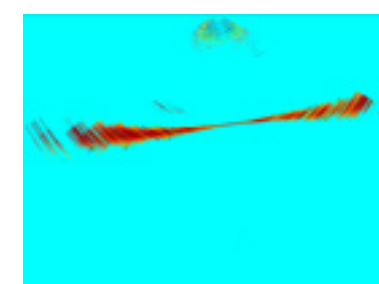
Example; +6dB



Example; +16dB



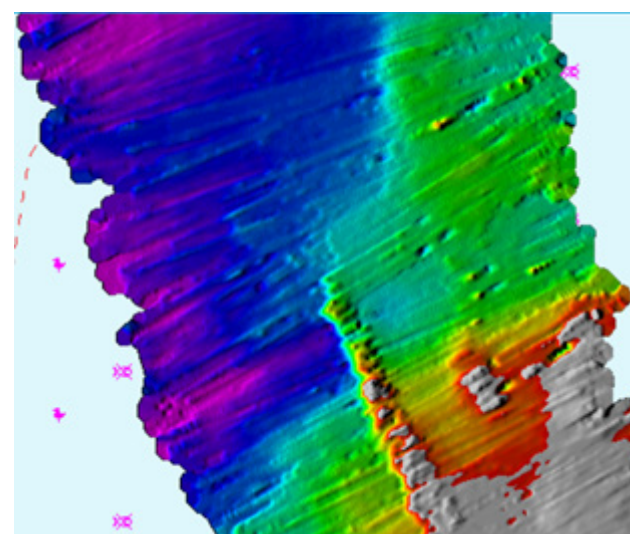
Example; +30dB



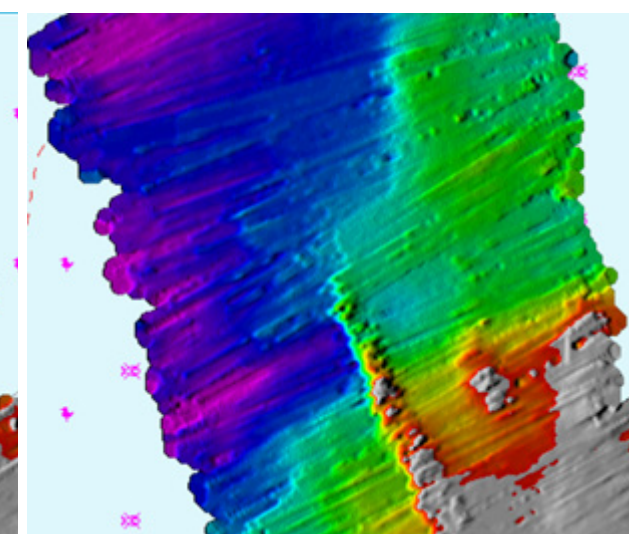
6. ACOUSTIC DISPLAY: NOISE FILTER

The noise filter removes detected sounder interference and identified system noise.

Example below; OFF



Example below; ON



7. SEAFLOOR: TRACKING

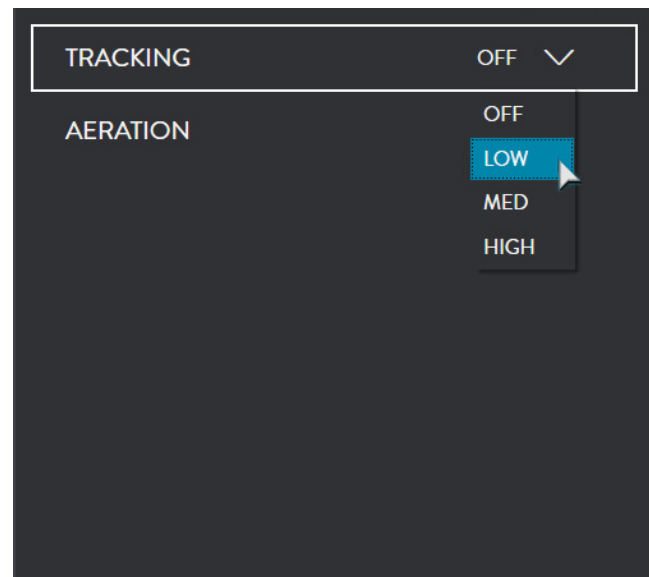
Applies to Bathymetry charting data.

Purpose;

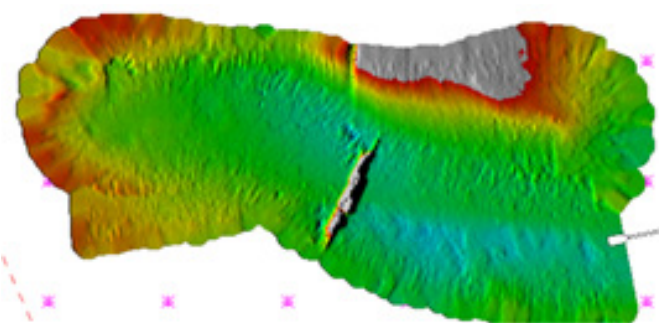
To prevent seafloor tracking artifacts such as fish schools and interfering sources such as sounders.

Disadvantages;

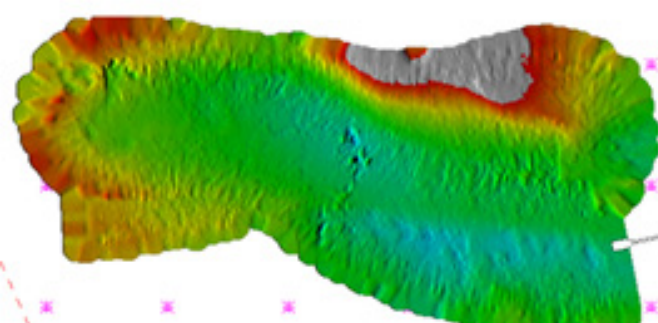
- » A very changeable seafloor may not be tracked effectively
- » Tracking while traveling at higher speeds may be compromised



Example below; OFF



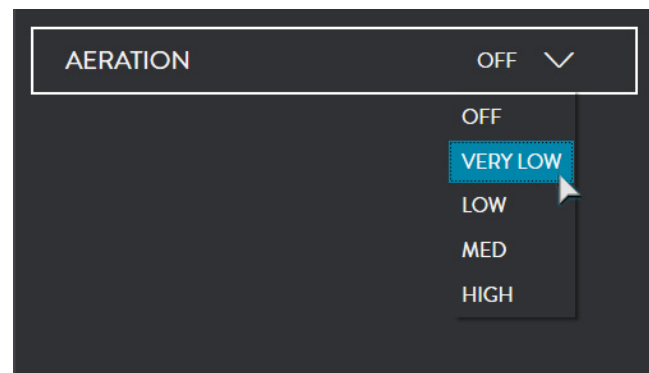
Example below; HIGH



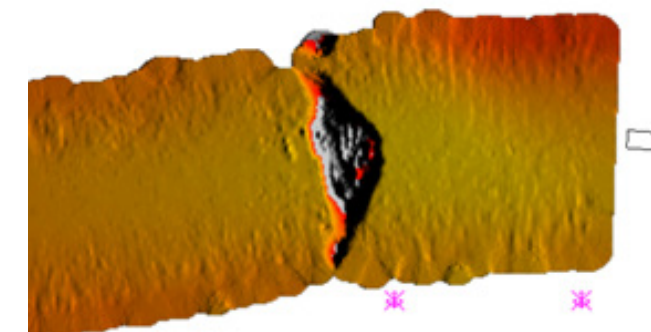
8. SEAFLOOR: AERATION

Applies to Bathymetry charting data.

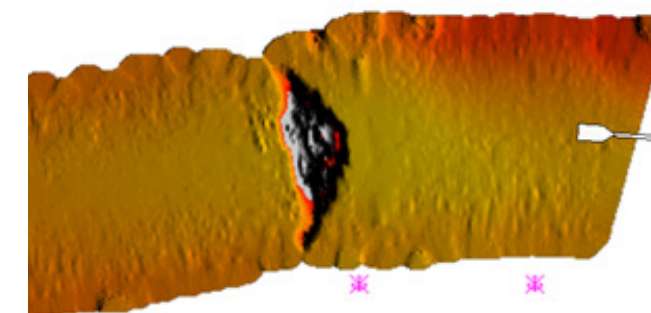
Aeration will occur due to air bubbles across the transducer face. This will occur due to poor transducer installation, but also due to sea conditions, vessel speed, vessel traveling astern etc. This can affect the entire swath or smaller areas.



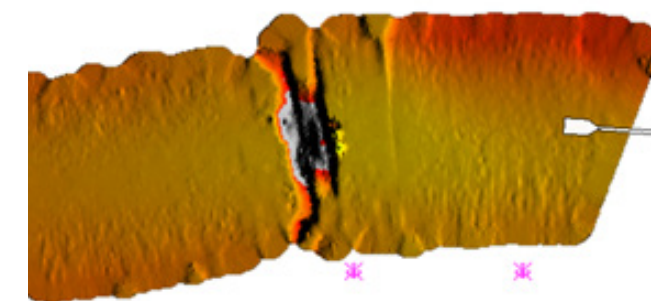
Example; OFF



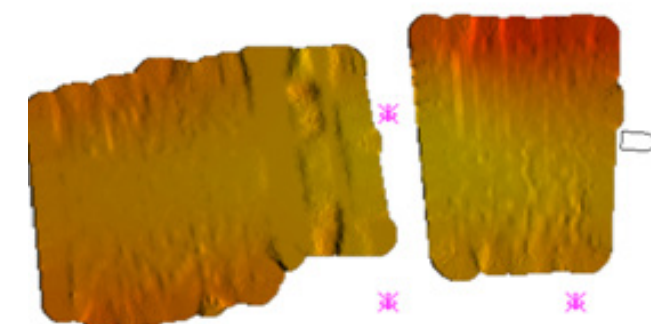
Example; LOW



Example; MEDIUM



Example; HIGH



Purpose;

To prevent aeration and other anomalies causing discontinuity in return signal strength from introducing poor seafloor tracking.

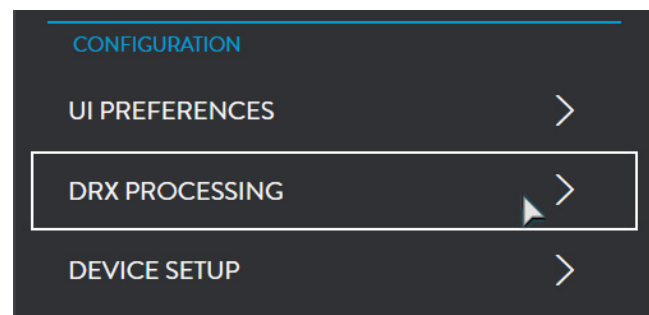
Disadvantages;

- » Good seafloor data may not be tracked.
- » Seafloor line on the Sonar display will be interrupted when aeration is detected.
- » Bathymetry will have gaps or be smoothed when aeration is identified.

3.2.6. Tides

Tidal height offset can be configured to be applied as a depth correction in the DRX. This will depend on the tide option set in the **TIDES** menu.

- From the **HOME** bar, under **CONFIGURATION** select **DRX PROCESSING**.



- Select **TIDES**.

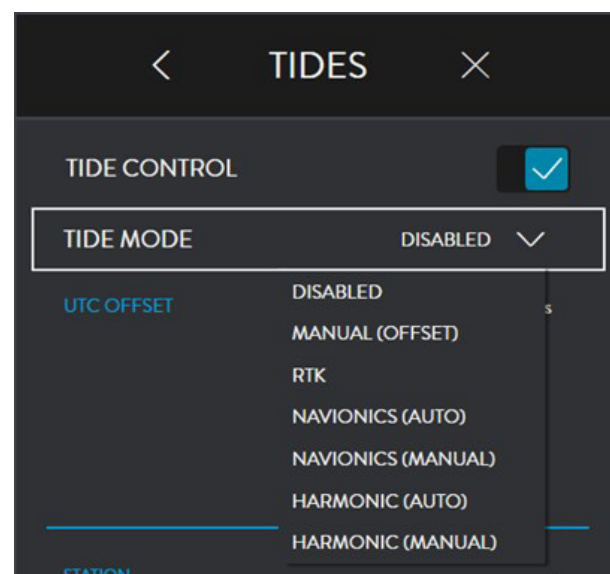
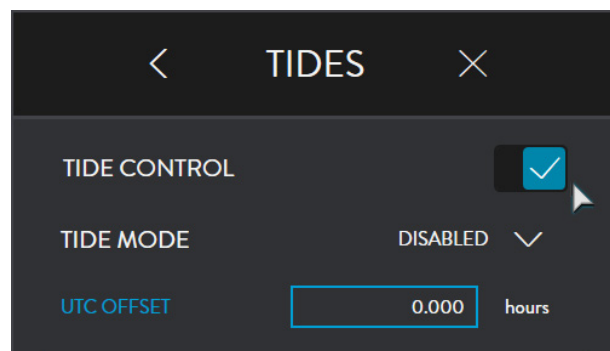


NOTE: NAVIONICS (AUTO), HARMONIC (AUTO) and MANUAL (STATION) require appropriate cartography containing tidal station information. Use a Navionics SD card to use these modes.

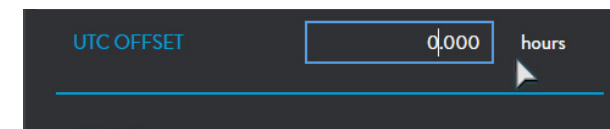
When **TIDE CONTROL** is disabled DRX tidal data is not updated by CDX. On initially setting **TIDE CONTROL** to **OFF** the DRX tide value will be set to zero.

When **TIDE CONTROL** is enabled CDX will set the DRX tidal level as per the options below.

TIDE MODE will provide you with the following options: **DISABLED**, **MANUAL (OFFSET)**, **RTK**, **NAVIONICS (AUTO)**, **NAVIONICS (MANUAL)**, **HARMONIC (AUTO)** or **HARMONIC (MANUAL)**.

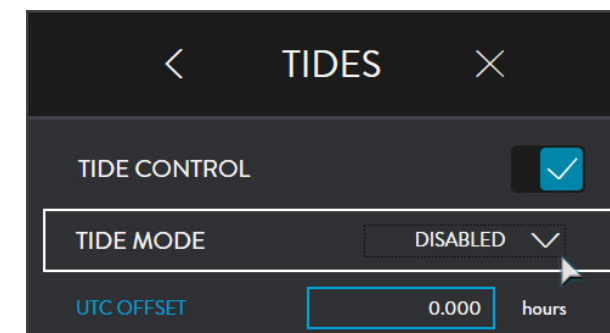


UTC OFFSET is used to correct UTC time to local time. The Offset should include any daylight savings.



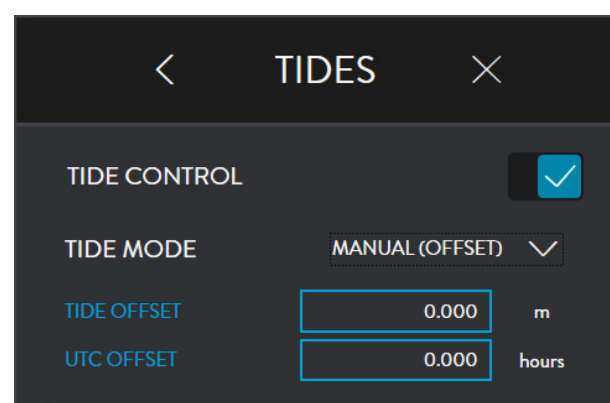
3.2.6.3. Tide Mode Disabled

No tidal offset will be applied as a correction to seafloor data in the DRX.



3.2.6.4. Tide Mode Manual (Offset)

The manually set tidal offset will be applied to the DRX.



3.2.6.5. Tide Mode RTK

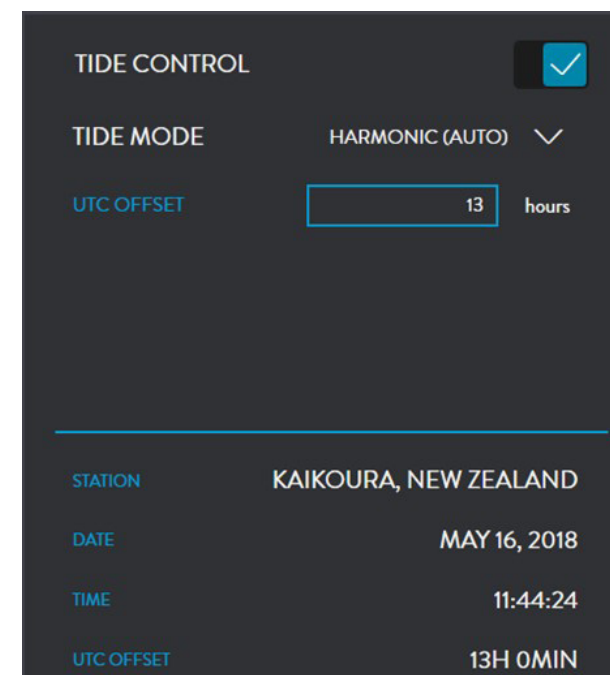
RTK tide calculates the tide based on RTK corrected GPS information. It is in general significantly more accurate than conventional tide predictions, as it is based on a real-time GPS height measurement.

It does require the RTK tide DRX license and an RTK corrected satellite compass via PPP or online RTK subscription.

3.2.6.6. Tide Mode Navionics (Auto) or Harmonic (Auto)

Tidal offset will be selected based on local tide station using time and position data. The value will be applied to the DRX periodically.

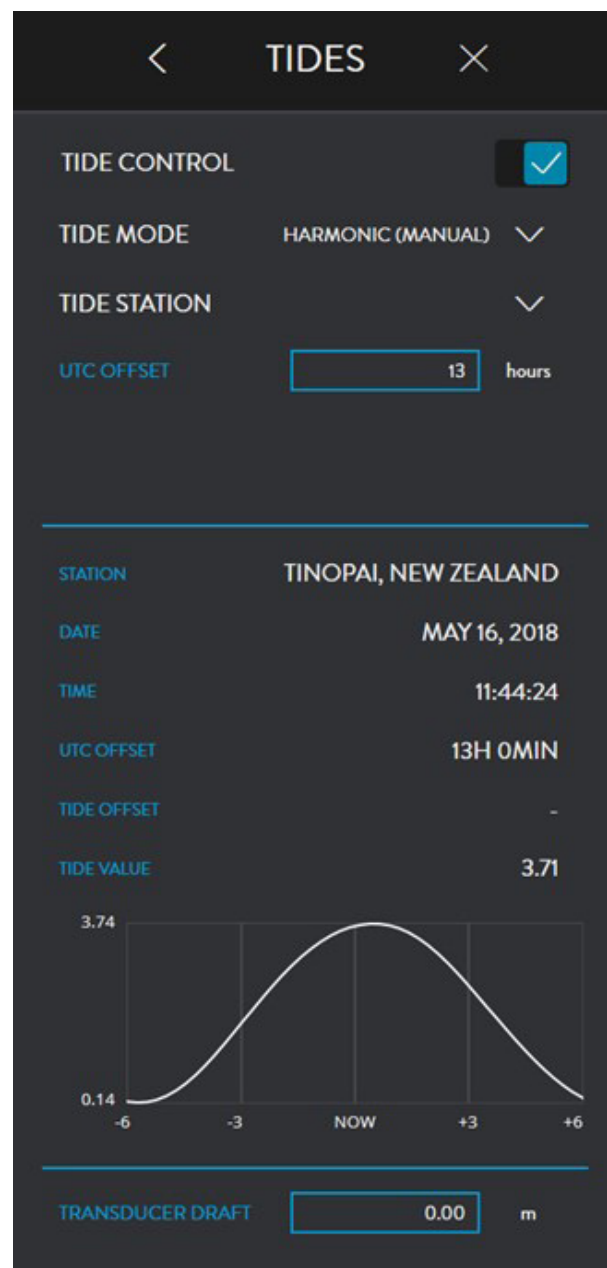
UTC OFFSET should be entered to apply correct local time for the tide station.



3.2.6.7. Tide Mode Navionics (Manual) or Harmonic (Manual)

Tidal offset will be applied based on a manually selected tide station. The value will be applied to the DRX periodically.

UTC OFFSET should be entered to apply correct local time for the tide station.



NOTE: TIDE VALUE will give the tide value currently being applied to the DRX.

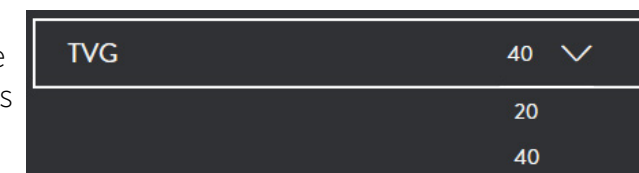


NOTE: If UTC OFFSET for local time is incorrect, this will result in incorrect tidal height being calculated.

3.2.7. TVG Options

40 (TARGET STRENGTH 40LOG) keeps the reported strength the same as single targets with the same size in all depths.

V20 (VOLUMETRIC STRENGTH 20LOG) keeps the reported strength the same as multiple targets in a beam with the same total volume in all depths.

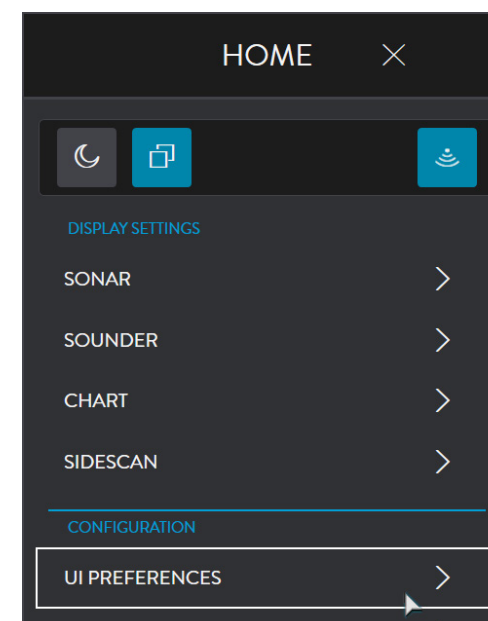


NOTE: 20 Volumetric strength is generally used to compare schools of fish in different depths (> 100m) where target strength can be used in shallow water when looking at individual fish.

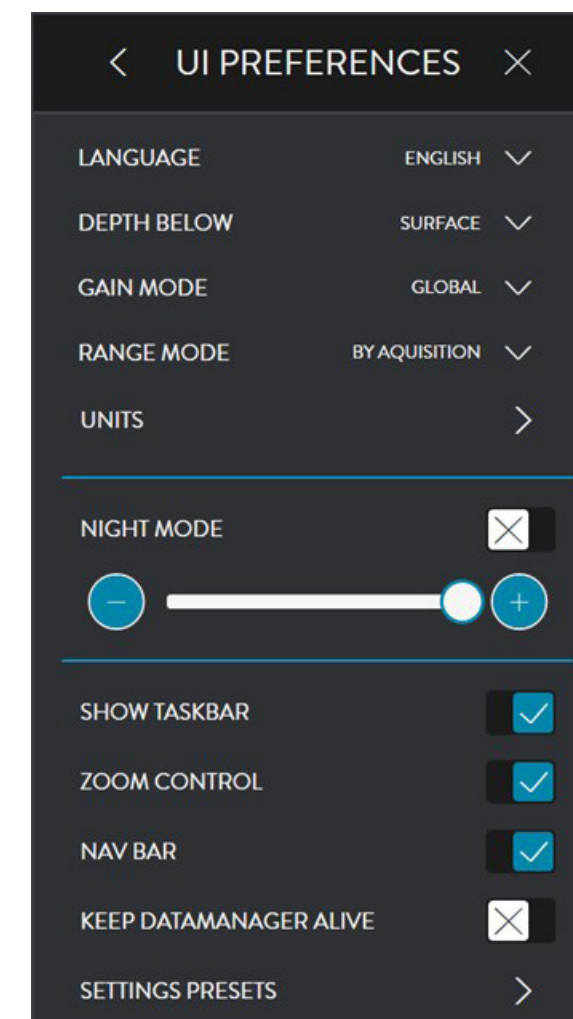
3.3. UI PREFERENCES

This provides WASSP CDX user preference options.

From the HOME bar, under CONFIGURATION select UI PREFERENCES.



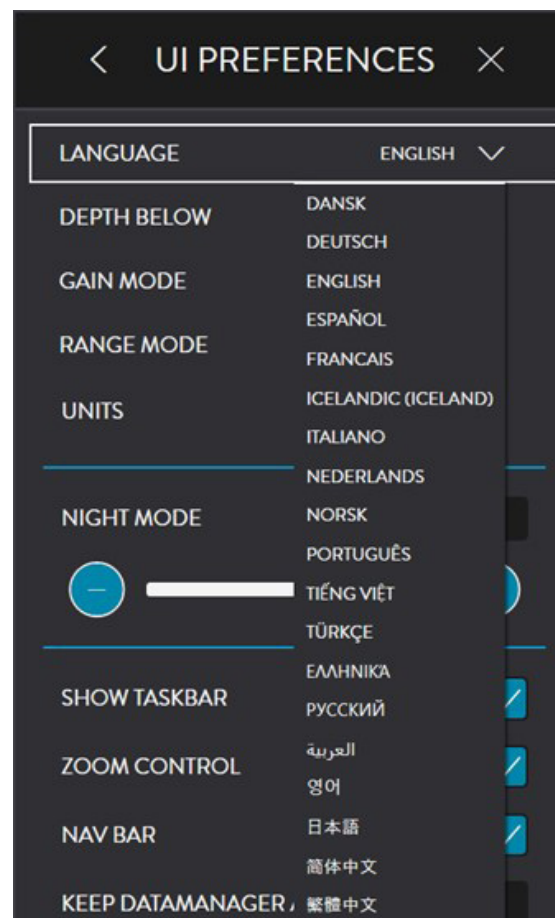
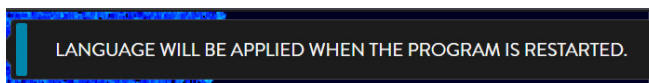
This provides the following unit preference options (opposite):



3.3.1. Language

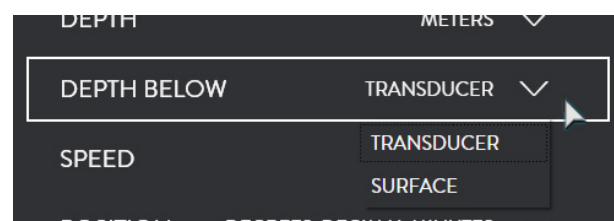
This provides language options.

Select the language you require from the drop down menu. The following notification will appear and the language will be applied when you restart CDX.



3.3.2. Depth Below

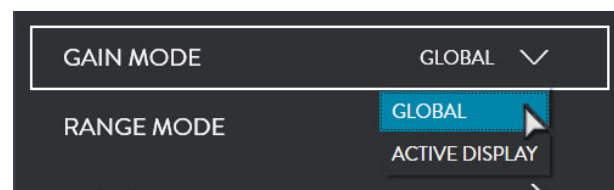
This will provide options to measure the depth below the **TRANSDUCER** or the water **SURFACE**.



3.3.3. Gain Mode

GLOBAL: The gain controls are unified across the sounder, sonar and WCTs and targets will be presented in the same colours.

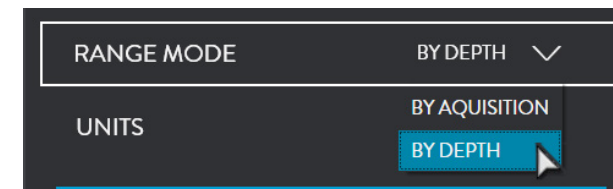
ACTIVE DISPLAY: The gain slider is independent from other screens and only applies to the selected one.



NOTE: Gain control **ACTIVE DISPLAY** also allows TimeZero users to use the WCT threshold from TimeZero instead when using that User interface in parallel with CDX.

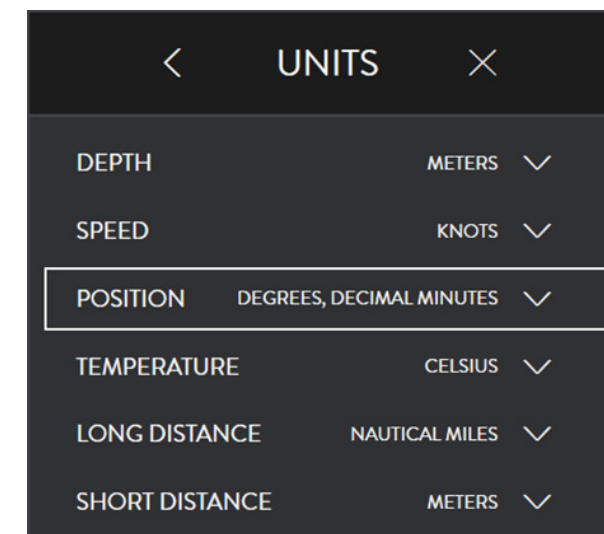
3.3.4. Range Mode

The manual range setting **BY DEPTH** allows the user to set the range to the value of the depth that the vessel is in and expect the system to track a good swath (typically > 2 times the depth).



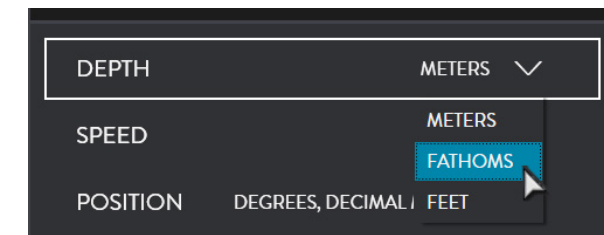
3.3.5. Units

This will provide options for depth, speed, position, temperature and distance configurations for personal preferences.



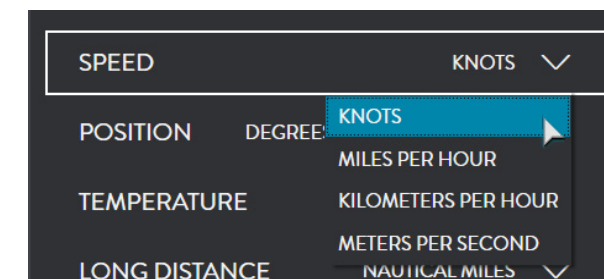
3.3.5.1. Depth

This will provide speed options in **METERS**, **FATHOMS** or **FEET**.



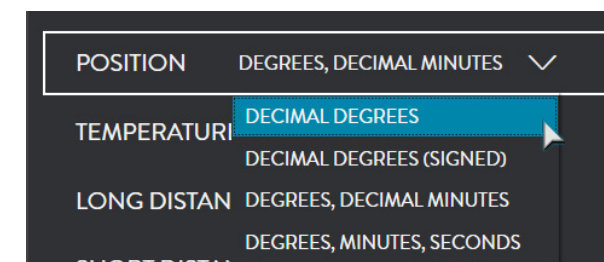
3.3.5.2. Speed

This will provide speed options in **KNOTS**, **MILES PER HOUR**, **KILOMETERS PER HOUR** or **METERS PER SECOND**.



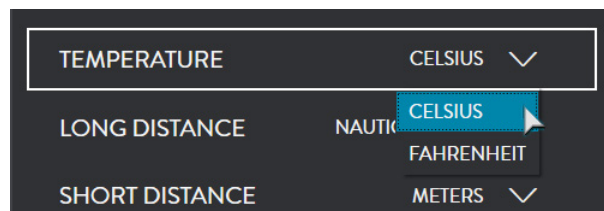
3.3.5.3. Position

This will provide position options in **DECIMAL DEGREES**; **DECIMAL DEGREES (SIGNED)**; **DEGREES, DECIMAL MINUTES** or **DEGREES, MINUTES, SECONDS**.



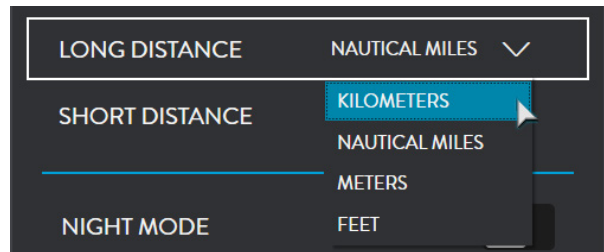
3.3.5.4. Temperature

This will provide temperature options in **CELSIUS** or **FAHRENHEIT**.



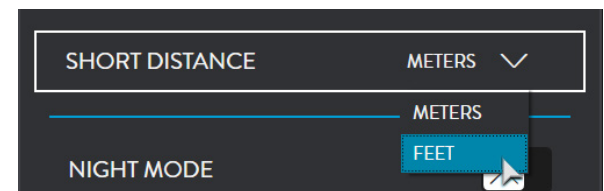
3.3.5.5. Long Distance

This will provide distant options in **NAUTICAL MILES**, **KILOMETERS**, **METERS** or **FEET**.



3.3.5.6. Short Distance

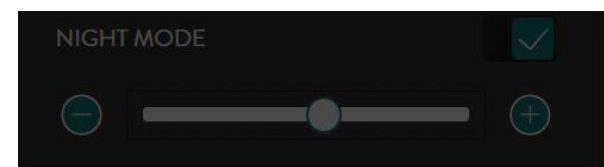
This will provide distant options in **METERS** or **FEET**.



3.3.6. Night Mode

Tick the check box to enable **NIGHT MODE**.

Use the slider control to adjust brightness level.



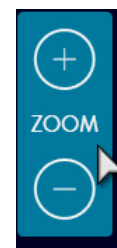
NOTE: Switching Night Mode on and off is available from the HOME MENU QUICK ACCESS BAR.

3.3.7. Show Taskbar

Tick the check box to **SHOW TASKBAR**. This will enable Windows Taskbar when CDX is running.



3.3.8. Zoom Control



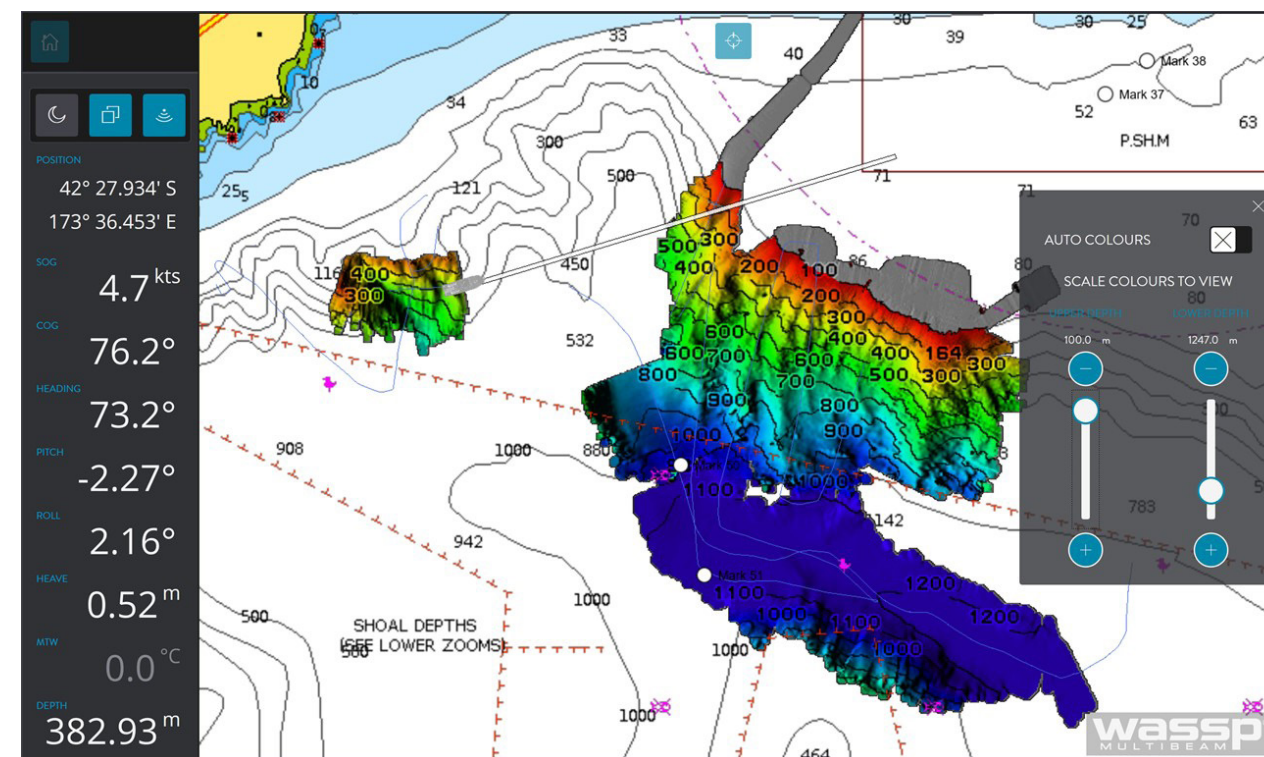
Tick the check box to enable the display **ZOOM** control. The zoom control tool will appear dimmed at the top right of the active panel. Hover over the tool to zoom in and out of the active panel.



NOTE: The active Display Panel is the panel that is currently selected. To switch active panel, click in the panel.

3.3.9. Nav Bar

The Nav Bar, when active, will appear docked to the side of the display. The Nav Bar shows general vessel information.



NOTE: Close the HOME Menu to see Nav Bar.

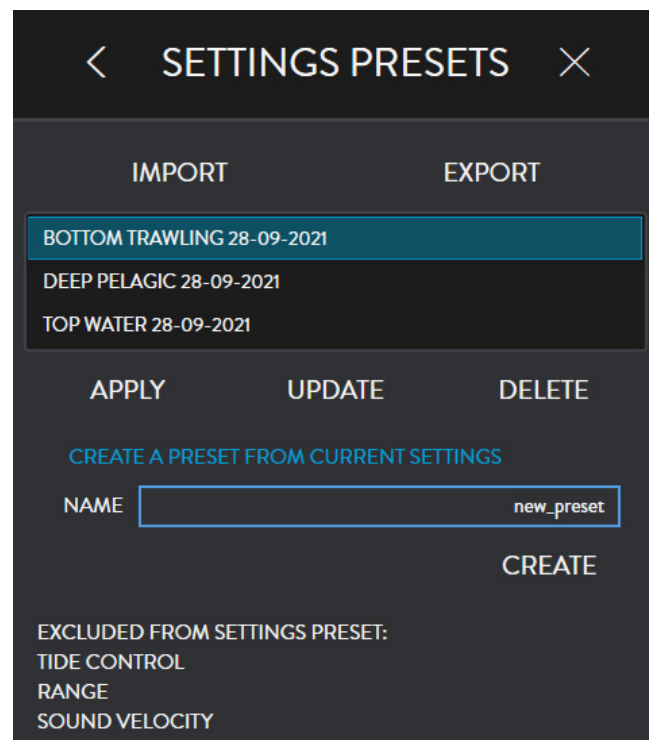
3.3.10. Keep DataManager Alive

This option would start the DataManager once CDX is started.



3.3.11. Settings Presets

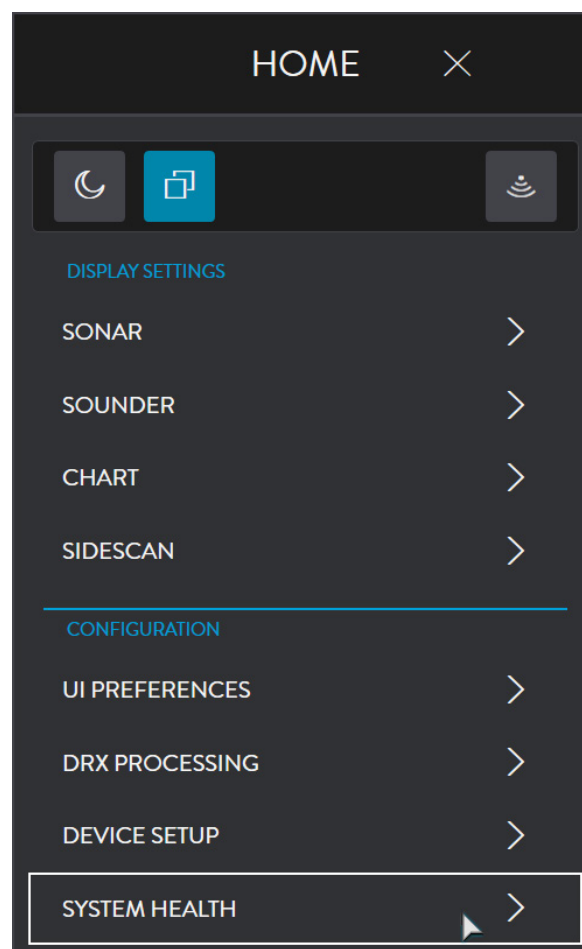
The **SETTING PRESETS** menu provides the ability to create a preset file to store the current configurations of the CDX. Additionally, the ability to apply, update or delete the preset file is available, as well as the ability to import or export existing files.



3.4. SYSTEM HEALTH

The **SYSTEM HEALTH** menu provides a customised listbox of notifications, warnings and errors.

From the **HOME** bar, under **CONFIGURATION** select **SYSTEM HEALTH**.

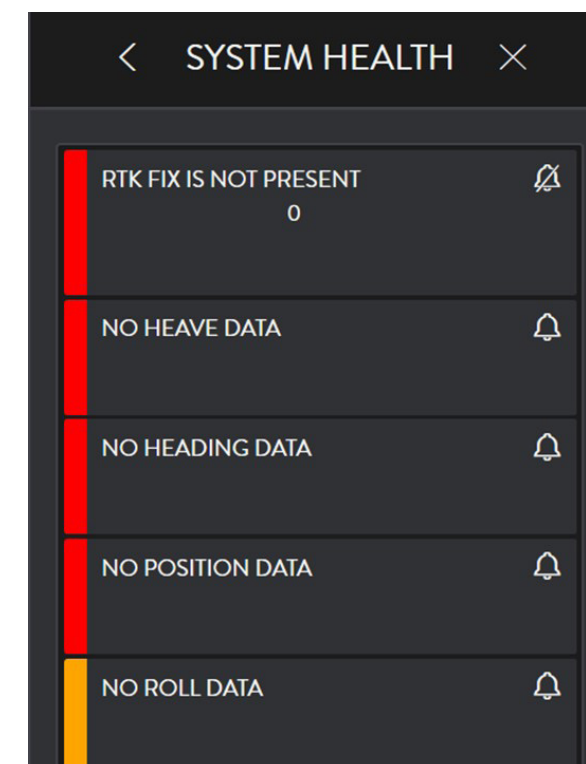


Notifications will be classified as one of three types:

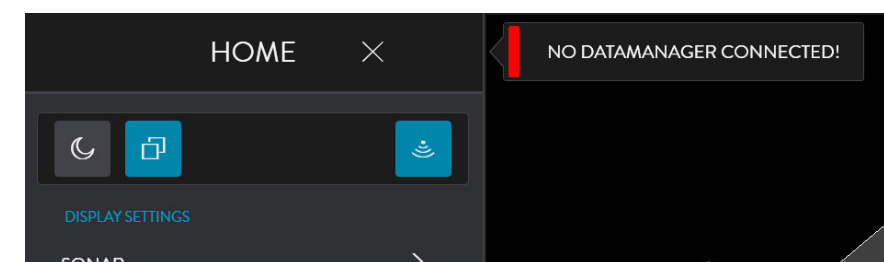
- » **INFORMATION** - these are colour coded blue. See "3.4.1. System Health Information" on page 37.
- » **WARNING** - these are colour coded orange. See "3.4.2. System Health Warning" on page 38.
- » **CRITICAL SYSTEM ERROR** - these are colour coded red. See "3.4.2. System Health Warning" on page 38.

Persistent notifications auto-clear when no longer valid. Non-persistent notifications can be cleared with an 'OK' button.

Ignore the notification by clicking the bell.



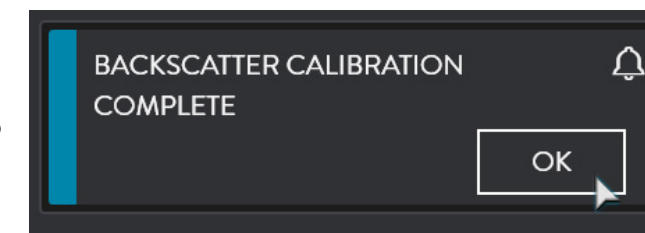
On screen alerts show a 5 second pop-up preview of any new notifications in the top left screen by the **HOME BAR** (example below).



3.4.1. System Health Information

INFORMATION - System Information and Status Updates.

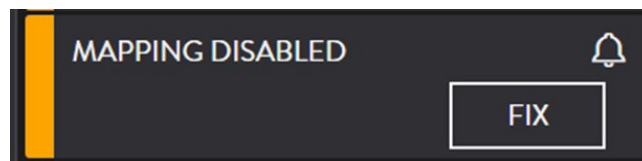
Persistent notifications auto-clear when no longer valid. Non-persistent notifications can be cleared with the **OK** button.



3.4.2. System Health Warning

WARNING – Non-critical System Errors. These affect the reliability of the system, but do not directly affect its operation.

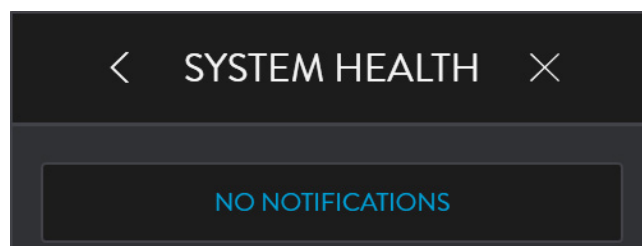
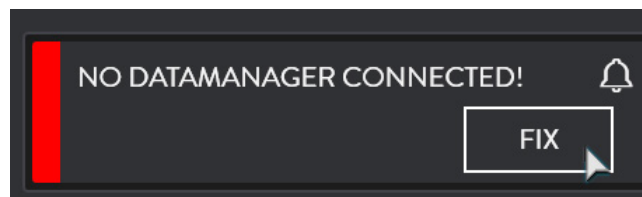
Click **FIX** to take you to the appropriate menu to find out more and/or fix the error. Once fixed, the error automatically clears in the menu.



3.4.3. System Health Error

ERROR – Critical System Errors. These directly affect system reliability and operation.

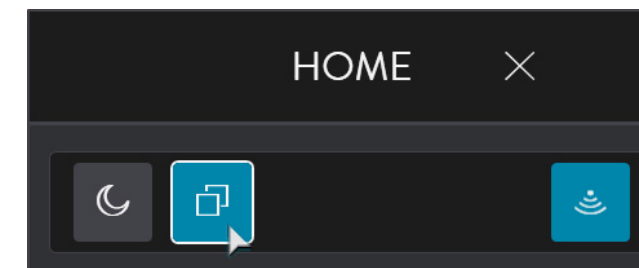
Click **FIX** to take you to the appropriate menu to find out more and/or fix the error. Once fixed, the error automatically clears in the menu.



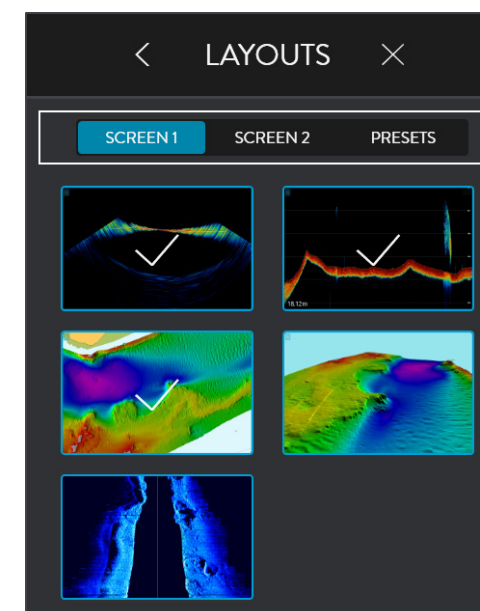
3.5. LAYOUT

Panel layout can be configured using the **LAYOUT** section of the **HOME** bar.

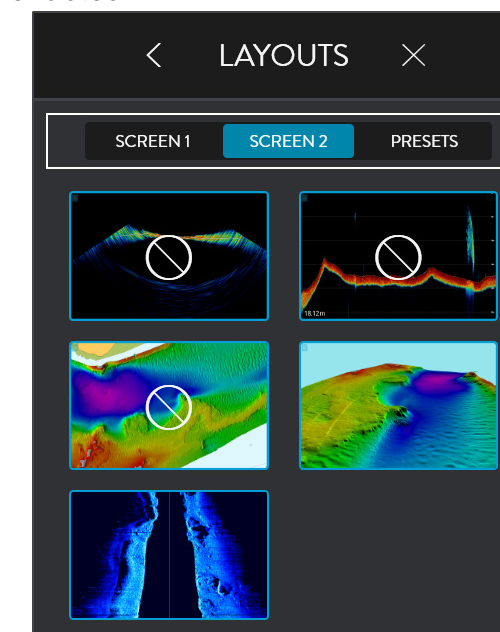
From the **HOME** bar, select **LAYOUTS**.



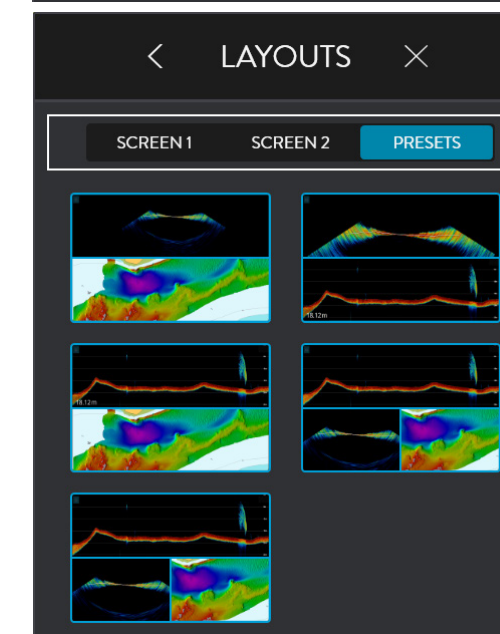
SCREEN 1 Allows layout selection options for a single display configuration. Layout selection will depend on the features enabled.



SCREEN 2 Allows layout selection options for a dual display configuration. Layout selection will depend on the features enabled.



PRESETS allows preconfigured layouts available to be selected.



4 DISPLAY PANEL SETTINGS

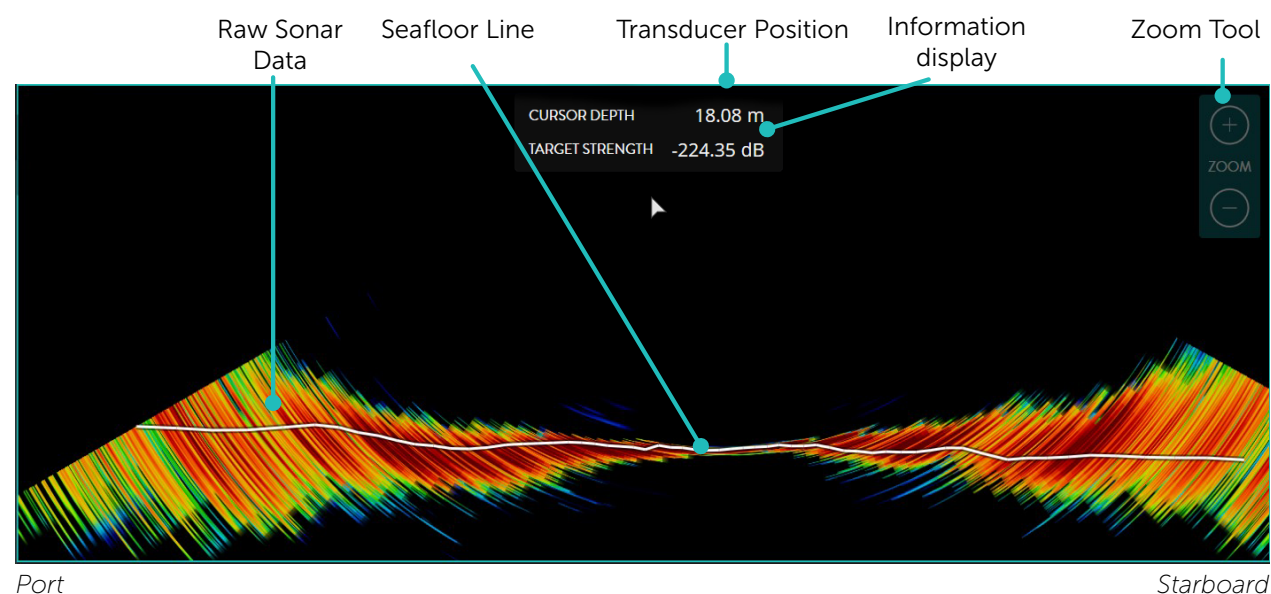
Display Panels are configured through the CSMs and/or [DISPLAY SETTINGS](#) configuration controls.

Typically the CSMs cover the most commonly accessed items but will also allow direct access to the [HOME](#) bar through the [DISPLAY SETTINGS](#) option on the CSM.

NOTE: All Display Panel configuration options are accessible through the CSM and the CSM [SETTINGS](#) option.

4.1. SONAR

The Sonar Display Panel shows the water column and seafloor profile below the transducer.



INFORMATION DISPLAY

Supplies following information at the cursor:

- » Depth.
- » Target Strength.

ZOOM & PAN CONTROL

The sonar panel can be zoomed in and out.

[AUTO ZOOM](#) allows the display to be auto zoomed to optimum depth to show the seafloor and water column. [AUTO ZOOM](#) can be enabled from the CSM. *See "4.1.1.3. Display" on page 43.*

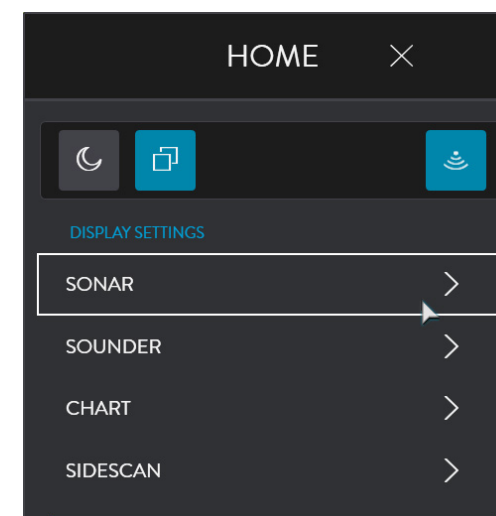
Manual zoom of displayed depth and range can be controlled using the mouse wheel or ZOOM tool. *See "3.3.8. Zoom Control" on page 35* and select the + and – controls as required.

NOTE: Touch control for ZOOM is available.

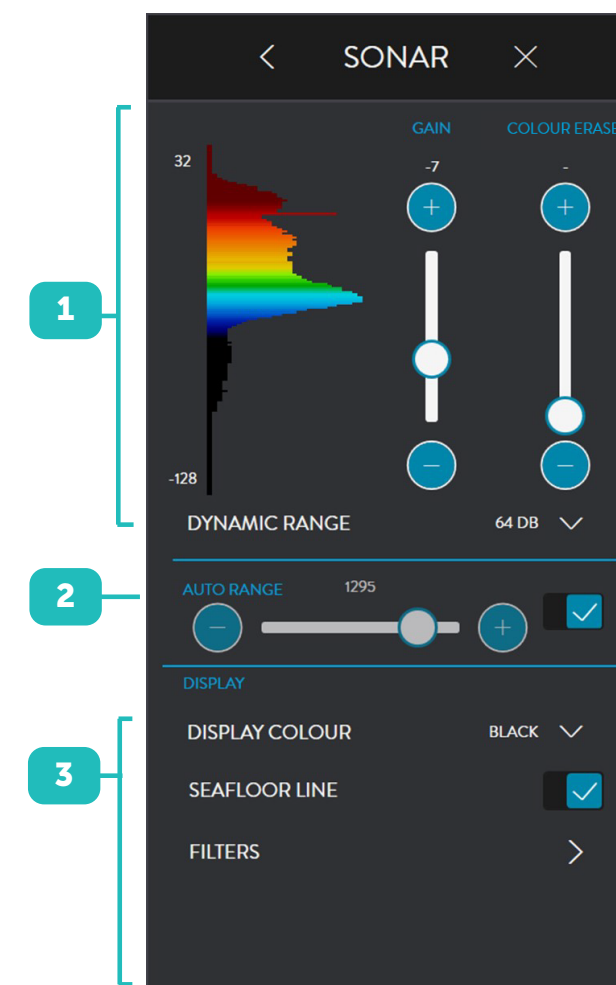
The Sonar panel can be panned in depth and Port/Starboard. To pan left-click the cursor and drag.

4.1.1. Sonar Configuration Options

From the [HOME](#) bar, under [DISPLAY SETTINGS](#) select [SONAR](#) when there is a Sonar Display Panel.



This provides the following options (opposite):



1

GAIN

[GAIN](#), [COLOUR ERASE](#), [AUTO RANGE](#) and [DISPLAY](#) are used to optimise the sonar display to the user preference. *See "4.1.1.1. Gain" on page 42.*

2

AUTO RANGE

DRX control for setting ping / transmit range for the system. *See "4.1.1.2. Auto Range" on page 43.*

3

DISPLAY

Controls for display settings. *See "4.1.1.3. Display" on page 43.*

[DISPLAY COLOUR](#) allows colour palette selection.

[SEAFLOOR LINE](#) allows seafloor line to be overlaid on the sonar data.

[FILTERS](#) allows adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality. *See "3.2.5. Filter Setup" on page 22.*

4.1.1.1. Gain

GAIN, COLOUR ERASE, DYNAMIC RANGE and DISPLAY COLOUR are used to optimise the sonar display to the user preference. This is done by selecting the dynamic range to display, the colour scale used across the displayed dynamic range, the gain level to view within the available dynamic range and the colour erase to suppress colours.

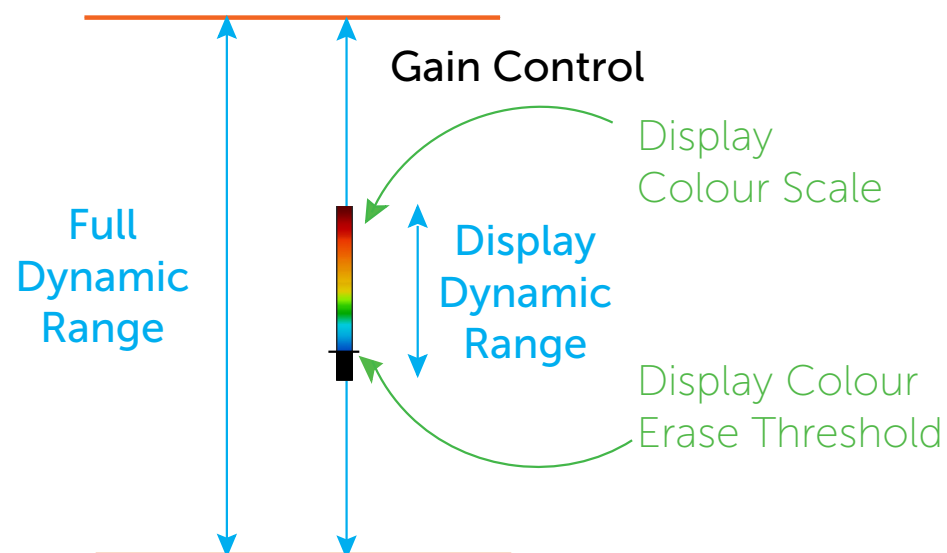


Figure 4. Sonar Gain and Dynamic Range Control & Colour Erase

Gain

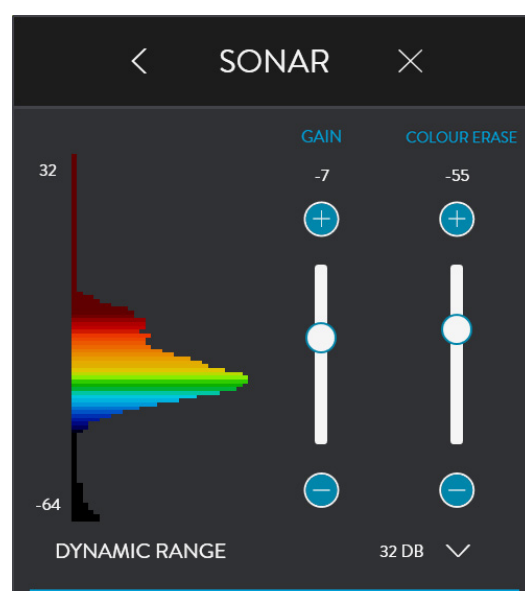
The gain level can be adjusted using the slider bar.

The histogram display alongside this slider indicates the spread of target strength returns.

Colour Erase

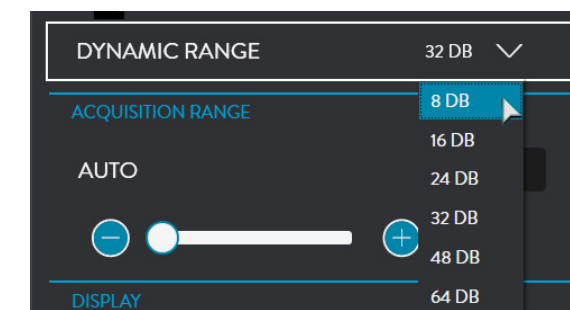
Low level noise and clutter from sediments, system noise etc can appear on the screen as dots. These can be suppressed using the Colour Erase control.

Colour Erase control will blank out any returns below the specified return strength on the slider. Suppressed returns will appear as black on the histogram and will not be displayed in the panel.



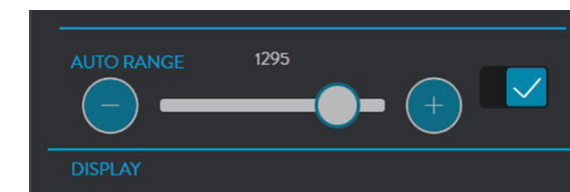
Dynamic Range

The display dynamic range can be adjusted by selecting from the available options.



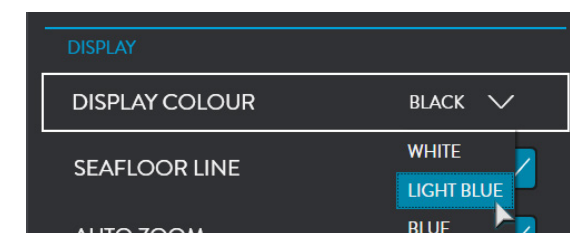
4.1.1.2. Auto Range

DRX control for setting ping / transmit range. Range can be adjusted manually using the scroll bar or automatically by selecting AUTO RANGE. AUTO RANGE will determine optimum range based on seafloor depth.



4.1.1.3. Display

DISPLAY COLOUR will provide the option to use various colour scales for the display.



SEAFLOOR LINE displays the seafloor line when enabled.



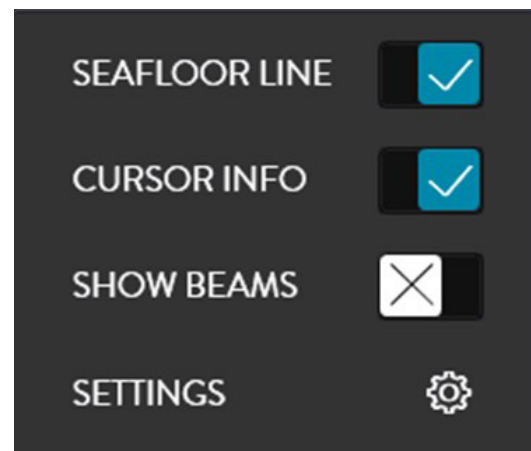
FILTERS allows adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality.

See "3.2.5. Filter Setup" on page 22.



4.1.2. Sonar CSM

Accessed by right-clicking in the Sonar Display Panel.



SEAFLOOR LINE

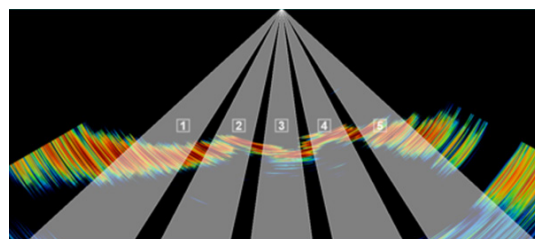
Allows seafloor line to be overlaid on the sonar data.

CURSOR INFO

Displays the Information display as an overlay on the Display Panel.

SHOW BEAMS

Shows the Sounder beams overlaid on the Sonar panel. *See "4.2.1.3. Beam Setup" on page 49.*



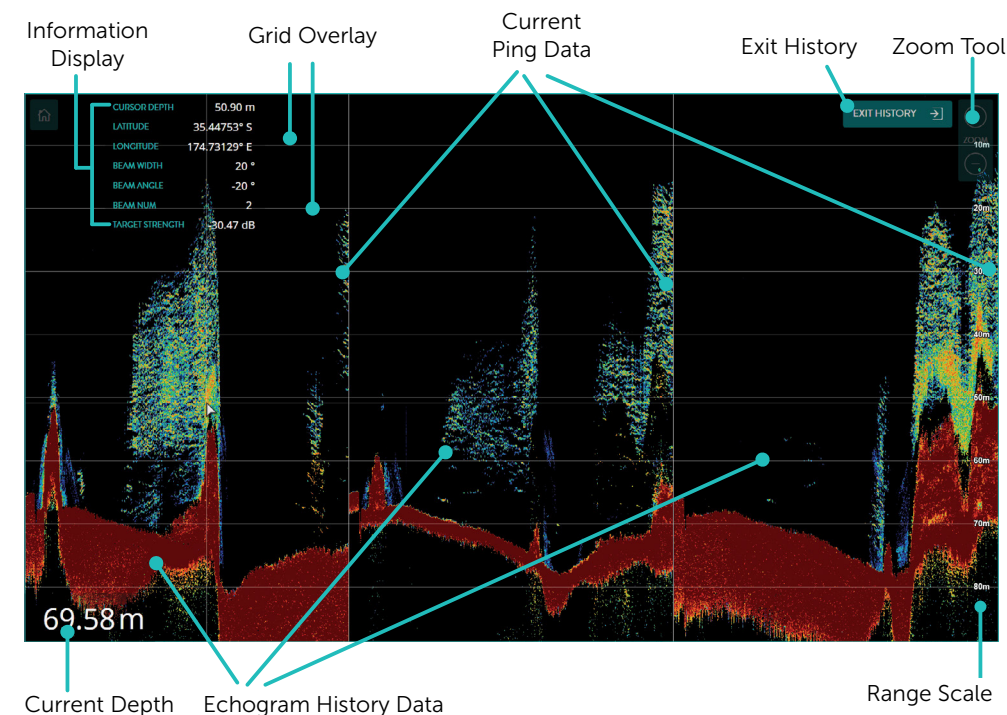
SETTINGS

This option will display the **SONAR** Menu. *See "4.1. Sonar" on page 40.*

4.2. SOUNDER

The Sounder Display Panel shows the traditional sounder echogram display for each of the active beams selected.

The display may show single beam, triple beam or quint beam modes in the Display Panel. Below shows the typical triple beam display.



INFORMATION DISPLAY

Supplies following information at the cursor:

- » Position and depth.
- » Beam details.
- » Target Strength.

ZOOM & PAN CONTROL

The sounder panel can be zoomed in and out.

AUTO ZOOM allows the display to be auto zoomed to optimum depth to show the seafloor and water column.

Manual zoom of displayed depth and range can be controlled using the mouse wheel or **ZOOM** tool. *See "3.3.8. Zoom Control" on page 35* and select the + and – controls as required.



NOTE: Touch control for zoom is available.

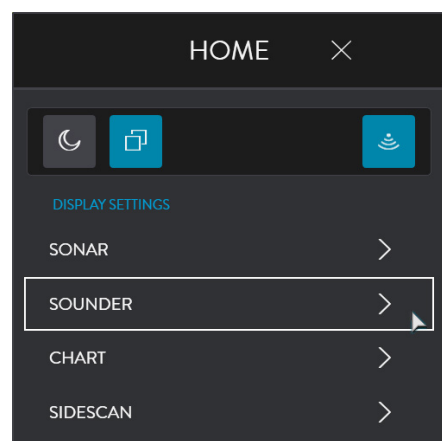
The Sounder panel can be panned to view history:

- » Left-click cursor and drag to see history in pan mode.
- » On pan the **EXIT HISTORY** control will appear.
- » To exit pan mode click on **EXIT HISTORY**.

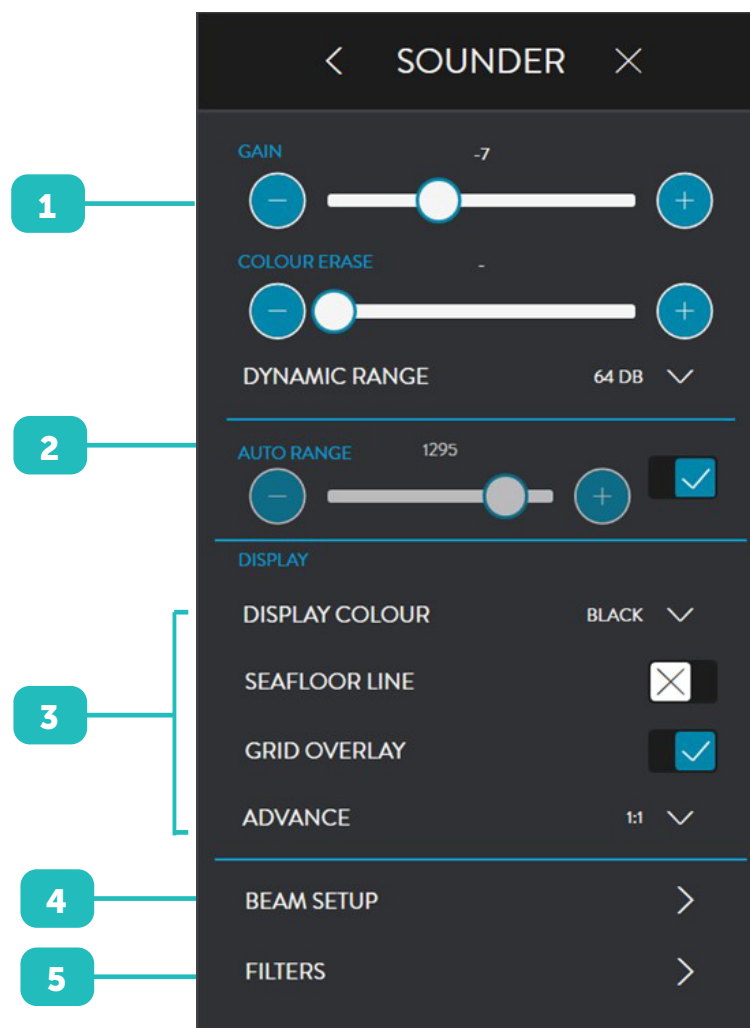
The Sounder panel can be panned in depth. To pan in depth, left-click cursor and drag.

4.2.1. Sounder Configuration Options

From the HOME bar, select SOUNDER when there is a Sounder Display Panel.



This provides the following options (shown opposite):



- 1 GAIN** GAIN and DYNAMIC RANGE and DISPLAY COLOUR are used to optimise the Sounder display to the user preference. See "4.2.1.1. Gain" on page 47.
- 2 AUTO RANGE** DRX control for setting ping / transmit range for the system. See "4.1.1.2. Auto Range" on page 43.
- 3 DISPLAY** Controls for display settings. See "4.2.1.2. Display" on page 48.
 DISPLAY COLOUR allows colour palette selection.
 SEAFLOOR LINE allows seafloor line to be overlaid on the sonar data.
 GRID OVERLAY overlays a grid on the Echogram display.
 ADVANCE option allows for advancing the Echogram scroll at the required rate.

- 4 BEAM SETUP** Allows independent configuration of each sounder beam. See "4.2.1.3. Beam Setup" on page 49.
- 5 FILTERS** Allows adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality. See "3.2.5. Filter Setup" on page 22.

4.2.1.1. Gain

GAIN, COLOUR ERASE, DYNAMIC RANGE and DISPLAY COLOUR are used to optimise the sounder display to the user preference. This is done by selecting the dynamic range to display, the colour scale used across the displayed dynamic range, the gain level to view within the available dynamic range and the colour erase to suppress colours.

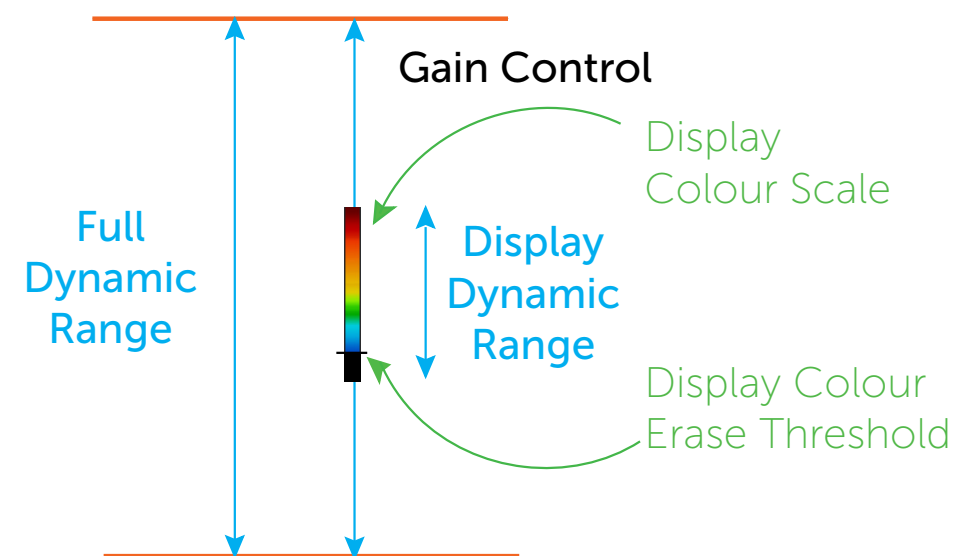


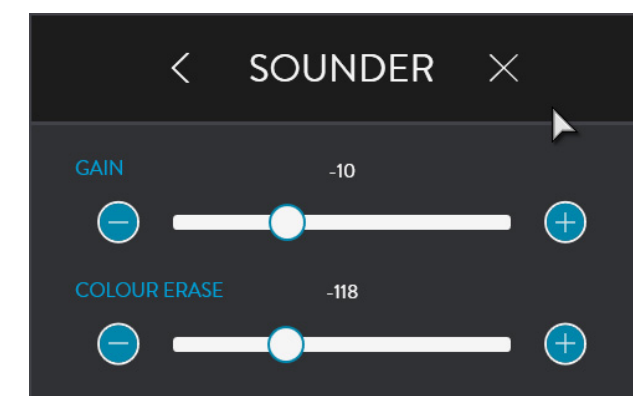
Figure 5. Sounder Gain and Dynamic Range Control & Colour Erase

Gain

The gain level can be adjusted using the slider bar.

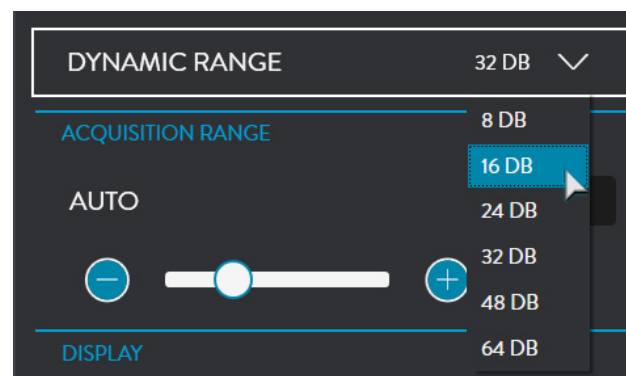
Colour Erase

Colour Erase control will blank out any returns below the specified return strength on the slider. Suppressed returns will not be displayed in the panel.



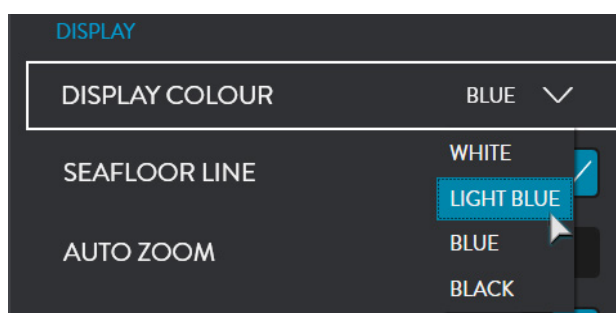
Dynamic Range

The display dynamic range can be adjusted by selecting from the available options.



4.2.1.2. Display

DISPLAY COLOUR will provide the option to use various colour scales for the display.



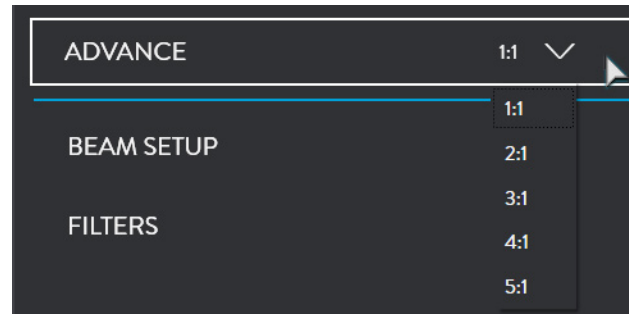
SEAFLOOR LINE displays the seafloor line when enabled.



GRID OVERLAY overlays a grid on the Echogram display.



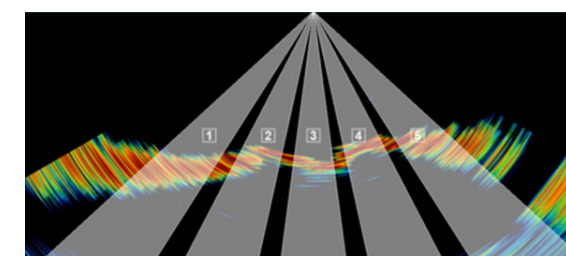
ADVANCE option allows for advancing the Echogram scroll at the required rate.



4.2.1.3. Beam Setup

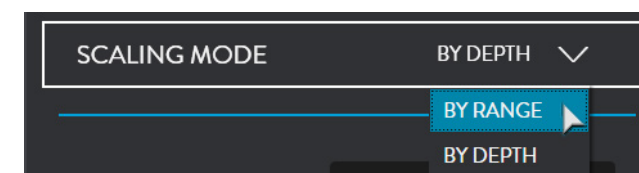
BEAM SETUP allows independent configuration of each sounder beam.

The sounder beams are equivalent to a set of independent single beam sounders which can be used at any angle across the multibeam swath. This can be depicted on the sonar view.



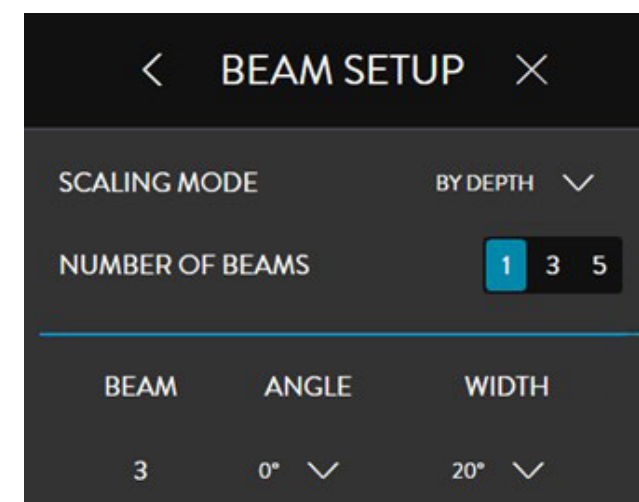
SCALING MODE - the sounder beams' scale can either be set to range scale or depth scale.

If depth scale is selected the data will be adjusted to compensate for the beam angle to represent depth below transducer.

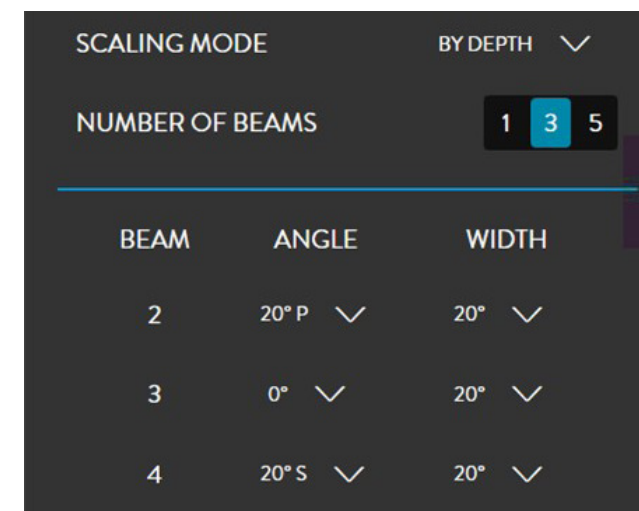


NUMBER OF BEAMS is used to display 1, 3 or 5 beams in the Sounder Display Panel.

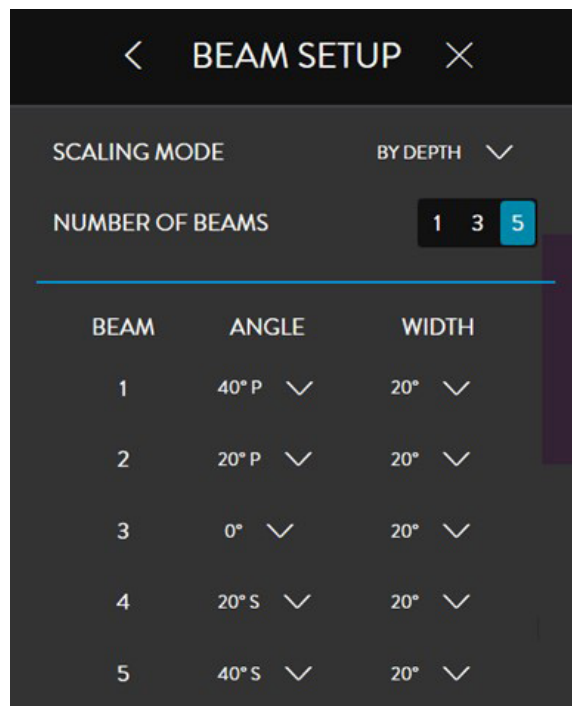
» 1 will just display beam B3 (Beam 3 is typically the Nadir beam).



» 3 will display beams B2, B3 and B4.



» 5 will display beams B1, B2, B3, B4 and B5.

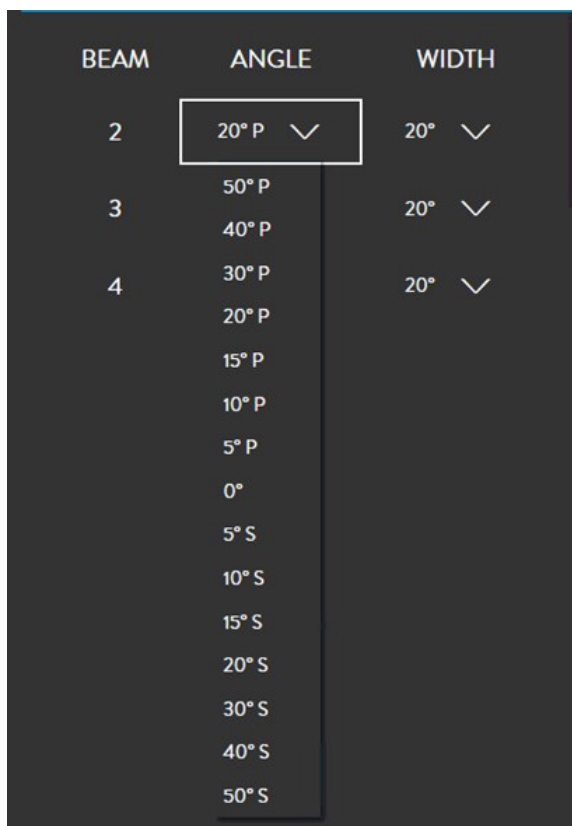


Individual beam configuration is carried out through the beam selection. Each beam can be configured independently if default operations need to be changed.

1. For the selected beam set the angle off of Nadir from the ANGLE options.



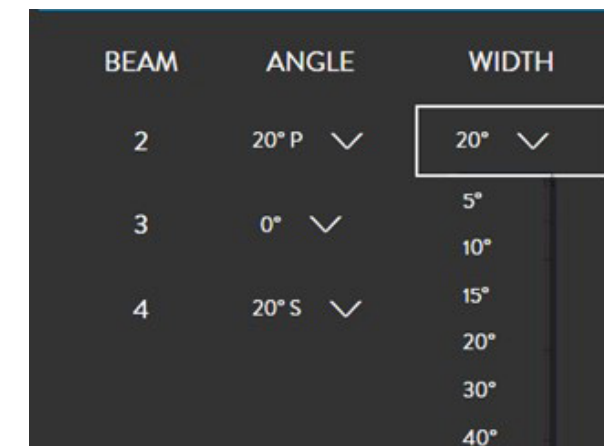
NOTE: 0° is Nadir, P is angle Port side of Nadir, S is Starboard side of Nadir.



2. For the selected beam set the width from the WIDTH options.

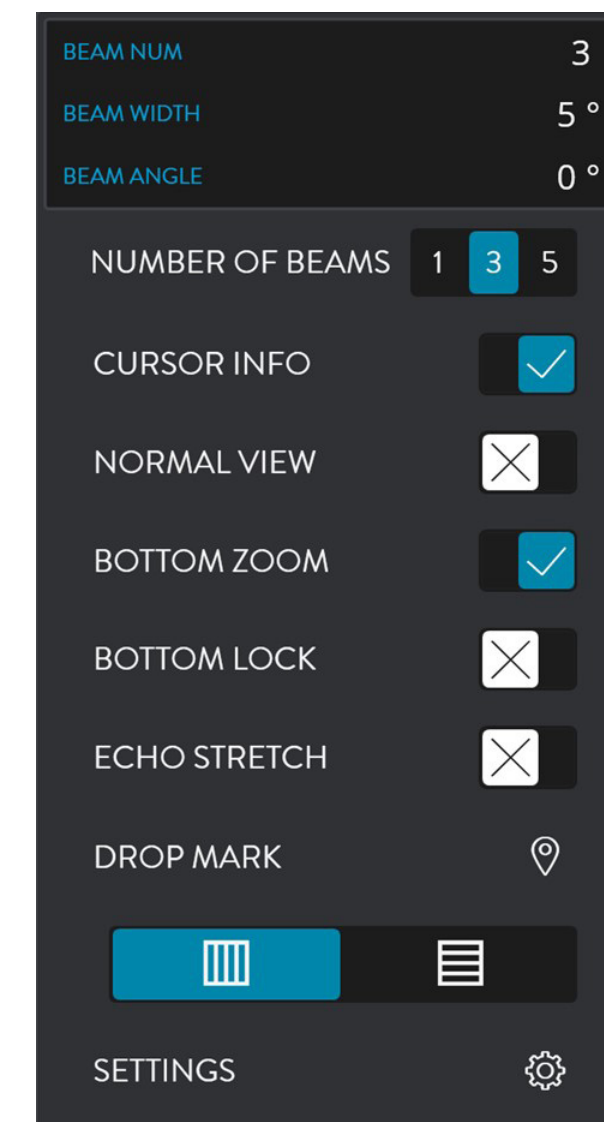


NOTE: BEAM WIDTH and BEAM ANGLE off Nadir will determine seafloor coverage of the beam.



4.2.2. Sounder CSM

Accessed by right-clicking in the Sounder Display Panel.



NUMBER OF BEAMS

NUMBER OF BEAMS is used to display 1, 3 or 5 beams in the Sounder Display Panel. See "4.2.1.3. Beam Setup" on page 49.

CURSOR INFO

Displays the Information display as an overlay on the Display Panel.

NORMAL VIEW

NORMAL VIEW is the traditional sounder presentation.

BOTTOM ZOOM

BOTTOM ZOOM zooms the display around the bottom and the view stays there even when the depth changes. **BOTTOM ZOOM** can be used when the primary interest is in and just above the bottom while maintaining the contour of the bottom.

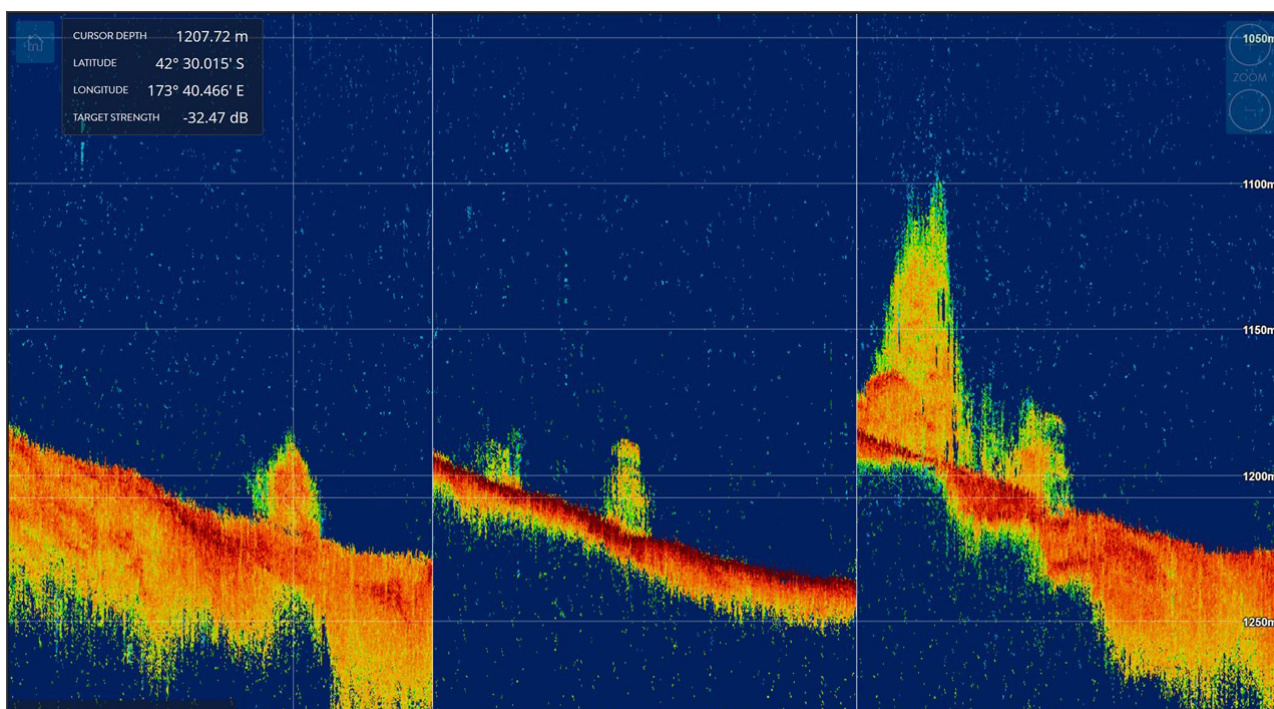
BOTTOM LOCK

BOTTOM LOCK mode displays the bottom as a straight line, no matter how the bottom contour may change.

Fish and other water column targets are relative to this flat bottom line.

There are 3 options to view:

- » **NORMAL VIEW** enabled and **BOTTOM LOCK** disabled will show the **NORMAL VIEW**.
- » **BOTTOM LOCK** enabled and **NORMAL VIEW** disabled will show the **BOTTOM LOCK**.
- » **BOTTOM LOCK** and **NORMAL VIEW** enabled will show both views (as below).



ECHO STRETCH

Enlarges sounder marks.

DROPMARK

Places a mark at the cursor position. To modify or delete this mark, right-click on the symbol and a sub menu will appear.

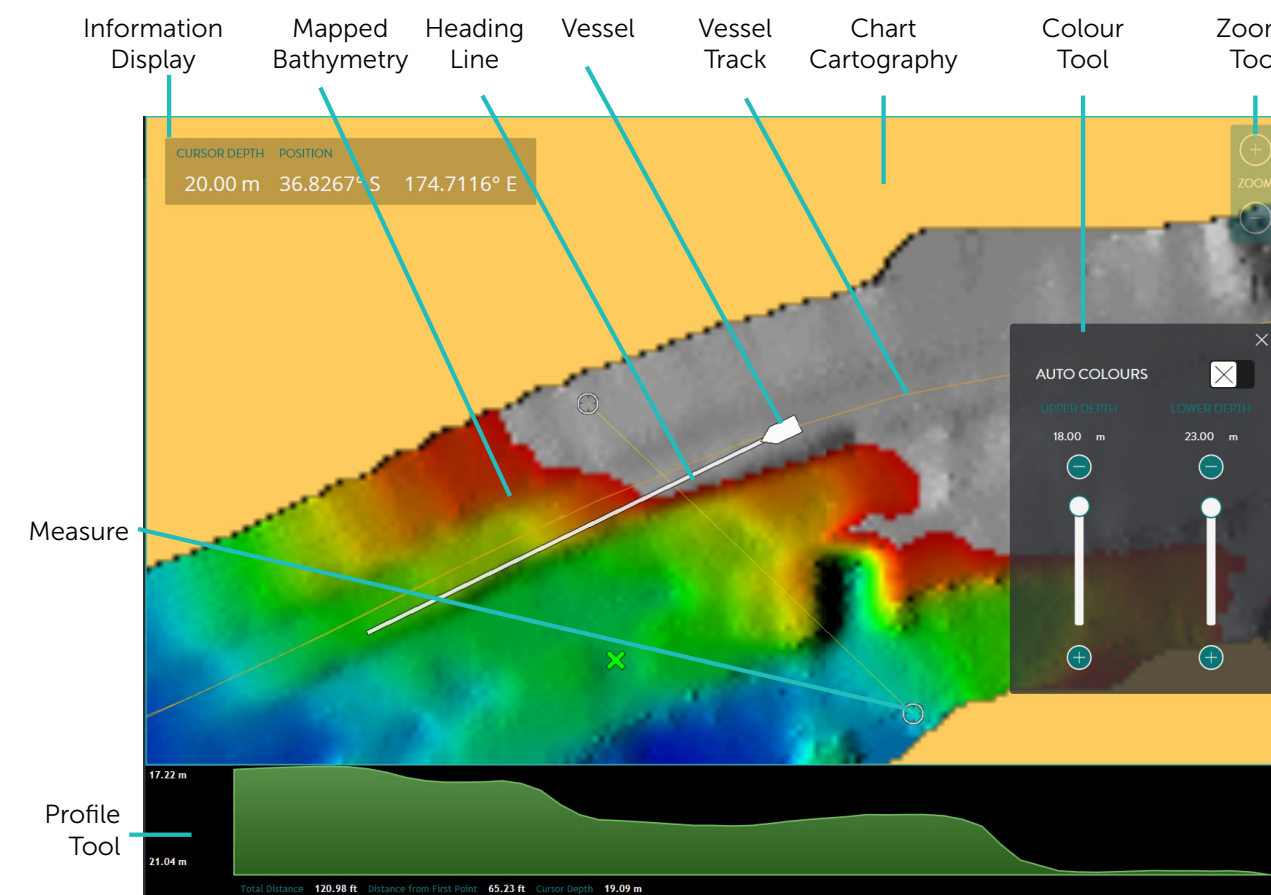
Click on Edit to modify the name or colour. *See "5.1. Marks" on page 72.*

SETTINGS

This option will display the **SOUNDER** Menu. *See "4.2. Sounder" on page 45.*

4.3. CHART

The Chart display overlays Bathymetry data and optionally backscatter data, Real Time on chart cartography layers.



INFORMATION DISPLAY

Supplies following information at the cursor:

- » Depth.
- » Position.

ZOOM & PAN CONTROL

The Chart panel can be ranged in and out.

Manual zoom of range can be controlled using the mouse wheel or ZOOM tool, *see "3.3.8. Zoom Control" on page 35.* Select the + and - controls as required.



NOTE: Touch control for ZOOM is available.

The 2D Chart panel can be panned to display different geographical areas. To pan the chart, left-click cursor and drag.



NOTE: To re-center on the vessel use the CSM.

The 3D Chart panel can be orientated; left-click the cursor and drag.

4.3.1. Charting Cartography

Charting cartography supported currently includes:

- » Navionics Gold/Navionics+
- » Navionics Platinum

Navionics charting on SD card will be automatically detected and loaded into [WASSP CDX](#).

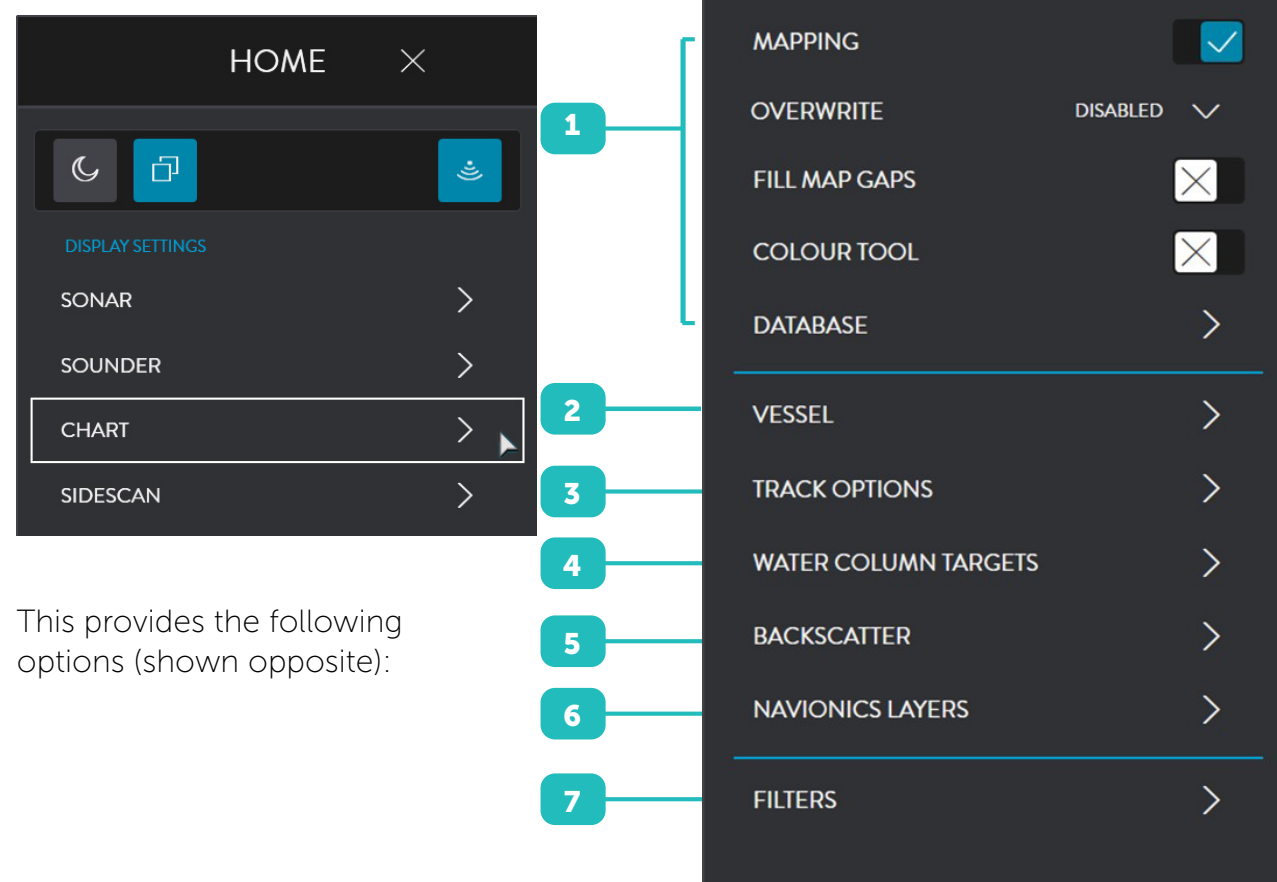
Multiple carts can be loaded by taking out the previous Navionics SD card, inserting another Navionics SD chart for a different region and restarting [WASSP CDX](#). Both charts will now be loaded in [WASSP CDX](#).



NOTE: Navionics charting needs to be registered over the internet on first use. Registration will be automatically carried out by WASSP CDX and will require an internet connection. Once registered no internet connection is required.

Chart Configuration Options

From the [HOME](#) bar, select [CHART](#) when there is a 2D or 3D Display Panel.



This provides the following options (shown opposite):

1

CHART

Controls for mapping options

- » **MAPPING:** To enable or disable Bathymetry being saved to the database and displayed on the chart
- » **OVERWRITE:** Enables options for bathymetry overwrite based on time delay. *See "4.3.1.1. Overwrite" on page 56.*
- » **FILL MAP GAPS:** Fills gaps in bathymetry between detection points. *See "4.3.1.2. Fill Map Gaps" on page 56.*
- » **COLOUR TOOL:** Used to select Bathymetry colour display. *See "4.3.1.3. Colour Tool" on page 56.*
- » **DATABASE:** Used to set up the Mapping Database. *See "4.3.4. Database" on page 67.*

2

VESSEL

- » Provides the ability to customise the icon of the displayed boat on the chart as well as setting its length. *See "4.3.1.4. Vessel" on page 57.*

3

TRACK OPTIONS

Used to set up vessel track on the 2D Chart. *See "4.3.1.5. Track Options" on page 57.*

4

WATER COLUMN TARGETS

Used to access the Water Column Targets setup and configuration options for overlay on the chart. *See "4.3.1.6. Water Column Targets" on page 58.*

5

BACKSCATTER

Used to access the Backscatter setup and configuration options for overlay on the chart. *See "4.3.1.7. Backscatter" on page 60.*

6

NAVIONICS LAYERS

Used to access the Water Column Targets setup and configuration options for overlay on the chart. *See "4.3.1.6. Water Column Targets" on page 58.*

7

FILTERS

Allows adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality. *See "3.2.5. Filter Setup" on page 22.*



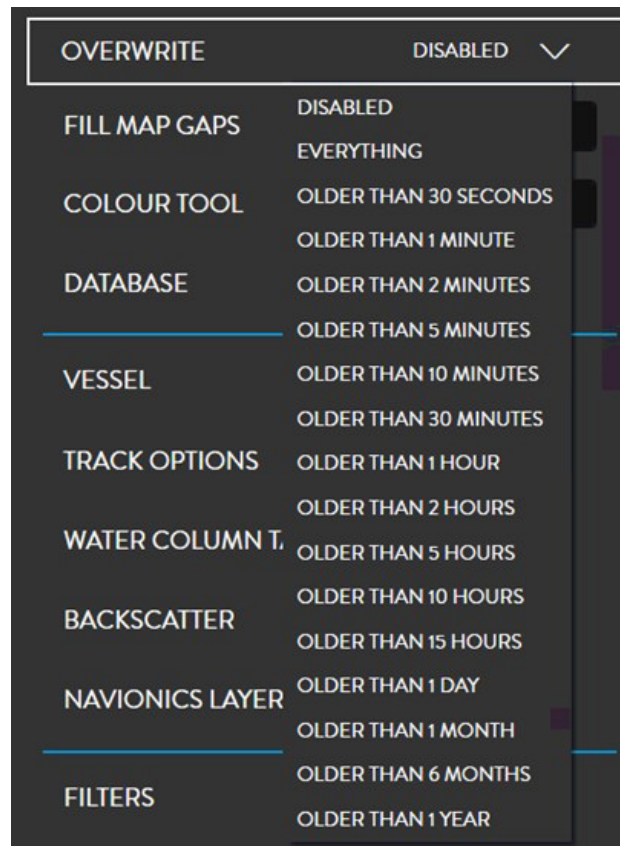
NOTE: Options that are disabled are only available with appropriate feature licensing.

4.3.1.1. Overwrite

Wassp CDX merges data together using old and new data to create the most accurate reading.

With **OVERWRITE** enabled, old data will be overwritten. The default is **DISABLED**.

The drop-down menu provides options of the time delay before bathymetry overwrite is enable. For instance; If '1 Minute' is selected any bathymetry older than 1 minute will be overwritten as new bathymetry data is created.



4.3.1.2. Fill Map Gaps

FILL MAP GAPS will interpolate between bathymetry data where there are areas of missing bathymetry.

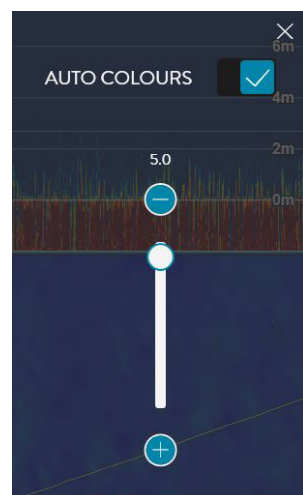


4.3.1.3. Colour Tool

The **COLOUR TOOL** allows colour range to be set on the Bathymetry.

With **AUTO COLOURS** enabled the colour range will be assigned automatically, centered around the current depth at the vessel.

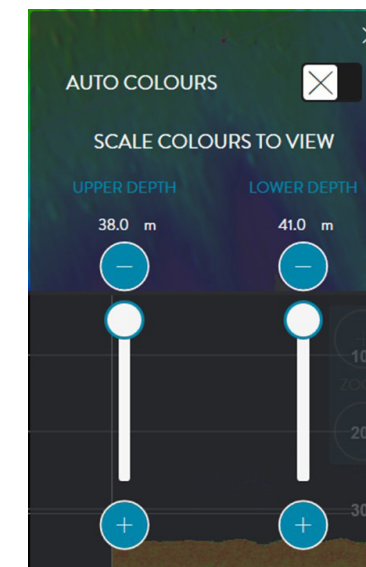
The colour range around depth at vessel can be adjusted using the slider. This will other condense or extend the colour range for a specific depth range.



With **AUTO COLOURS** disabled the colour range will be controlled by the user.

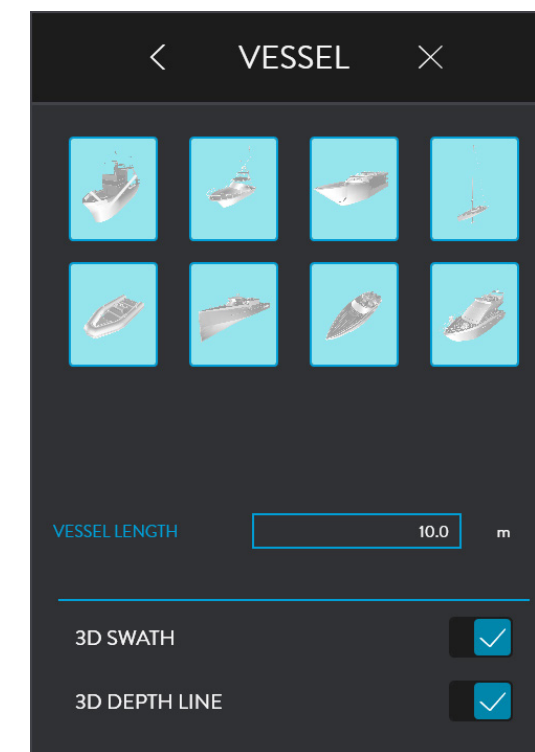
The colour range can be condensed or extended using the slider bars to apply between two user specified depths.

SCALE COLOURS TO VIEW adjusts the colours of viewed area automatically.



4.3.1.4. Vessel

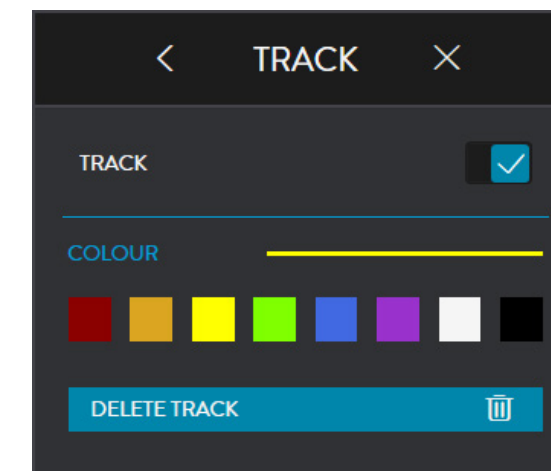
This menu provides the ability to customise the icon of the displayed boat on the chart as well as setting its length.



4.3.1.5. Track Options

By selecting **TRACK OPTIONS**, the following options are available:

- » **TRACK** enables or disables display of the track on the 2D Chart display.
- » **COLOUR** allows track colour selection.
- » **DELETE TRACK** will permanently delete the track.

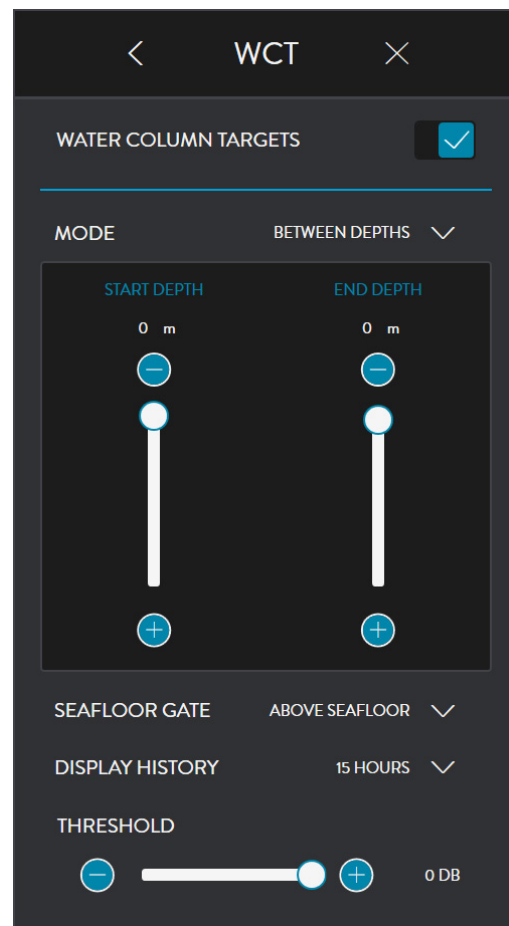


4.3.1.6. Water Column Targets

When enabled, target detections in the water column will be displayed on the 2D and 3D Chart panels.

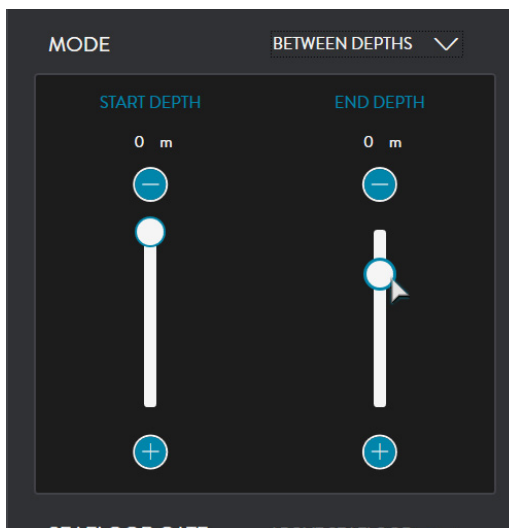
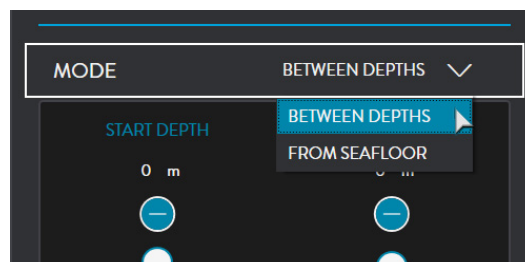
The water column detections are coloured and sized depending on the intensity of the return signal. Typical water column targets that will be depicted and overlaid on the chart display are individual fish targets and fish schools. However, they will also include artefacts and, depending on the threshold level set, may also include sediment and turbulence.

The water column targets are stored and can be retrieved for viewing historical data.

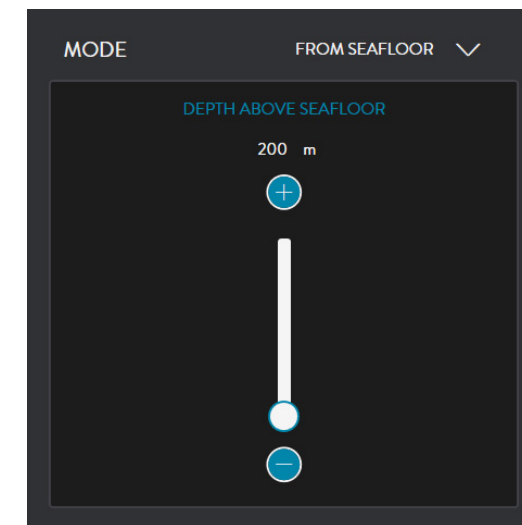


MODE toggles between **BETWEEN DEPTHS** and **FROM SEAFLOOR**. The area of interest can either be defined in the water column below the surface, **BETWEEN DEPTHS**, or as a zone above the seafloor, **FROM SEAFLOOR**.

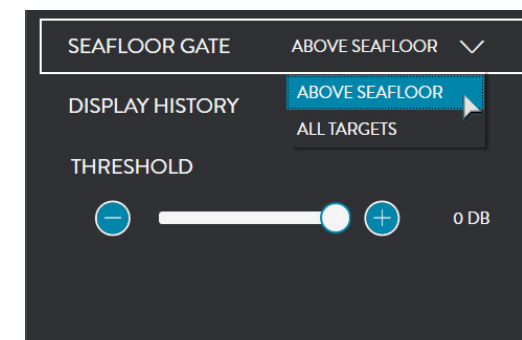
When **BETWEEN DEPTHS** is selected, define the **START DEPTH** and **END DEPTH** by dragging the indicators on the slider controls. Detections outside the selected zone will be ignored.



When **FROM SEAFLOOR** is selected, define **DEPTH ABOVE SEA LEVEL** by dragging the indicator on the slider control. Detections above the selected distance above the seafloor will be ignored.

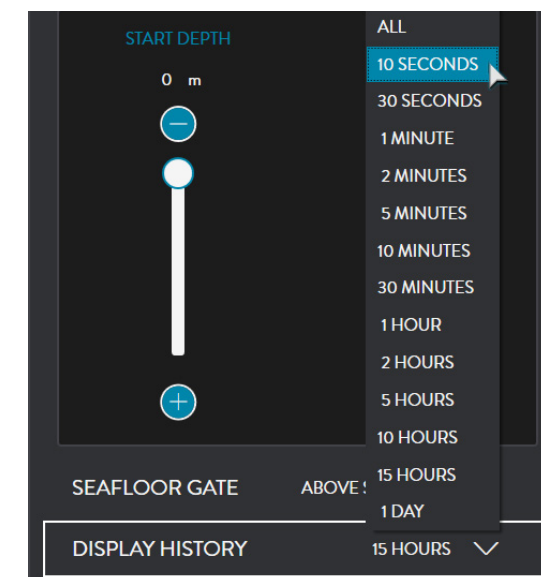


SEAFLOOR GATE toggles between **ABOVE SEAFLOOR** and **ALL TARGETS**. The area of interest can be limited to being above the seafloor or using **ALL TARGETS** for the full ping / transmit range. This is specifically useful when working in water where seafloor depth is beyond the ping / transmit range.



DISPLAY HISTORY can be selected to a specified time or to **ALL**.

The specified time will determine how much historical water column detections data will be displayed on the Chart panels.



THRESHOLD slider control allows selection of the target strength level above which the return signal will be deemed as a water column target and displayed as such.



NOTE: Water column targets will only be available for display on the Chart panels if they are within the selected zone and above the selected threshold level at the time of acquisition.

4.3.1.7. Backscatter

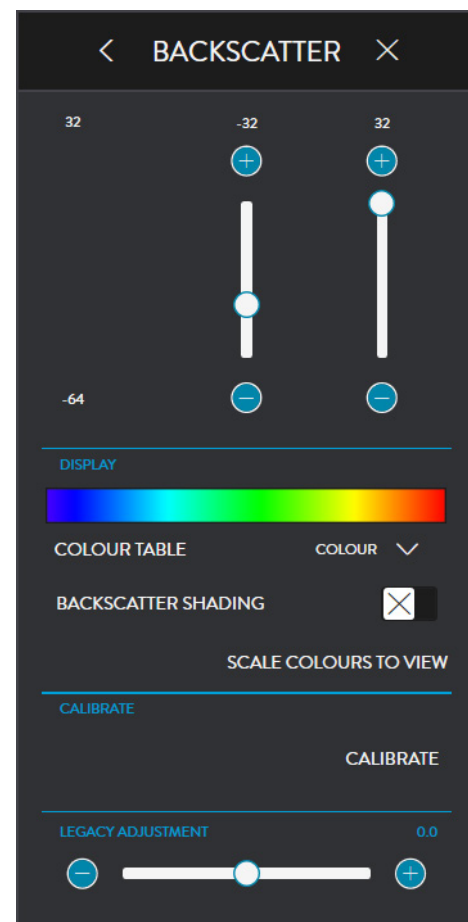
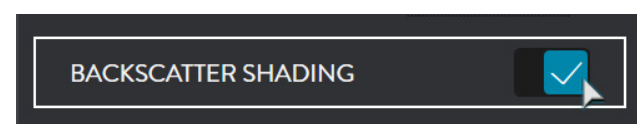
Backscatter overlay displays seafloor surface reflectivity as the seafloor target strength compensated for reflection angle due to slope, beam angle, and other losses.

The backscatter calibration routine needs to be run in order to compensate for system characteristics.

BACKSCATTER SHADING shows the backscatter overlay on the chart.

Backscatter will show instead of Bathymetry when enabled.

Backscatter overlay displays seafloor reflectivity, represented by colour change.

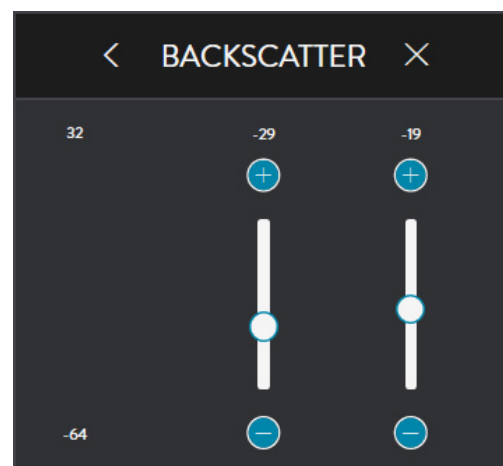


NOTE: Backscatter CALIBRATE process should be run prior to using the Backscatter overlay.

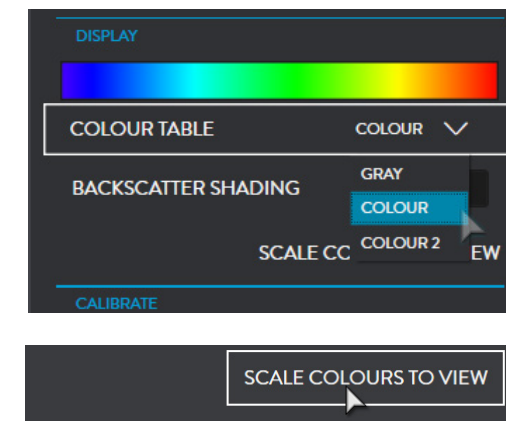
The backscatter control allows setting the backscatter colour range.

To change the colour range drag the minimum and maximum indicators on the slider controls.

The histogram alongside the colour range controls indicates the actual spread of backscatter intensity currently displayed in the panel.



The backscatter display can either be shown as greyscale or colour scale using the **COLOUR TABLE** selection.



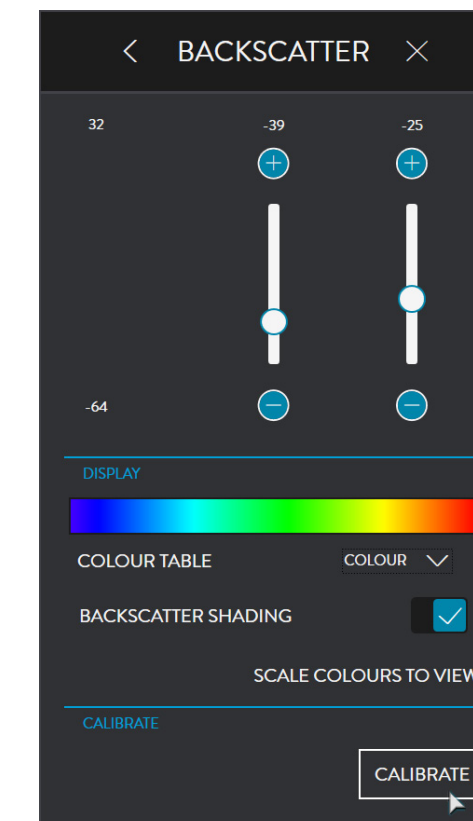
The display range can be automatically adjusted to be optimal for the data by using the **SCALE COLOURS TO VIEW** button. This selects the colour range to fit the intensity histogram.

CALIBRATE: Backscatter calibration is run to compensate for system characteristics that may cause artefacts on the backscatter display. Specifically this compensates for the transducer beam pattern variance from the nominal. Calibration requires:

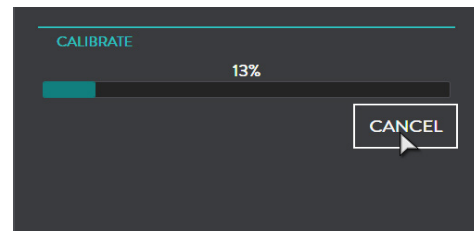
- » 10 – 50m depth
- » Flat seafloor with consistent seafloor type
- » Calm conditions
- » At least 200m straight run

To run the Backscatter calibration:

1. Enable **BACKSCATTER SHADING**.
2. Line up for the calibration run and begin the calibration run.
3. Hit the **CALIBRATION** button:
 - A line across the swath will indicate Calibration routine has started.
 - The Backscatter data will adjust dynamically during the calibration run.
 - A 2nd line across the swath will indicate when the calibration data collection has completed.
4. Once completed the Backscatter will be adjusted to compensated levels.

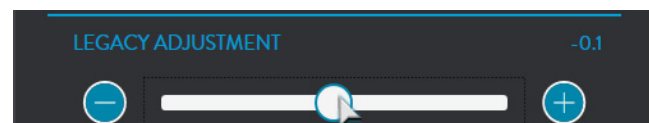


- Pressing cancel at any point during the calibration run will stop the data collection process and disregard the data.



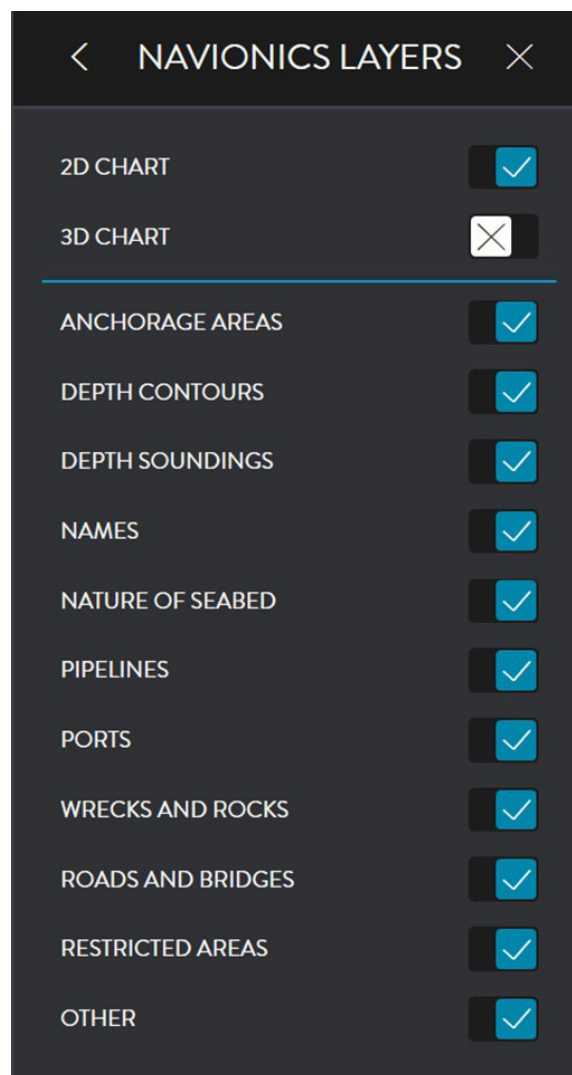
NOTE: Calibration status will be displayed during the calibration process.

LEGACY ADJUSTMENT: Backscatter on imported Navigator will have a different level to DRX generated backscatter due to calibration. Legacy adjustment allows offset imported Navigator layers to better match DRX data.



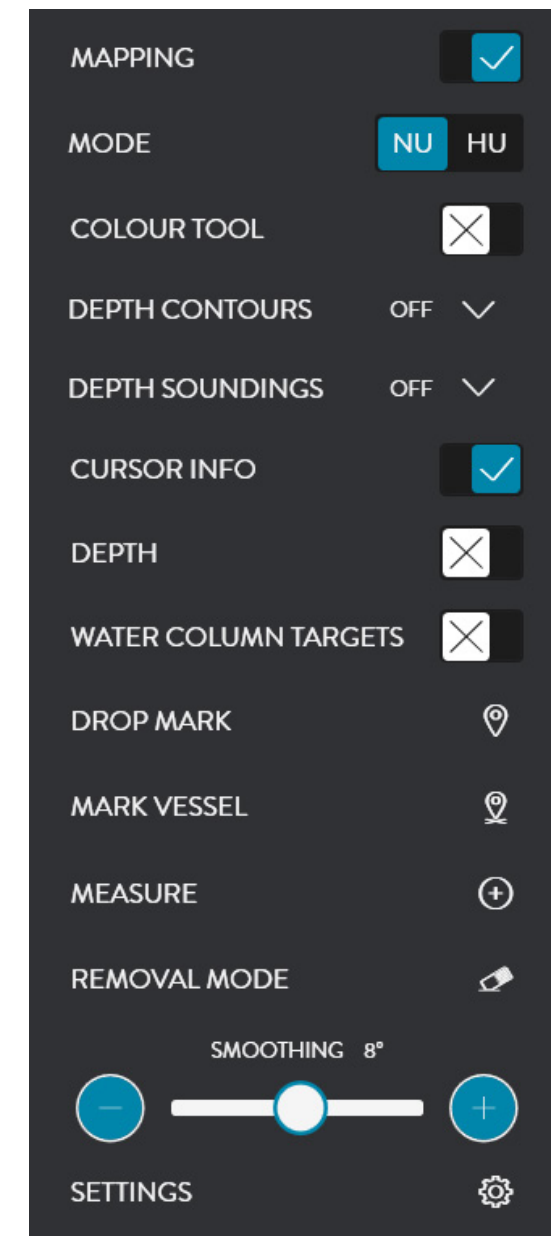
4.3.1.8. Navionics Layers

By selecting **NAVIONICS LAYERS**, specific charting cartography layers can be enabled or disabled.



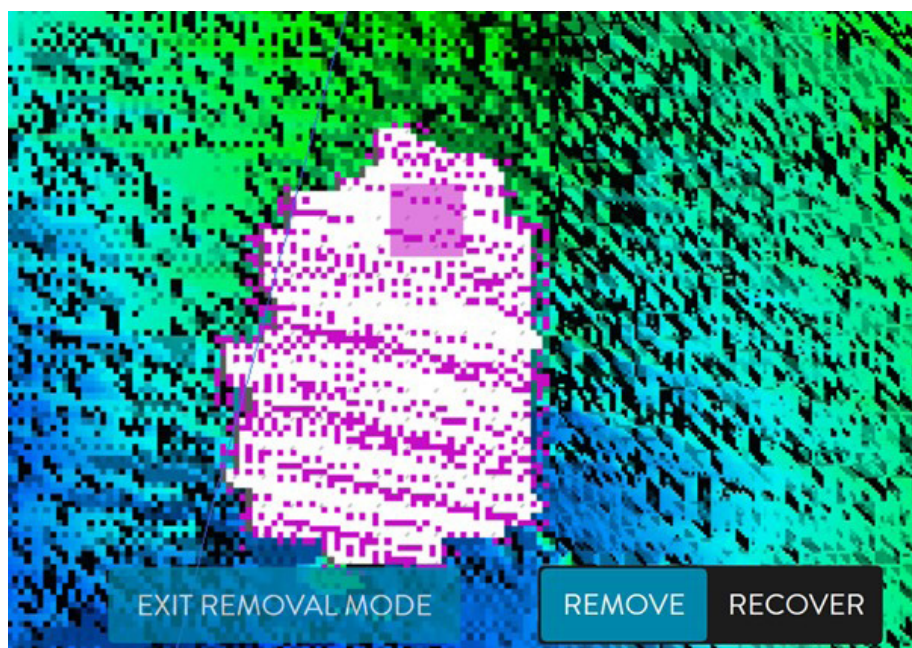
4.3.2. 2D Chart CSM

To access the 2D CSM, right-click on the Display Panel:

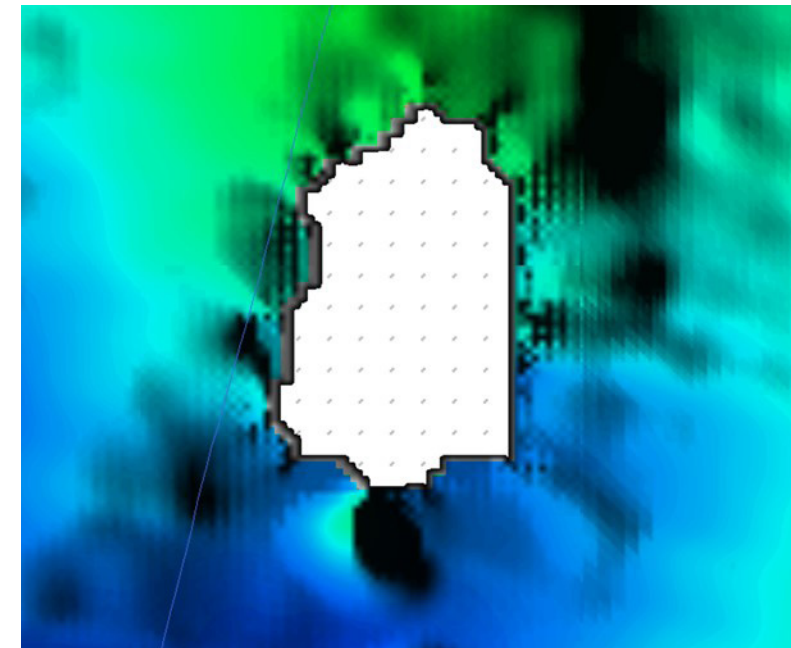


MAPPING	Disables and enables MAPPING .
MODE	Toggles between NU (North Up) and HU (Head Up) chart display.
COLOUR TOOL	Displays the COLOUR TOOL . See "4.3.1.3. Colour Tool" on page 56.
DEPTH CONTOURS	Displays contour lines where auto sets 10 contour lines distributed over the colour range set. Manual options can be selected to set a fixed depth between the contour lines.
DEPTH SOUNDINGS	Displays on the contour lines only or on the contour lines and on the shallowest and deepest parts on the chart where low, med and high will change the number of depth numbers visible on the chart.

CURSOR INFO	Displays the Information display as an overlay on the Display Panel.
DEPTH	Displays the Depth display as an overlay on the Display Panel.
WATER COLUMN TARGETS	When enabled, target detections in the water column will be displayed on the 2D and 3D Chart panels. <i>See "4.3.1.6. Water Column Targets" on page 58.</i>
DROP MARK	Places a mark at the cursor position. To modify or delete this mark, right-click on the symbol and a sub menu will appear. <i>See "5.1. Marks" on page 72.</i>
MARK VESSEL	Places a mark at the vessel position.
MEASURE	Used to measure the distance between two points and to give a profile of the seafloor between those two points. <i>See "5.2. Measure Tool" on page 74.</i>
REMOVAL MODE	Allows the user to remove data by clicking on data with the pink square. In this mode the resolution of the data is set to the highest level to allow the user to carefully select detections on the chart display. Removing large areas at the same time can be achieved by zooming out on the chart as this will make the pink square cover a larger area. Removed detections will be visible in pink whilst in removal mode.



Exiting **REMOVAL MODE** will reset the resolution level back and the removed data will no longer be visible.



Removed data can be recovered at any time using the **RECOVER** option. The area to be recovered can be selected using the pink square. When in **REMOVAL MODE** the **RECOVER** option lets you select the detection in the same way as the **REMOVE** process with the pink square, however in the **RECOVER** mode the removed data will become visible again.



SMOOTHING

A low value will show a detailed presentation of all the mapped data and a high value will show a smooth presentation of all the mapped data on the chart. A low value could cause gaps between the detections and inaccuracies could be exposed. If this occurs the smoothing value can be raised to avoid this.



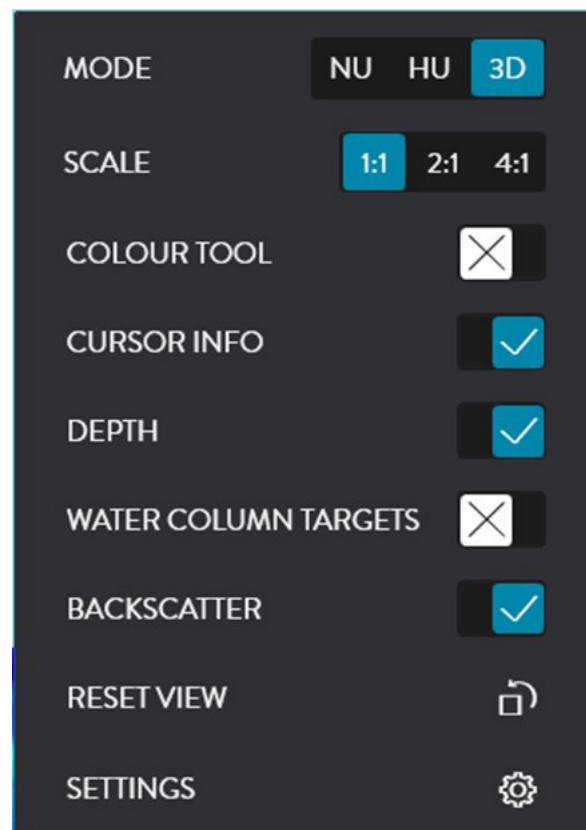
NOTE: Changing this setting does not impact the stored detection points in the database, only the presentation of the data in CDX.

SETTINGS

This option will display the **CHART** Menu. *See "4.3.1. Chart Configuration Options" on page 46.*

4.3.3. 3D Chart CSM

To access the 3D CSM, right-click on the Display Panel:



MODE	Toggles between NU (North Up), HU (Head Up) and FREE ROTATE which allows user orientation of Vessel and chart; left-click the cursor and drag.
SCALE	Scale options allow the vertical scale of the 3D display to be changed whilst horizontal scale remains the same. This will accentuate seafloor features.
COLOUR TOOL	Displays the COLOUR TOOL . See "4.3.1.3. Colour Tool" on page 56.
CURSOR INFO	Displays the Information display as an overlay on the Display Panel.
DEPTH	Displays the Depth display as an overlay on the Display Panel.
WATER COLUMN TARGETS	When enabled, target detections in the water column will be displayed on the 2D and 3D Chart panels. See "4.3.1.6. Water Column Targets" on page 58.
BACKSCATTER	Displays Backscatter. See "4.3.1.7. Backscatter" on page 60.
RESET VIEW	This will reset view to its native resolution.
SETTINGS	This option will display the CHART Menu. See "4.3. Chart" on page 53.



NOTE: 3D Chart control is bound to the 2D control which means that display control on 2D will impact the 3D display.



NOTE: Cursor info only displays depth at the cursor on mapped Bathymetry.

4.3.4. Database

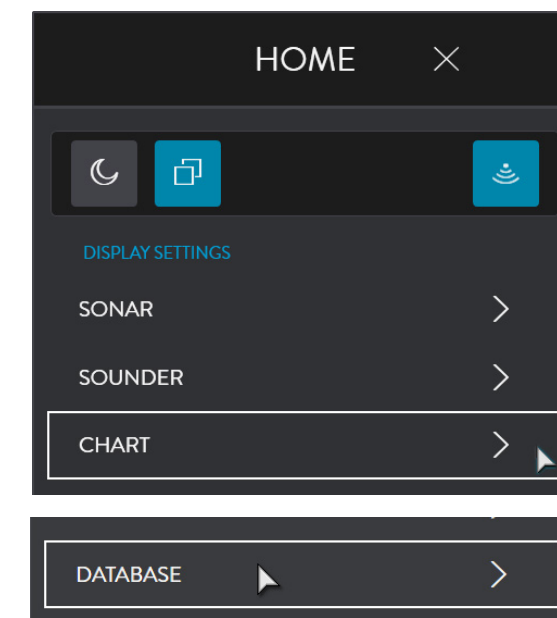
The Mapping Database is used for all **WASSP CDX** data storage.

The **DATABASE** is used to set up the Mapping Database. Bathymetric data from the DRX will be saved to the database you select.

The **DATABASE** section can also be used for importing data such as Navigator data from previous versions of WASSP.

To access the **DATABASE** menu pages:

1. From the **HOME** bar, under **DISPLAY SETTINGS**, select **CHART**.

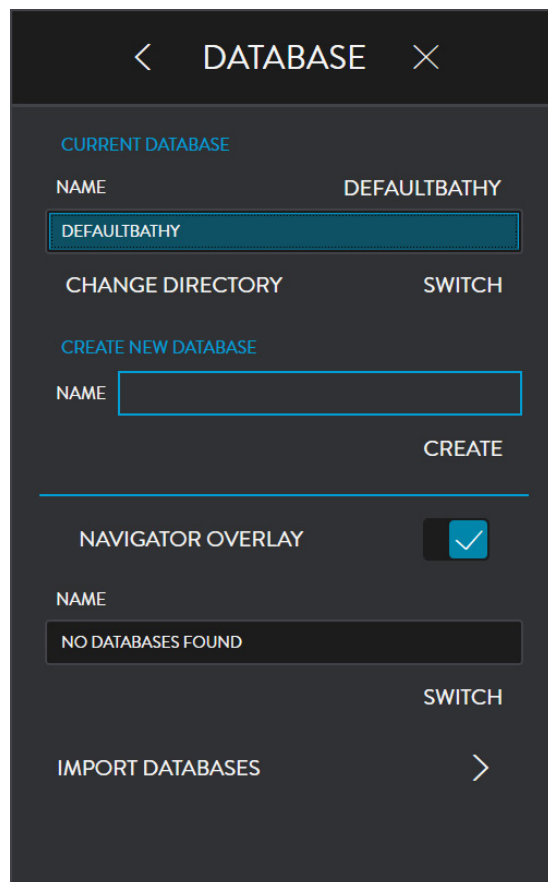


2. Select **DATABASE**.

Database management menu options will be available.

All database management is carried out on the selected database location.

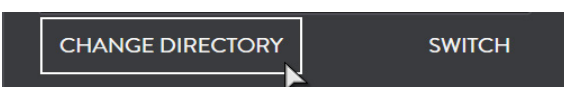
The selected database location is used for database creation, database selection and Navigator database import location.



3. The selected database location can be changed.

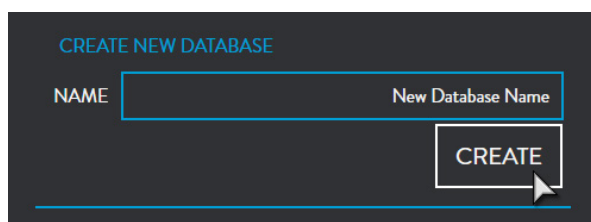
Selecting **CHANGE DIRECTORY** will bring up a **BROWSE FOR FOLDER** window with the currently selected location highlighted.

Selecting and saving a different location will update the selected database location.



4.3.4.1. To Create a New Database

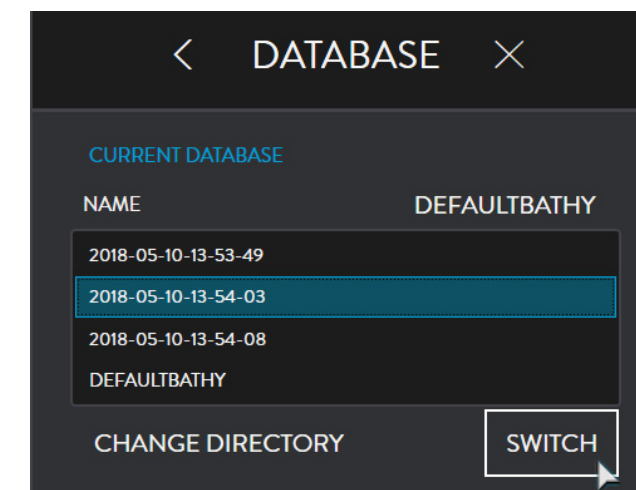
1. Under **CREATE NEW DATABASE** type in a name for the database.
2. Click **CREATE**. The created database will appear in the database list. See "4.3.4.2. To Select a Database" on page 68.



4.3.4.2. To Select a Database

Bathymetric data will be recorded to the currently selected database.

1. Select a database from the list of available databases in the list box. Click **SWITCH**.
2. The current database used in the Chart panels will appear under **CURRENT DATABASE**.



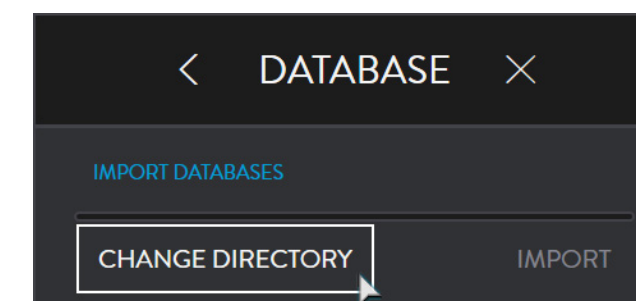
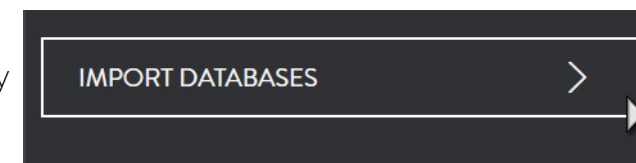
NOTE: Only databases under the select Path will be shown in the database selection list. **CHANGE DIRECTORY** to view databases stored in other locations.

4.3.4.3. Navigator Overlay

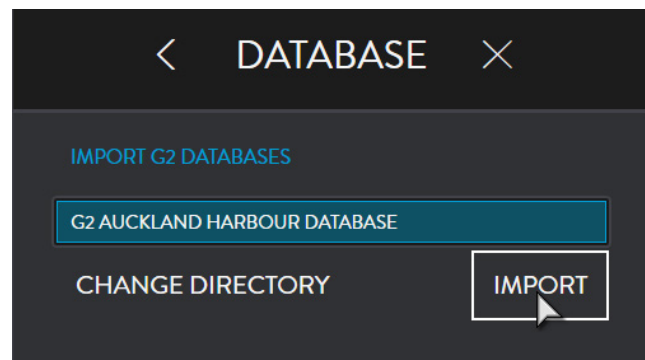
Navigator data from previous versions of WASSP can be imported and viewed as an overlay on the Chart Panels.

The Navigator database can be imported by selecting **IMPORT DATABASES**.

1. Select **CHANGE DIRECTORY**. This will bring up a **BROWSE FOR FOLDER**. Select the location of the original Navigator databases to be imported.



2. Select the Navigator database to be imported.
3. Select **IMPORT**.

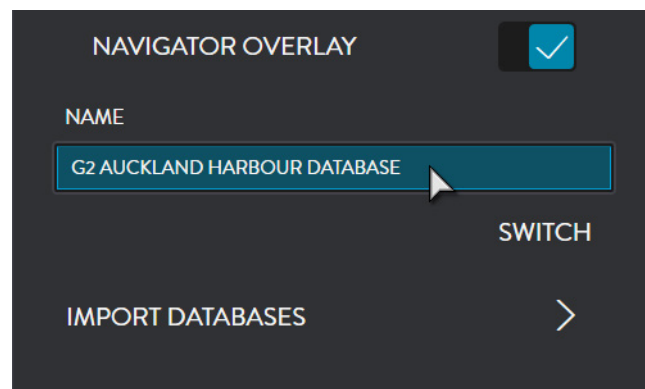


Once imported, the Navigator databases can be viewed as an overlay on the chart panel.

1. Select the **NAVIGATOR OVERLAY**,

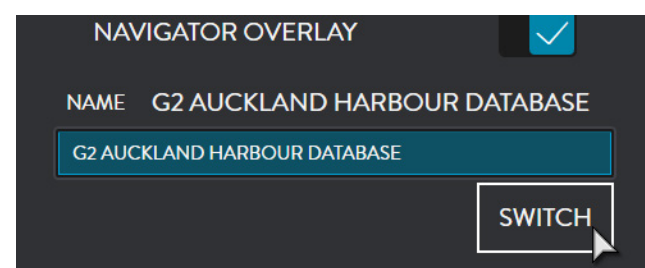


2. The imported databases will appear in the selection list for **NAVIGATOR OVERLAY**. Select the imported Navigator database to overlay.



3. Select **SWITCH**.

The Navigator database will now be overlaid on the Chart Panels.

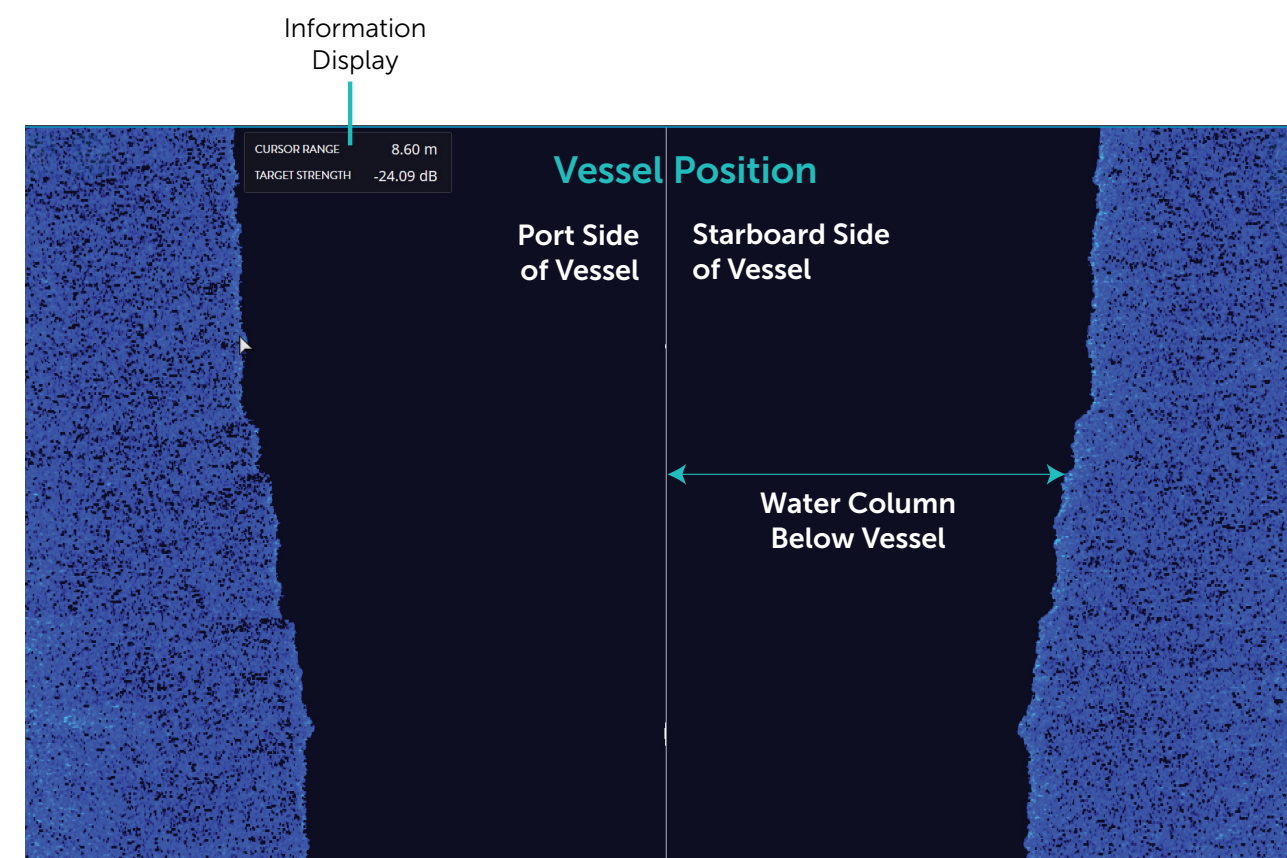


NOTE: If the Selected database location, see "4.3.4. Database" on page 67, is changed the imported navigator databases will not appear in the selection list.

4.4. SIDESCAN

SIDESCAN is displayed similarly to traditional sidescan with the seabed drawn on either side of the vessel position with a scrolling history displayed behind the vessel position.

SIDESCAN is not georeferenced so is depicted as a flat seafloor but as can be seen in the image, seafloor artefacts and other changes or objects are clearly defined through the shadowing effect of these objects.



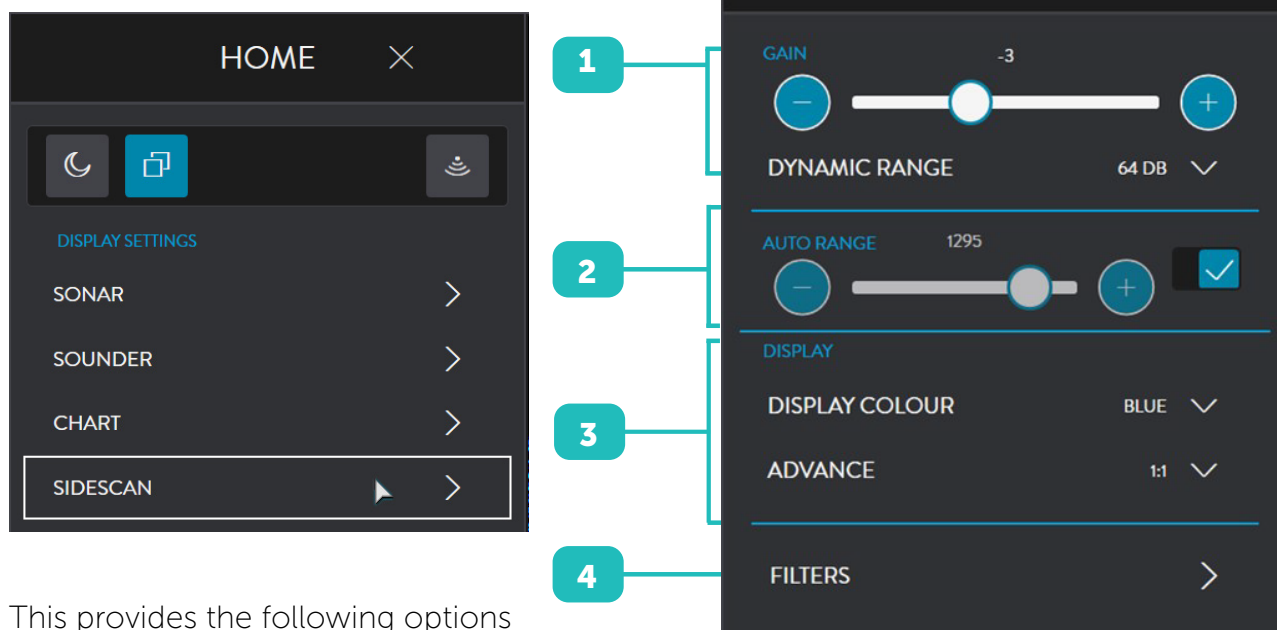
INFORMATION DISPLAY

Supplies following information at the cursor:

- » Cursor Range
- » Target Strength

4.4.1. Sidescan Configuration Options

From the **HOME** bar, select **SIDESCAN**.



This provides the following options (shown opposite):

- 1

GAIN

GAIN and **DYNAMIC RANGE** are used to optimise the Sounder display to the user preference.
See "4.2.1.1. Gain" on page 47.
- 2

AUTO RANGE

DRX control for setting ping / transmit range for the system.
See "4.1.1.2. Auto Range" on page 43.
- 3

DISPLAY

Controls for display settings. *See "4.2.1.2. Display" on page 48.*

DISPLAY COLOUR allows colour palette selection.
ADVANCE option allows for advancing the Echogram scroll at the required rate.
- 4

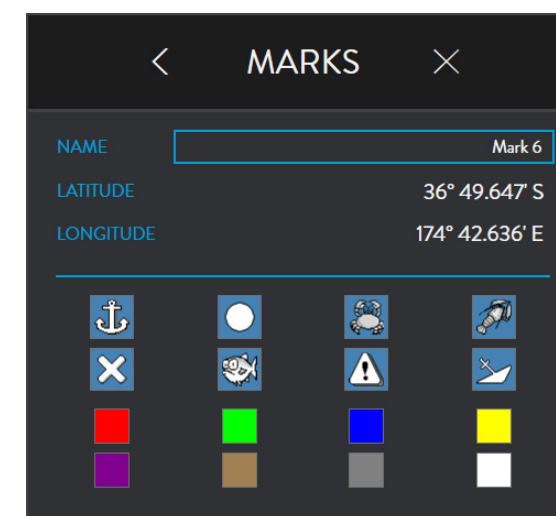
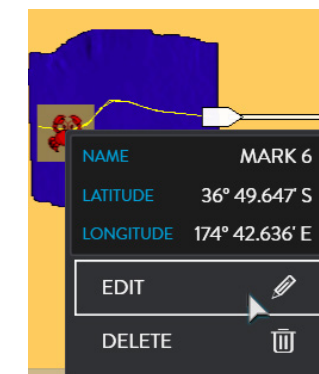
FILTERS

Allows adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality. *See "3.2.5. Filter Setup" on page 22.*

The **MARKS** setting can be accessed from CSMs in Charting and Sounder Display Panels and by right-clicking on a **MARK** and selecting **EDIT**.

The **MARK** setting can be used to:

- » Select **MARK ICON**.
- » Select **MARK COLOUR**.
- » Edit **MARK NAME**.



There are colour options for each mark. To change colour, click on the colour box you require e.g. yellow:

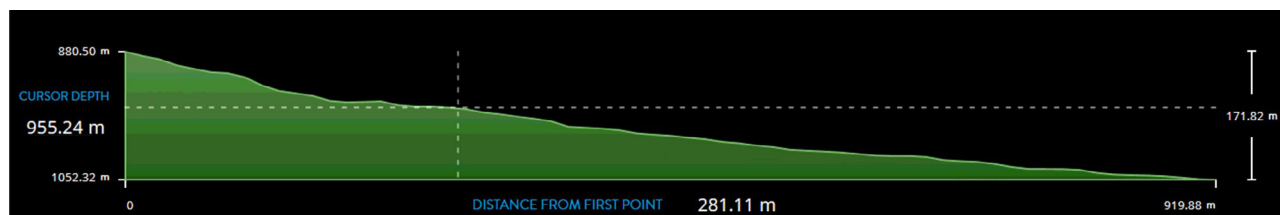
5 TOOLS

5.1. MARKS

5.2. MEASURE TOOL

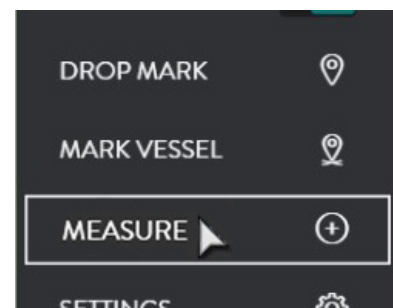
The **MEASURE TOOL** can be used to measure the distance between two points and to give a profile of the seafloor between those two points.

Mousing over the **MEASURE TOOL** will display depth and distances.



To select the measure area that will be profiled:

1. Select **START MEASURE** from the CSM.



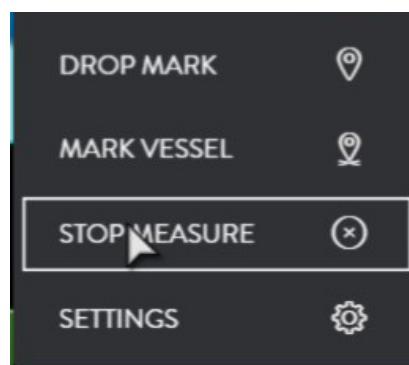
2. Drag the **START MEASURE** Indicator to required start position and left-click to lock Start position.



3. Drag the **END MEASURE** Indicator to required finish position and left-click to lock End position.

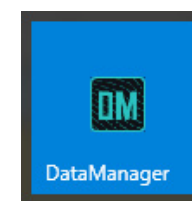
4. The measure and profile will be dynamically updated on the measure tool.

5. The **START MEASURE INDICATOR** and **END MEASURE** Indicator can be selected by hovering over, left-click and drag to a new position for profiling.



6. To remove the Measure tool from the Panel select **STOP MEASURE** on the CSM.

6 DATA MANAGER

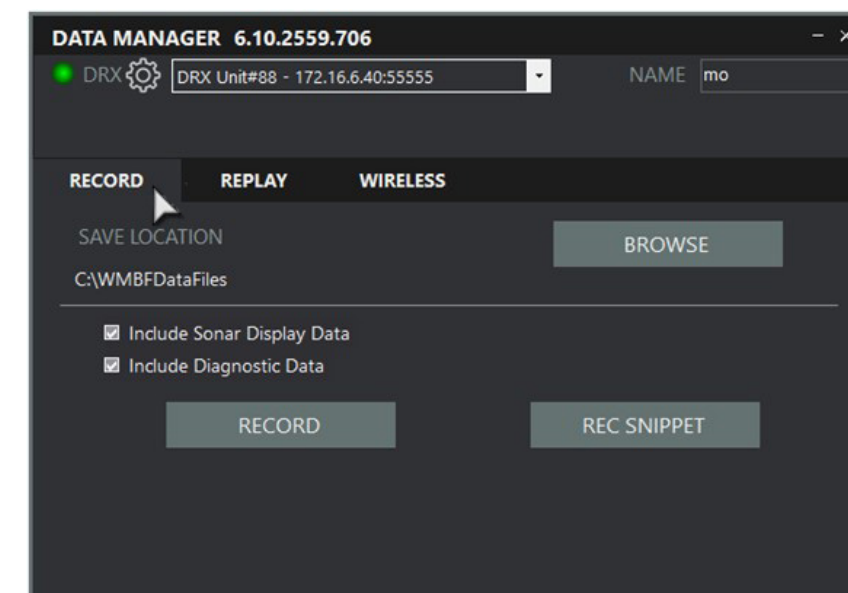


DATA MANAGER is used for recording and replaying data from the DRX. **DATA MANAGER** can also be used for exporting recorded data into different file formats for offline processing.

DATA MANAGER is installed with **CDX** but is launched as an independent application.

6.1. DATA MANAGER RECORD

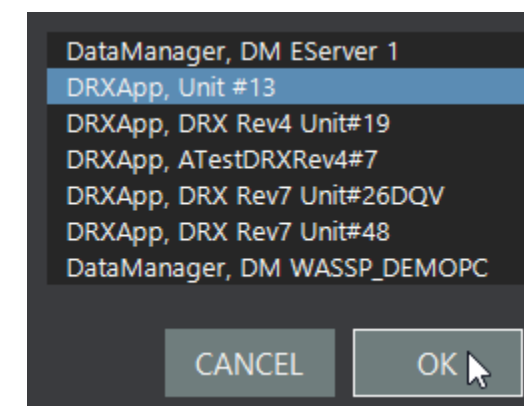
1. Click on the **RECORD** tab.



2. Connect to the DRX that you want to Record data from.
3. Click on the **SCAN** button to view DRXs on the network.



4. Select the DRX and click **OK**.



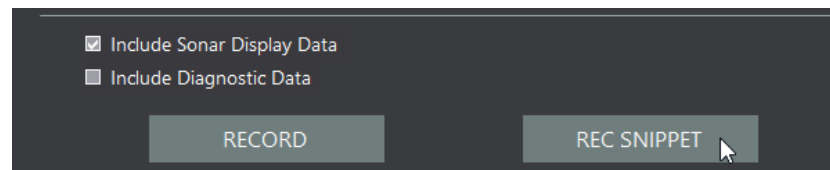
- Select the location that you want to store your files to by clicking on **BROWSE** under **SAVE LOCATION**.



- Click on **RECORD** to start recording and **STOP** to stop recording.



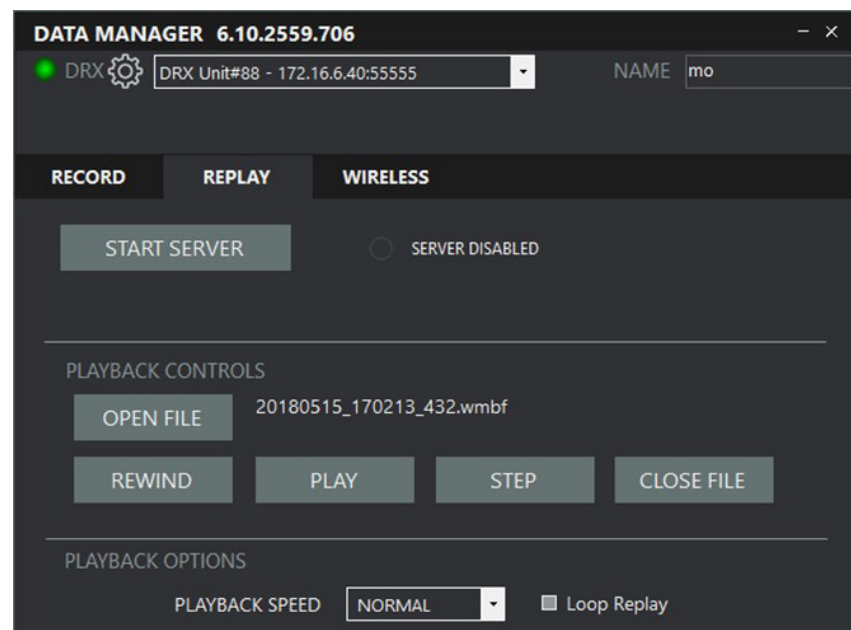
- When recording there are some options:



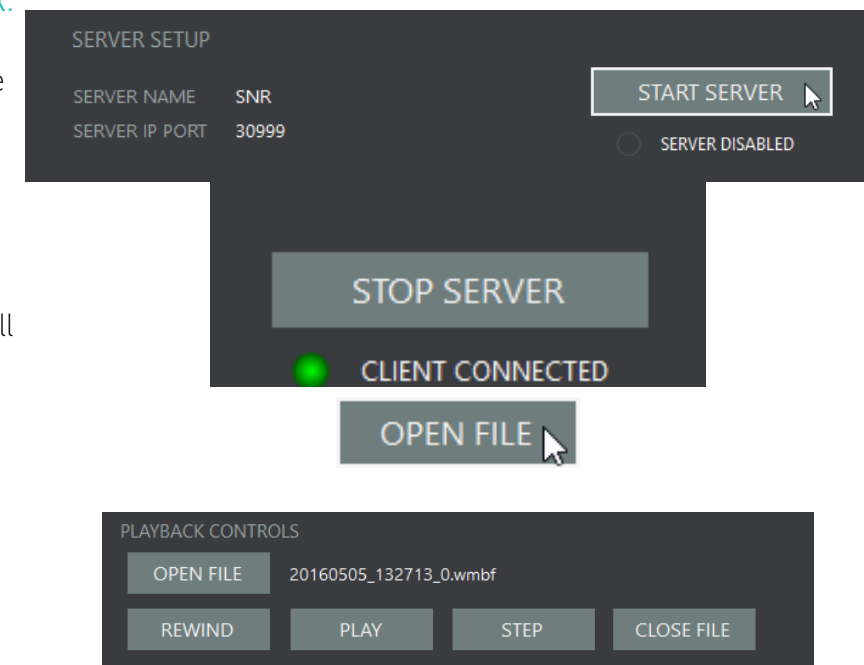
- » 'Include Sonar Display Data' will record Sonar data as well as bathymetric data. This will result in medium size files.
- » 'Include Diagnostics Data' will record the full raw data useful for technician analysis. However, it will result in very large files.
- » **REC SNIPPET** will record enough full raw data for a short period of time. This data is useful for technician analysis of issues without recording overly large files.

6.2. DATA MANAGER REPLAY

- Click on the **REPLAY** tab.



- Click on **START SERVER**. This allows Data Manager to be available to client applications such as CDX.
- Once a client application is successfully connected the connection icon will display green.
- A playback file can be selected using the **OPEN FILE** button.
- PLAYBACK CONTROLS** can then be used to control the playback.



NOTE: In Replay mode Data Manager appears as a DRX to client applications and can be selected in DEVICE SETUP in CDX. See "3.1. Device Setup" on page 13.

6.3. EXPORT

The **EXPORT** tab is only visible when the WASSP dongle plugged into the PC has a license for one of the export options.

- XYZ** Enables conversion of a WASSP recording (.WMBF file) into XYZ (requires XYZ export license on the WASSP dongle).
- GSF** Enables conversion of a WMBF WASSP recording (.WMBF file) into GSF (requires Survey license on the DRX while operating and GSF export license on the WASSP dongle).
- ECHOVIEW** Enables conversion of a WMBF WASSP recording (.WMBF file) into Echoview (requires Survey license on the DRX while operating and Echoview export license on the WASSP dongle).

7 APPENDIX

APPENDIX A - PC

PC SPEC

	MINIMUM	RECOMMENDED
OS	Windows 7, 8.1, 10	Windows 10
CPU <i>Base Frequency</i>	2GHz	2GHz
<i>Cores/Threads</i>	2/4	4/4
Memory	4GB*	8GB
Graphics	DirectX 11	DirectX 11
Screen Resolution	1024x768	FHD - 1920x1080
HDD/SDD**	500GB SSD	2TB SSD
Network <i>Ethernet</i>	GbE	GbE
<i>Wi-Fi***</i>	802.11ac	802.11ac

* Running OS and CDX only and graphics card has its own memory

** If data storage limits are approached there will be a user warning and mapping will be disabled until disk space is freed up.

*** Optional depending on setup if wifi is required.

Example of WASSP supported PCs:

- » Low end PCs
 - Intel NUC5i3RYK

- » Tablets
 - ToughPad FZ-GI
 - Microsoft Surface Pro 4

- » Ruggedised PCs
 - ADLINK MXE-5400

APPENDIX B - NMEA SUPPORTED SENTANCES

Own vessel position and heading data:	NMEA
Position	GGL, RMC, GGA
Heading	HDT
Speed and Course	RMC, VTG

