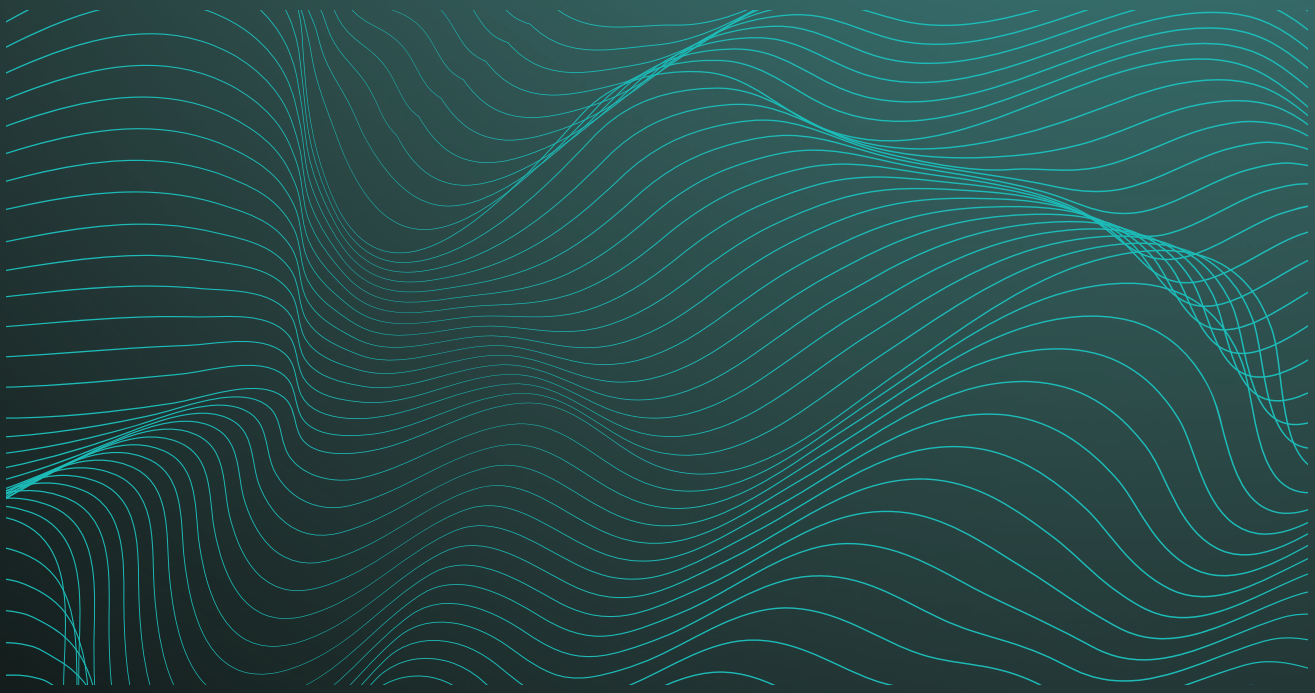
WASSP CDX OPERATORS MANUAL
QUICKSTART GUIDE



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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

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

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Support information

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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.

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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.

CDX OPERATORS MANUAL

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.

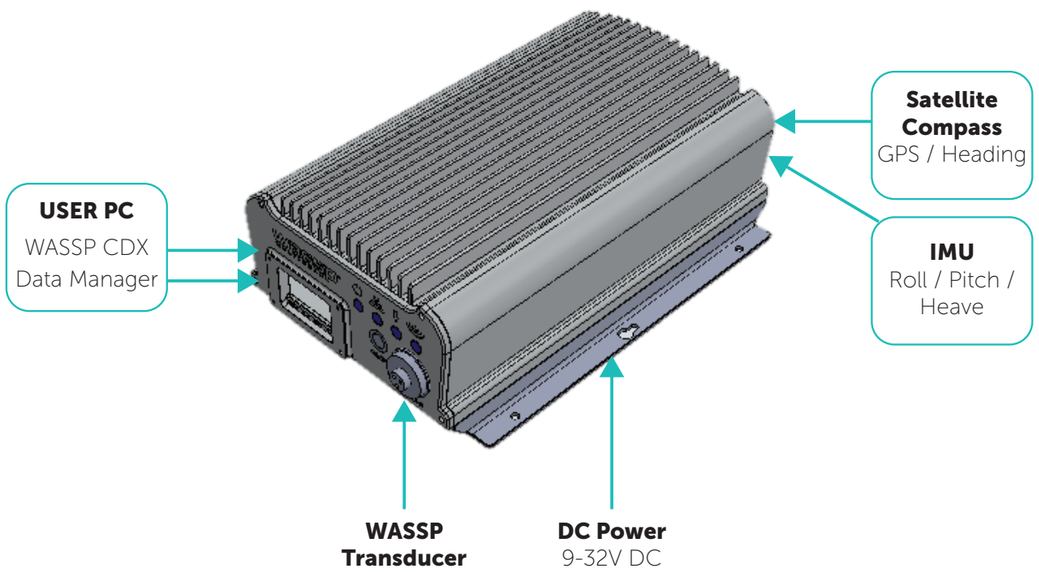


Figure 1. DRX Recommended System

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).

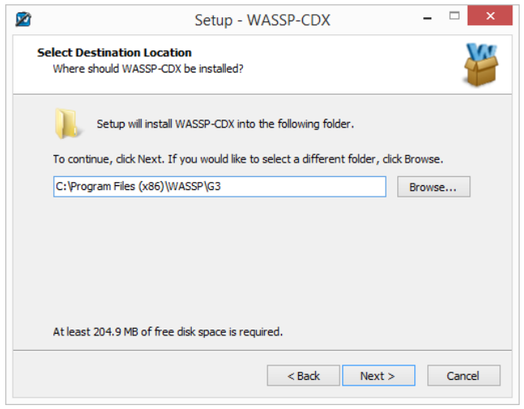
If there is a DHCP server on the LAN the DRX will be assigned an appropriate IP address by the DHCP server. If there is no DHCP server, the DRX will fall through to Zero-configuration assignment in block 169.254.0.0/16. Any connected device will need to be assigned an appropriate IP address on the same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

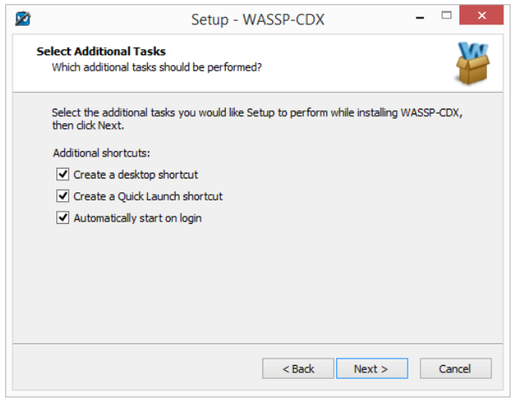
1.2. INSTALLATION

WASSP CDX can be installed on any device that meets the minimum spec described in *"Appendix A - PC SPEC" on page 63.*

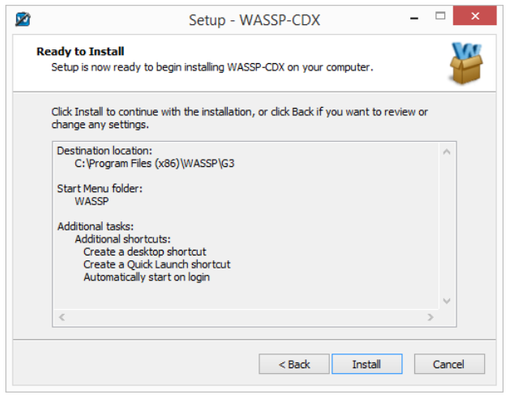
1. From WINDOWS START run WASSP CDX SETUP

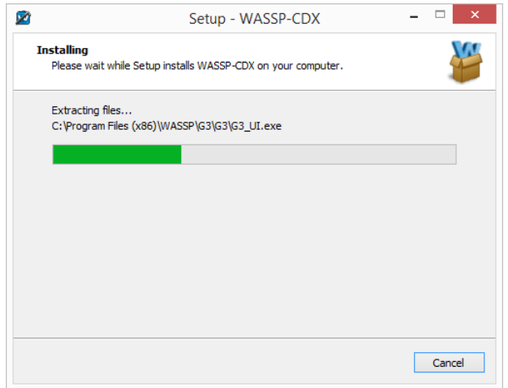


Select NEXT

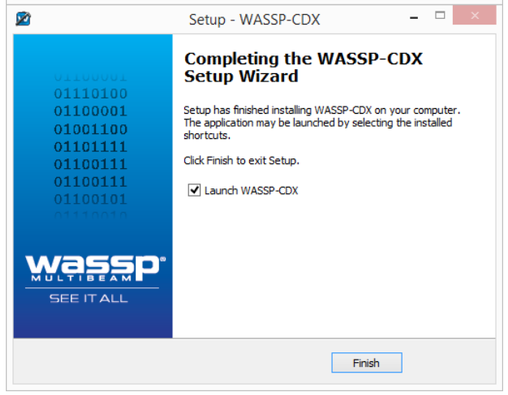


Select INSTALL



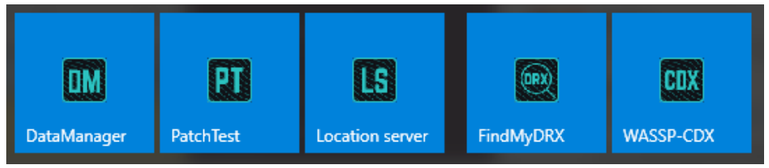


Select FINISH



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
- Location Server; For own-vessel navigation data in wireless mode
- Find My DRX; For identifying DRXs on the network

2 APPLICATION OVERVIEW

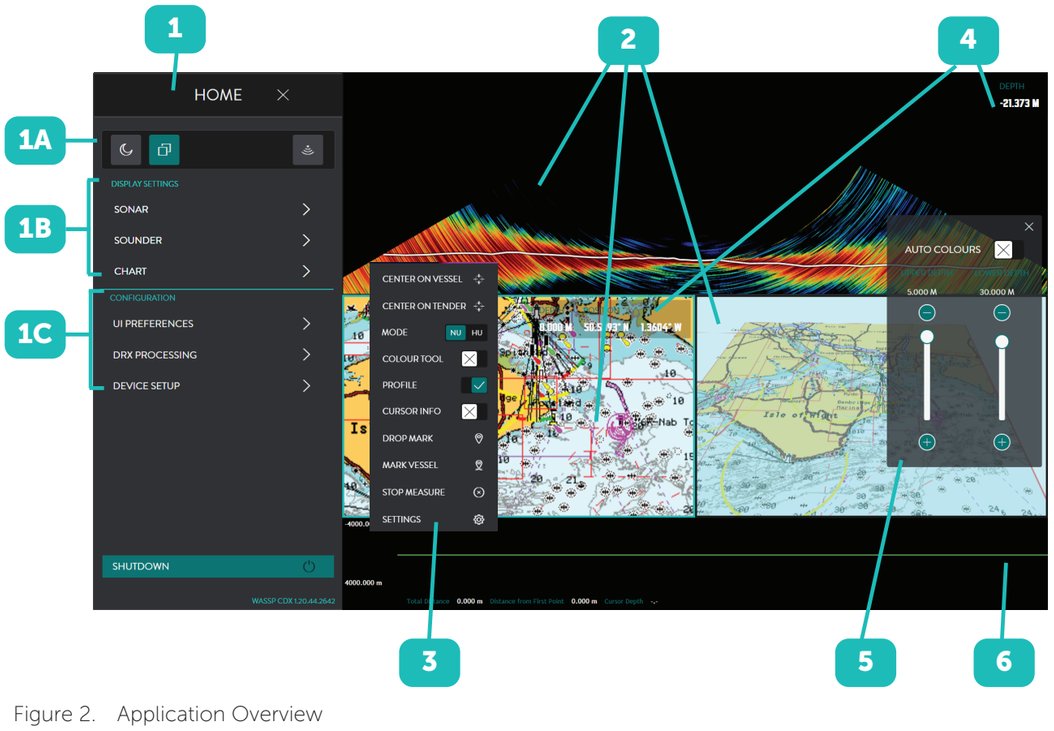


Figure 2. Application Overview

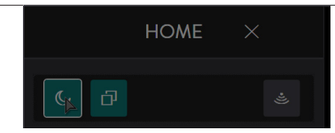
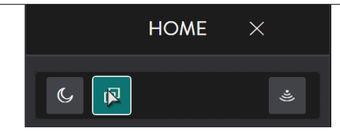
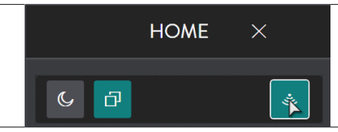
1	HOME BAR	Provides configuration options for the Display Panels, Layout, Tools, System Setup and User Preferences. The HOME bar is accessed through the HOME button. 1A: Quick Access Bar: *See "2.1. Quick Access Bar" on page 9.* 1B: Display Panel Setup: *See "4 Display Panel Settings" on page 32.* 1C: Configuration of CDX (UI PREFERENCES), DRX (DRX PROCESSING) and system setup (DEVICE SETUP). *See "3 System Set Up" on page 10.*
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 "3.3.8. Night Mode" on page 29* for full control.	
LAYOUTS button *see "3.4. Layout" on page 31* for Display Panel selection.	
TRANSMIT button. DRX control to transmit. Ping rate will be determined by selected range.	

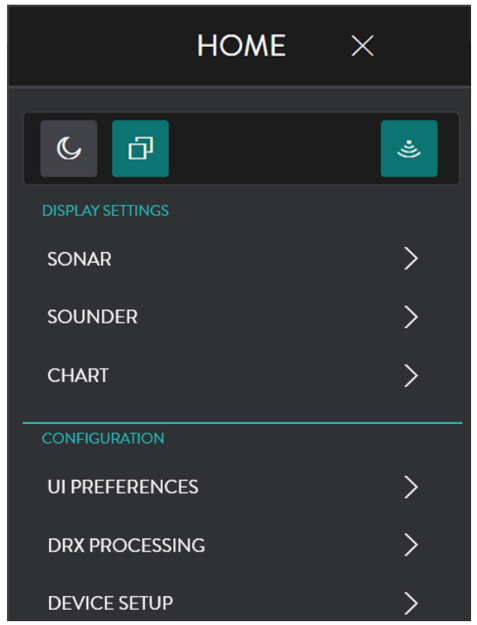
3 SYSTEM SET UP

3.1. DEVICE SETUP

For full details on network configuration see DRX Installation Manual.

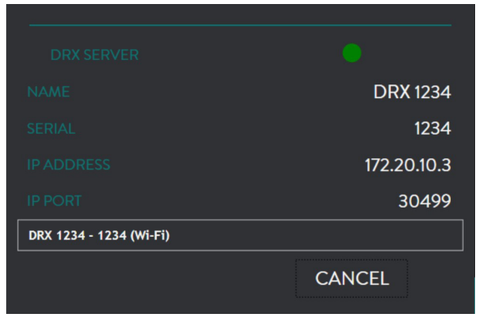
1. After installing the WASSP CDX on your PC, start the DRX and run WASSP CDX.
2. WASSP CDX will automatically select the DRX as long as the network has been correctly configured.
3. To manually select the DRX you wish to connect to:

   From the HOME bar, under CONFIGURATION select DEVICE SETUP.



4. The DEVICE SETUP page displays the current (or previous) connection.

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



5. Select your desired connection.
6. 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 Tools and Utilities" on page 60.*

3.1.1. Wireless Server

WASSP CDX can be configured to be used in a wireless configuration for remote mapping being transmitted from a TENDER to the PRIMARY vessel. The mapping data from the TENDER will be transmitted to the PRIMARY vessel real-time as well as off-line when the TENDER goes out of wireless range for a period of time.

A typical wireless configuration can be seen in *"Appendix B - Simplified Wireless Configuration" on page 64.*

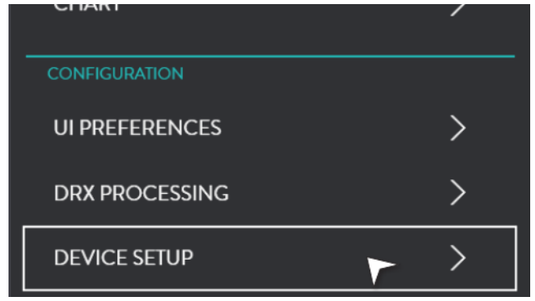
Setting up CDX for wireless connectivity consists of:

- » Setting up the TENDER vessel
- » Configuring PRIMARY vessel for receiving own vessel navigation data
- » Setting up the PRIMARY vessel

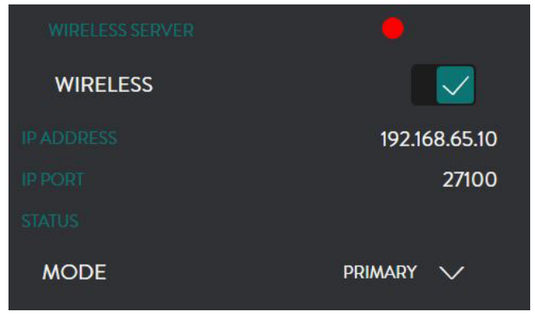
Setting up the 'Tender' vessel

1. Open %APPDATA%/WASSP/G3/UI file location.
2. Create a text file and name it wirelessip
3. In the TENDER wirelessip text file enter the IP address of the PRIMARY WASSP CDX installation.
4. Open WASSP CDX on the Tender computer.

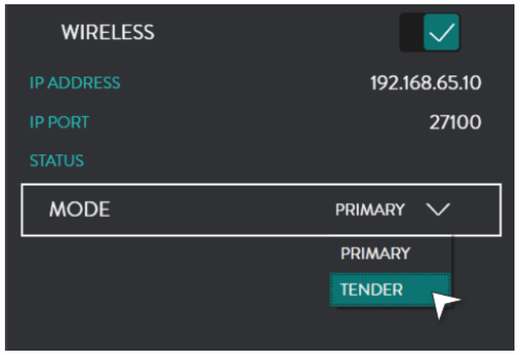
   From the HOME bar, under CONFIGURATION select DEVICE SETUP.



5. Under WIRELESS SERVER enable WIRELESS.



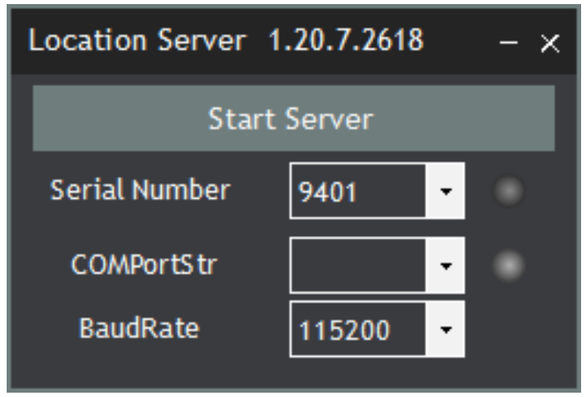
6. Set MODE to TENDER.



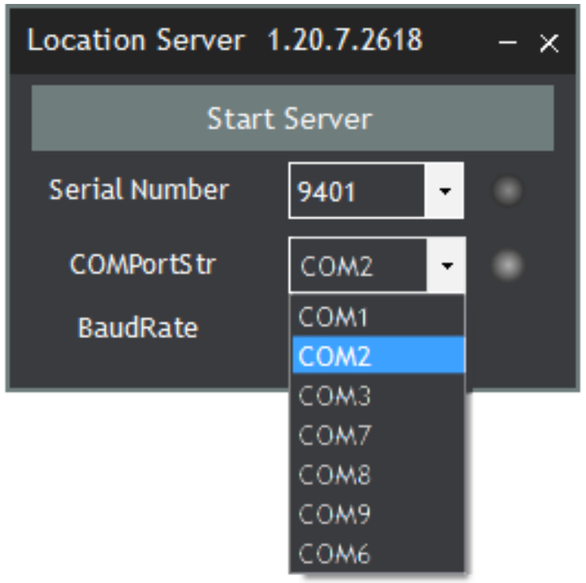
Configuring the 'Primary' Vessel for receiving own vessel navigation data

The LOCATION SERVER enables WASSP CDX to display own vessel position and heading.

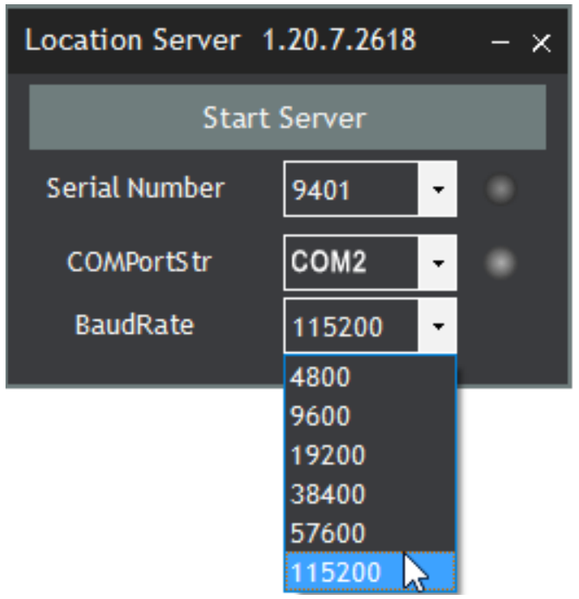
1. From WINDOWS START launch LOCATION SERVER.



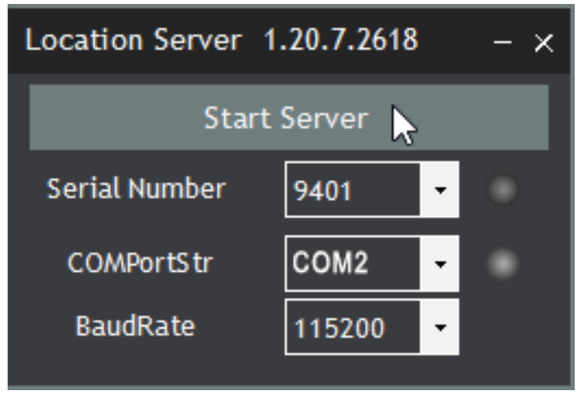
2. Set COMPORTSTR to the comport that is used for the Primary's heading and location port.



3. Set the BAUDRATE.



4. Select START SERVER to start the server.



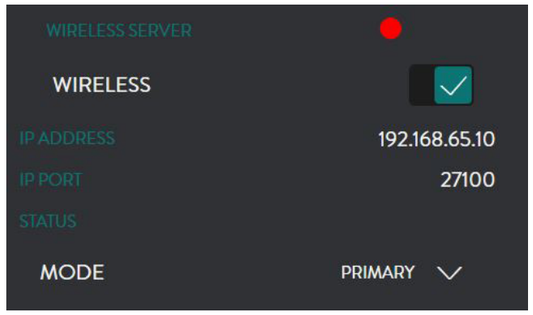
Setting up the 'Primary' vessel

1. Open %APPDATA%/WASSP/G3/UI file location.
2. Create a text file and name it wirelessip
3. In the PRIMARY wirelessip text file enter the IP address of the TENDER WASSP CDX installation.

4. Open WASSP CDX on the Primary computer.

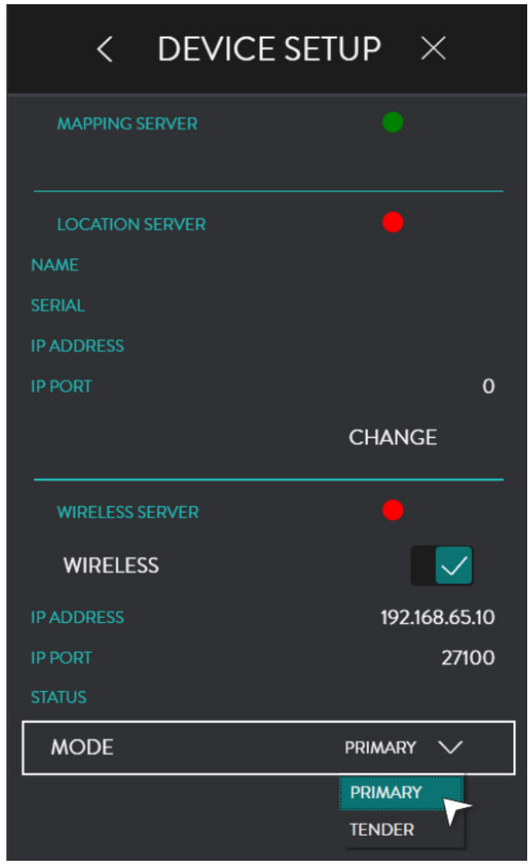
   From the HOME BAR, under CONFIGURATION select DEVICE SETUP.

5. Under WIRELESS SERVER enable WIRELESS.



6. Set MODE to PRIMARY.
7. In the LOCATION SERVER section the running location server will be automatically selected.

   If there is more than one location server on the network, the CHANGE button allows selection of the appropriate Location Server.

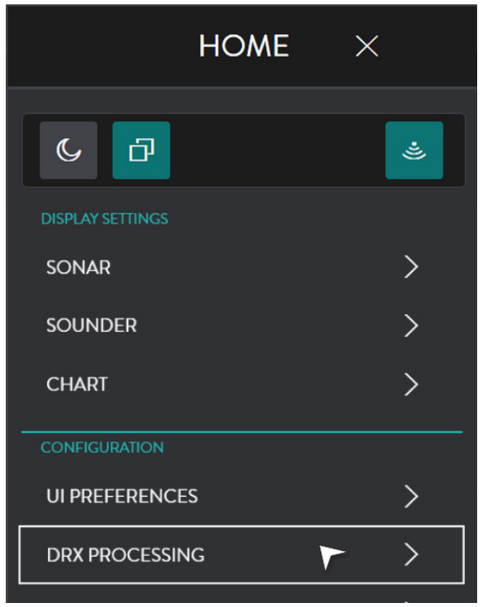


3.2. DRX PROCESSING CONFIGURATION

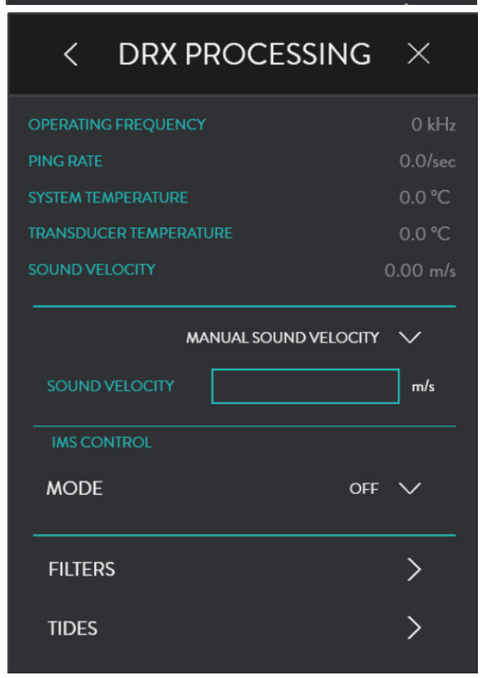
3.2.1. DRX Information

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 32* or the profile tool, accessed through the Chart CSM, *see "4.3.3. 2D Chart CSM" on page 51.* 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 should be increased
- » If the sea floor appears to be curving downwards at the edges (frown), the sound velocity value should be decreased

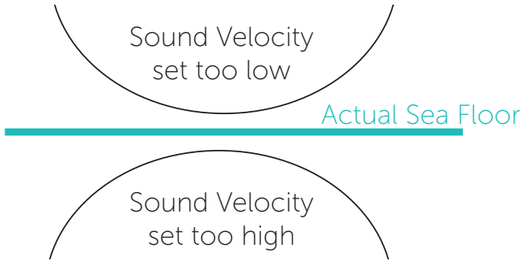
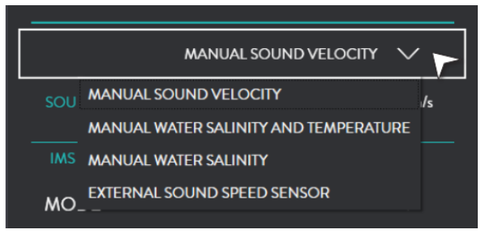
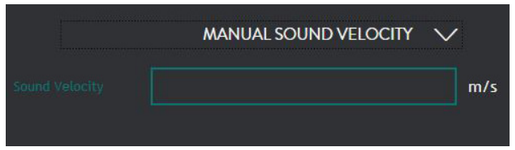


Figure 3. Seafloor inaccuracies due to incorrect sound velocity

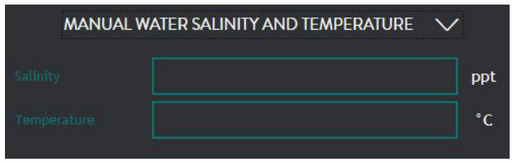
Click on the drop down menu and select the option you wish to tune: MANUAL SOUND VELOCITY; MANUAL WATER SALINITY AND TEMPERATURE; MANUAL WATER SALINITY or EXTERNAL SOUND SPEED SENSOR.



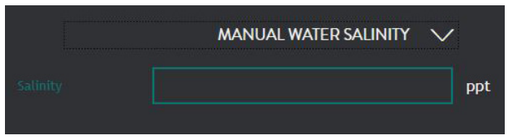
MANUAL SOUND VELOCITY; used if sound velocity is known.



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



MANUAL WATER SALINITY; can be used if DRX has a temperature input and the manual salinity will be used to derive sound velocity.



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.

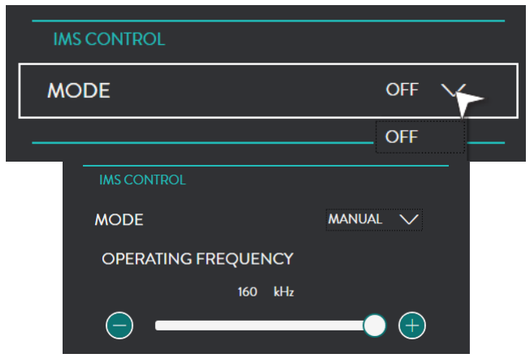
NOTE: Temperature input into DRX may be direct from transducers with temperature sensors built in or from external temperature sensor.

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.

3.2.3. IMS Control

IMS CONTROL is used for managing interfering acoustic equipment.

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.

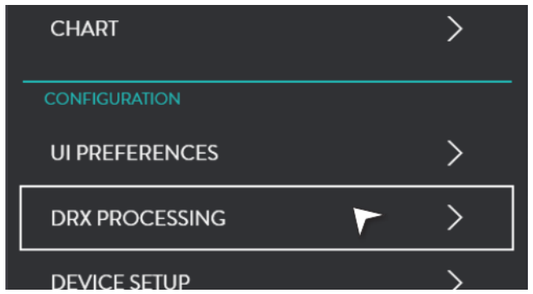


3.2.4. Filter Setup

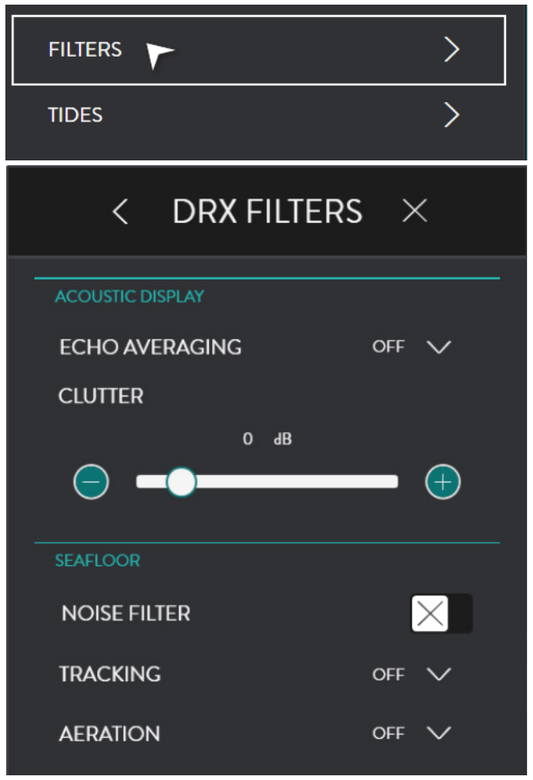
DRX FILTERS allow adjustment of signal processing filters to optimise the data and display when operating in an environment with noise, clutter and other interference impacting the data quality.

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

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



2. Select FILTERS.



3. ACOUSTIC DISPLAY: ECHO AVERAGING

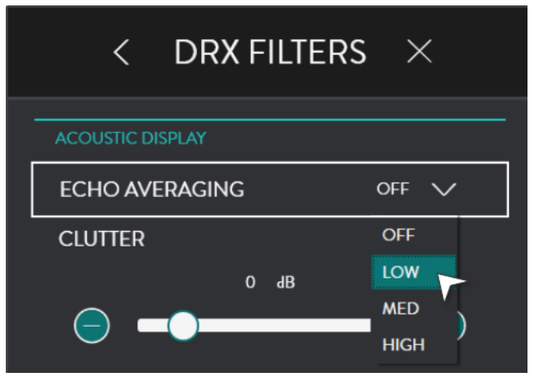
Applies to Sonar and Sounder data.

Purpose;

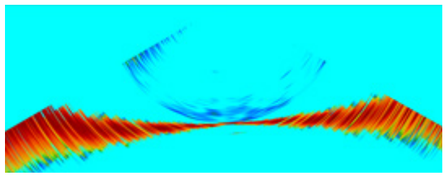
Reduction of clutter and false targets. Rejects small targets or fast changing data accentuating slow moving targets.

Disadvantage;

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

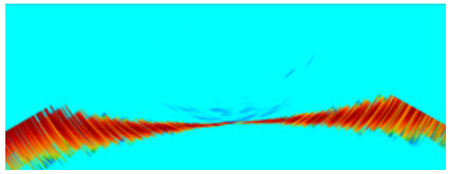


Example; OFF

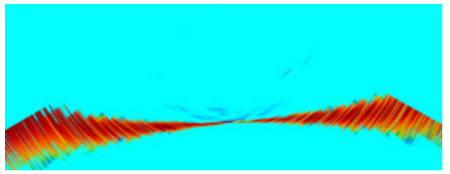


Example; LOW

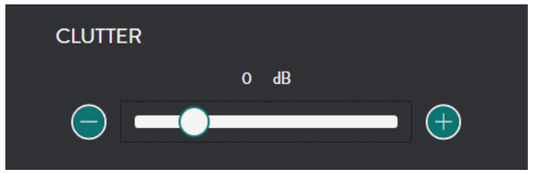
Example; MEDIUM



Example; HIGH



4. ACOUSTIC DISPLAY: CLUTTER



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

Purpose;

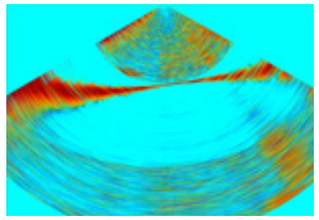
To clean the display of speckle by removing data below the specified threshold level. Allows stronger targets to be more easily identified.

Disadvantages;

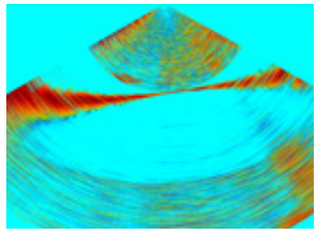
» Removes targets dependent on threshold set

» Threshold is relative to noise level so targets may be lost with increased depth

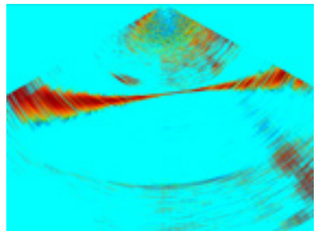
Example; -6dB



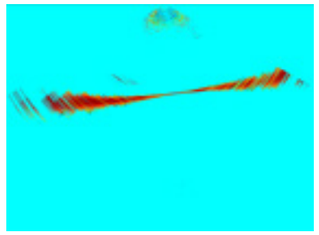
Example; +6dB



Example; +16dB



Example; +30dB



5. SEAFLOOR: NOISE FILTER

Applies to Bathymetry charting data.

Purpose;

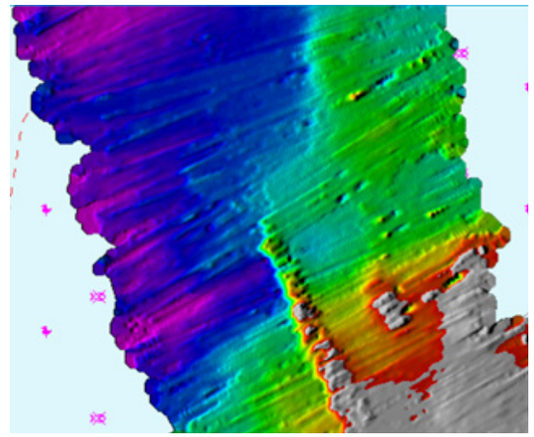
To remove single ping tracking errors through averaging.

Disadvantages;

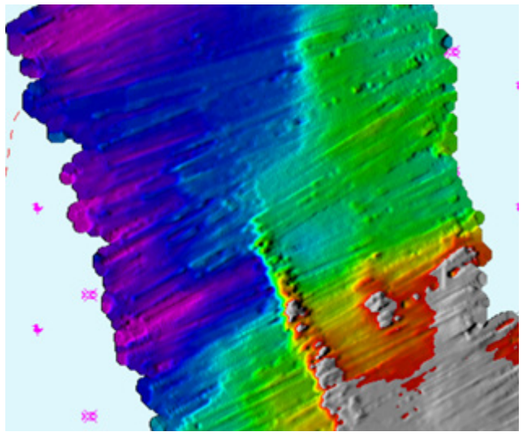
» Small objects on a changeable seafloor may be missed

» Objects during high mapping speeds may be missed

Example; OFF



Example; ON



6. SEAFLOOR: TRACKING

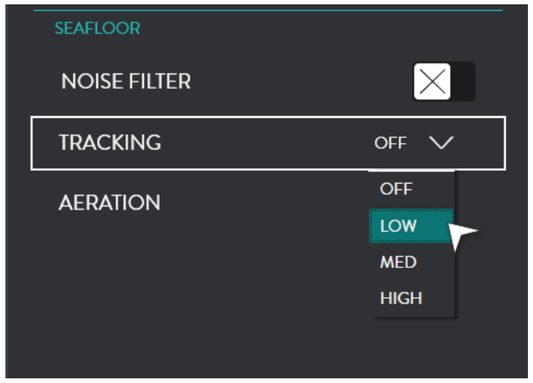
Applies to Bathymetry charting data.

Purpose;

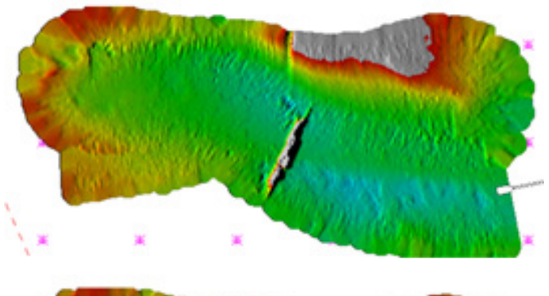
To prevent seafloor tracking artifacts such as fish schools and interfering sources such as sounders.

Disadvantages;

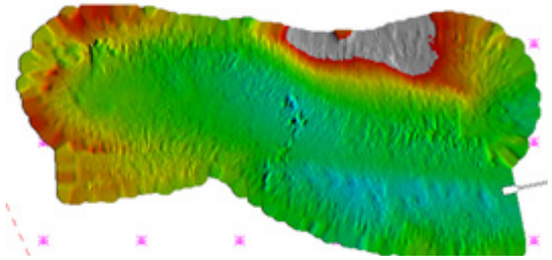
» A very changeable seafloor may not be tracked effectively
» Tracking while traveling at higher speeds may be compromised



Example; OFF



Example; HIGH



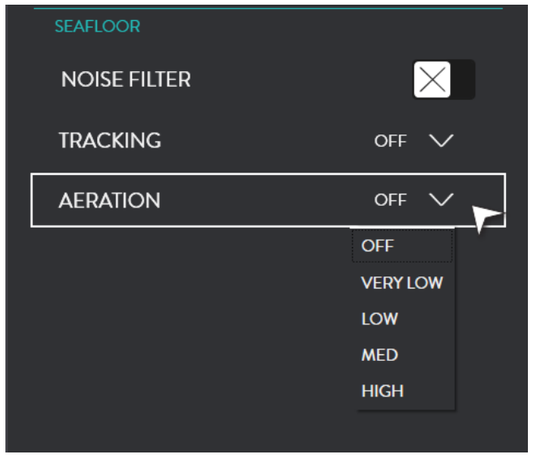
7. SEAFLOOR: AERATION

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.

Purpose;

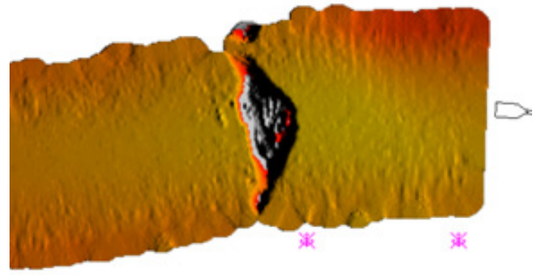
To prevent aeration and other anomalies causing discontinuity in return signal strength from introducing poor seafloor tracking.



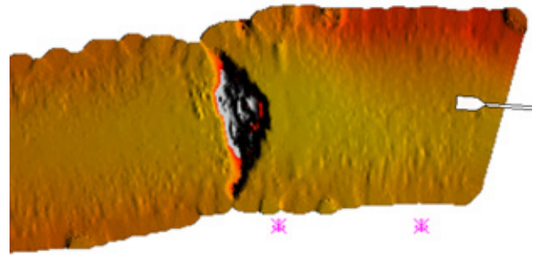
Disadvantages;

» 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

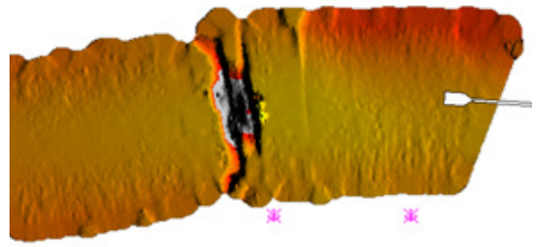
Example; OFF



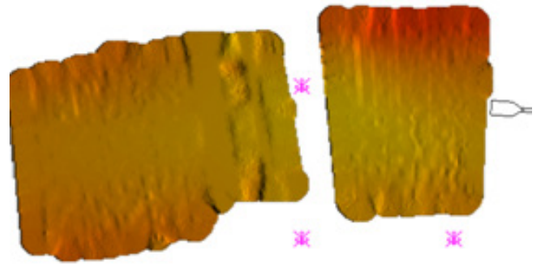
Example; LOW



Example; MEDIUM



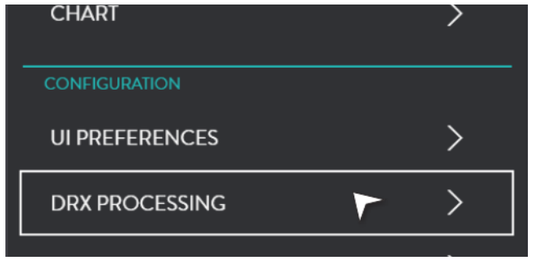
Example; HIGH



3.2.5. 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.

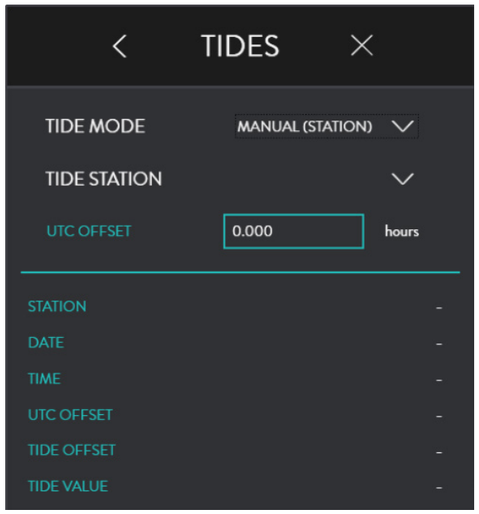
1. From the HOME bar, under CONFIGURATION select DRX PROCESSING.



2. Select TIDES

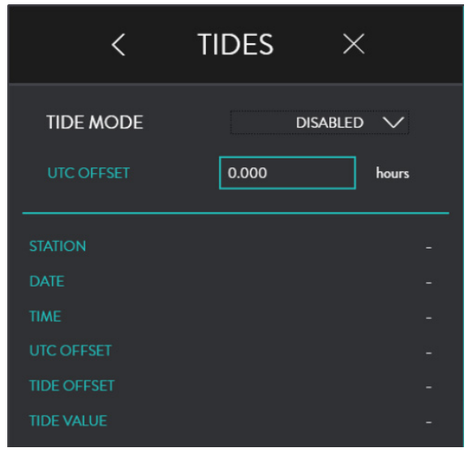
TIDE MODE will provide you with the following options: DISABLED, AUTO, MANUAL (STATION) or MANUAL (OFFSET).

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



3.2.5.3. Tide Mode Disabled

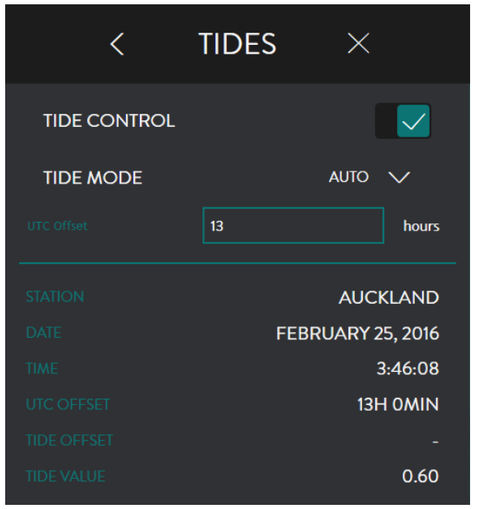
No tidal offset will be applied as a correction to seafloor data in the DRX.



3.2.5.4. Tide Mode 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 entered to apply correct local time for the tide station.



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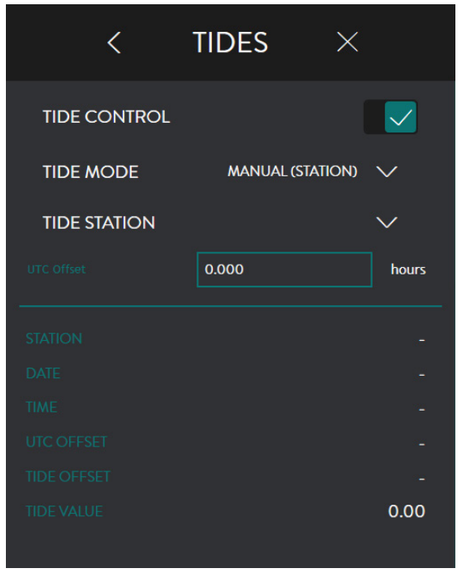
3.2.5.5. Tide Mode Manual (Station)

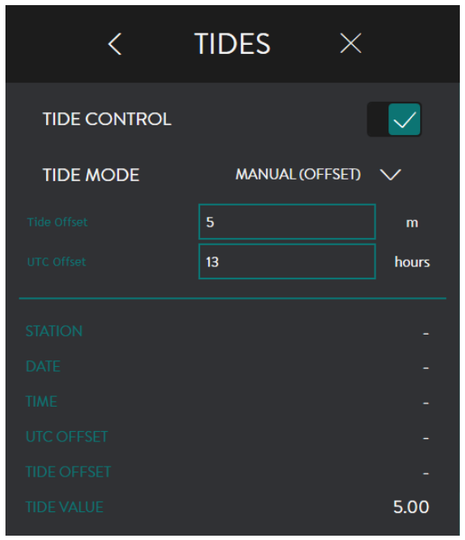
Tidal offset will be applied based on a manually selected tide station. The value will be applied to the DRX periodically.

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



3.2.5.6. Tide Mode Manual (Offset)

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



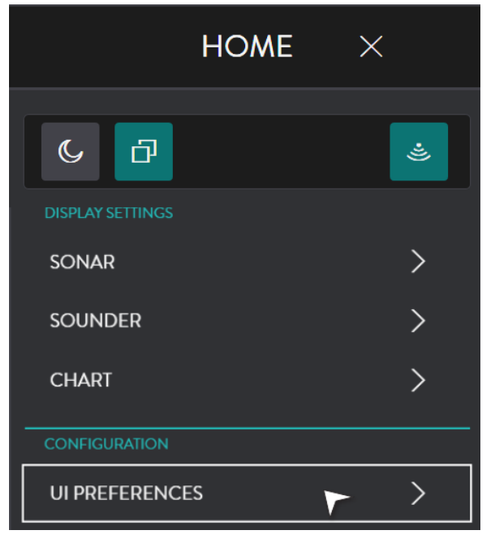
NOTE: TIDE VALUE will give the tide value currently being applied to the DRX.

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

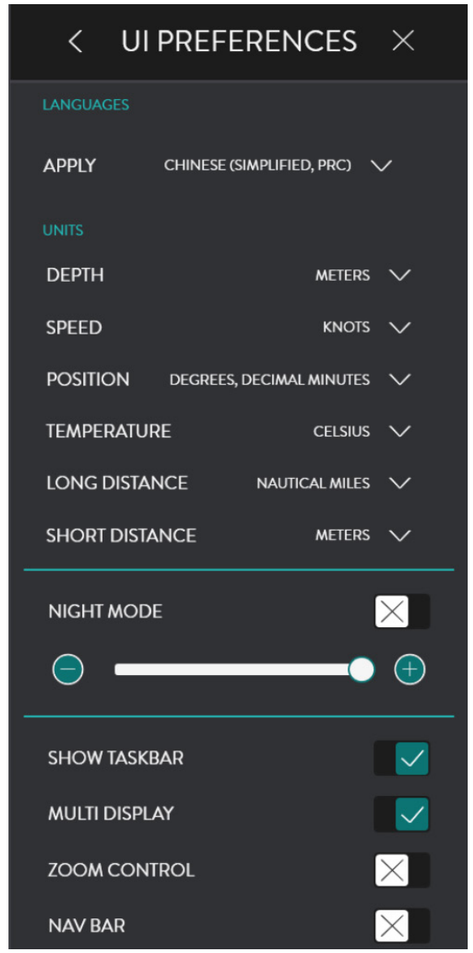
3.3. UI PREFERENCES

This provides WASSP CDX user preference options.

From the HOME bar, under CONFIGURATION select UI PREFERENCES.



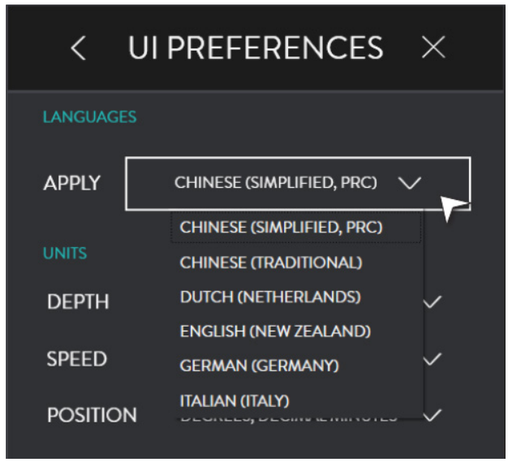
This provides the following unit preference options:



3.3.1. Languages

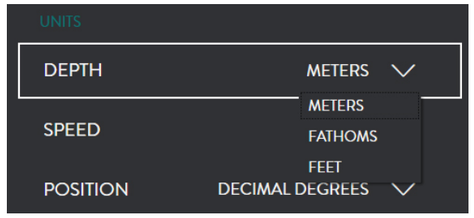
This provides language options.

Hit APPLY for the language to be applied.



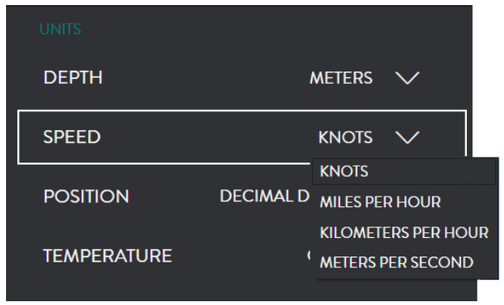
3.3.2. Depth

This will provide depth options in METERS, FATHOMS or FEET.



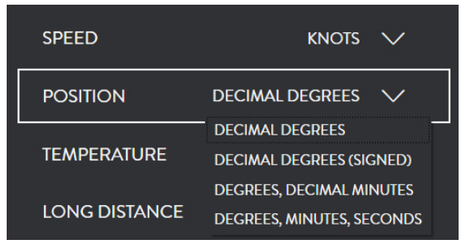
3.3.3. Speed

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



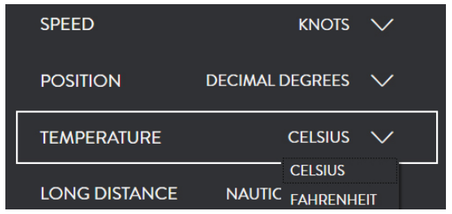
3.3.4. Position

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



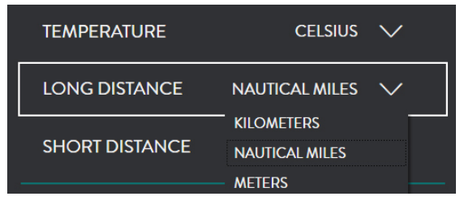
3.3.5. Temperature

This will provide temperature options in CELSIUS or FAHRENHEIT.



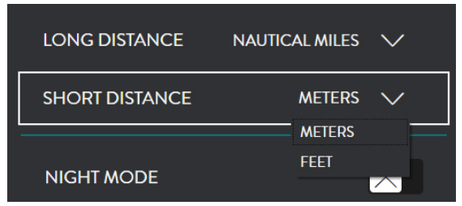
3.3.6. Long Distance

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



3.3.7. Short Distance

This will provide distant options in METERS or FEET.



3.3.8. Night Mode

Tick the check box to enable NIGHT MODE.

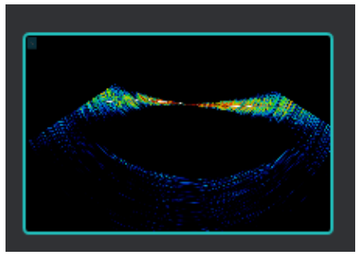
Use the slider control to adjust brightness level.

NOTE: Switching Night Mode on and off is available from the Home Menu Quick Access Bar.

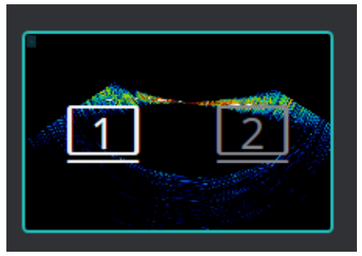
3.3.9. Multi Display

Enable this check box when using dual displays.

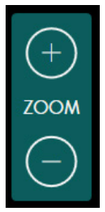
Below is an example of the Layout Option when Multidisplay is not enabled (see *"3.4. Layout" on page 31*).



Below is an example of the Layout Option when Multidisplay is enabled (see *"3.4. Layout" on page 31*).



3.3.10. Zoom Control

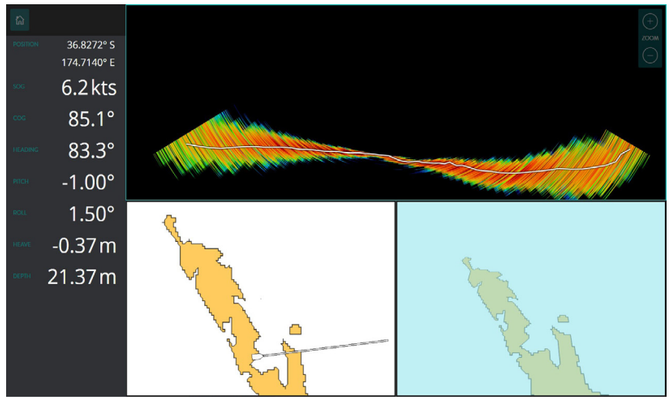


Tick the check box to enable the display ZOOM control. The zoom control tool will appear at the top right of the active panel and applies to this active panel.

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

3.3.11. Nav Bar

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



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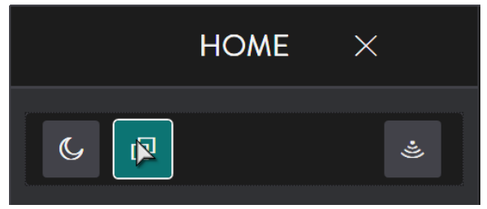
3.4. LAYOUT

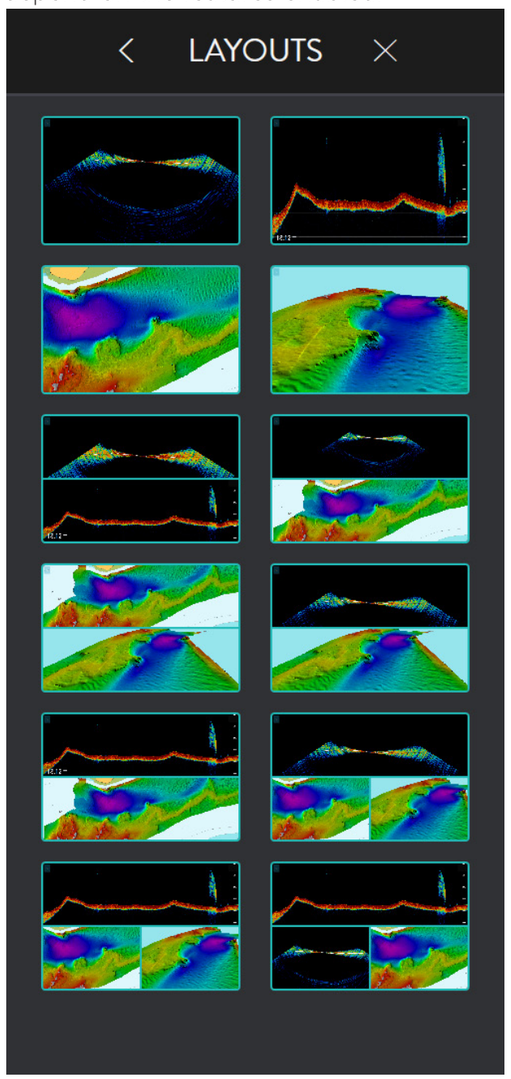
Panel layout can be configured using the LAYOUT section of the HOME bar.

From the HOME bar, select LAYOUTS.



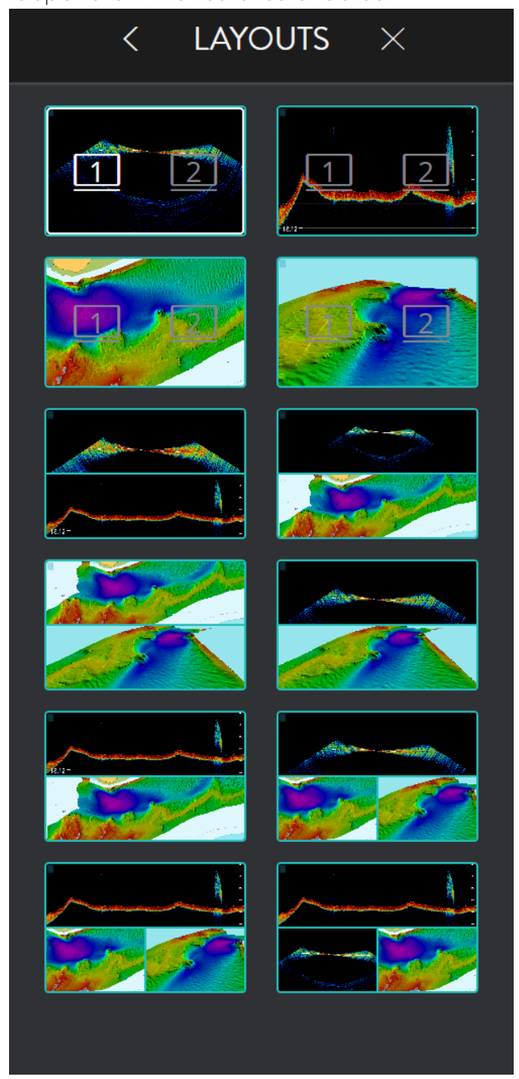
With MULTIDISPLAY disabled.

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



With MULTIDISPLAY enabled.

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



4 DISPLAY PANEL SETTINGS

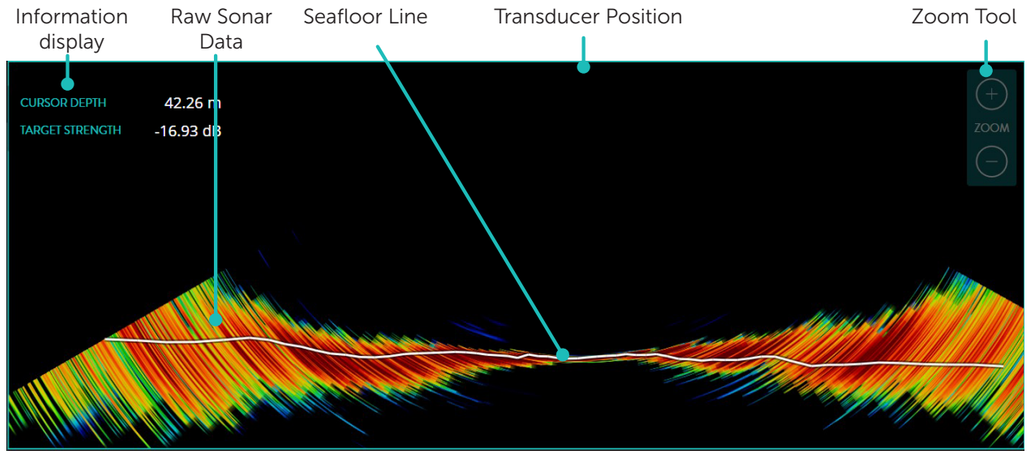
Display Panels are configured through the CSMs and/or DISPLAY SETTINGS configuration controls.

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

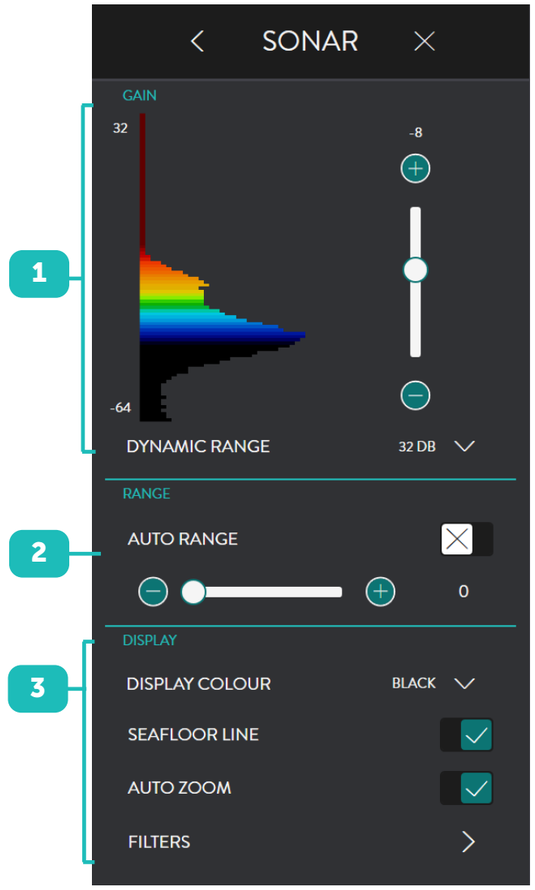
The Sonar Display Panel shows the water column and seafloor profile below the transducer.



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 35.* Manual zoom of displayed depth and range can be controlled using the mouse wheel or ZOOM tool. *See "3.3.10. Zoom Control" on page 30* 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 Configurations Options

From the HOME bar, under DISPLAY SETTINGS select SONAR when there is a Sonar Display Panel. This provides the following options:



1	GAIN	GAIN, DYNAMIC RANGE and DISPLAY COLOUR are used to optimize the sonar display to the user preference. *See "4.1.1.1. Gain" on page 34.*
2	RANGE	DRX control for setting ping / transmit range for the system. *See "4.1.1.2. Range" on page 35.*
3	DISPLAY	Controls for display settings. *See "4.1.1.3. Display" on page 35.* DISPLAY COLOUR allows colour palette selection. SEAFLOOR LINE allows seafloor line to be overlaid on the sonar data. AUTO ZOOM allows the display to be auto zoomed to fit the Display Panel or user controlled display zoom. 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 "3.2.4. Filter Setup" on page 18.*

4.1.1.1. Gain

GAIN, DYNAMIC RANGE and DISPLAY COLOUR are used to optimize 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 and the gain level to view within the available dynamic range.

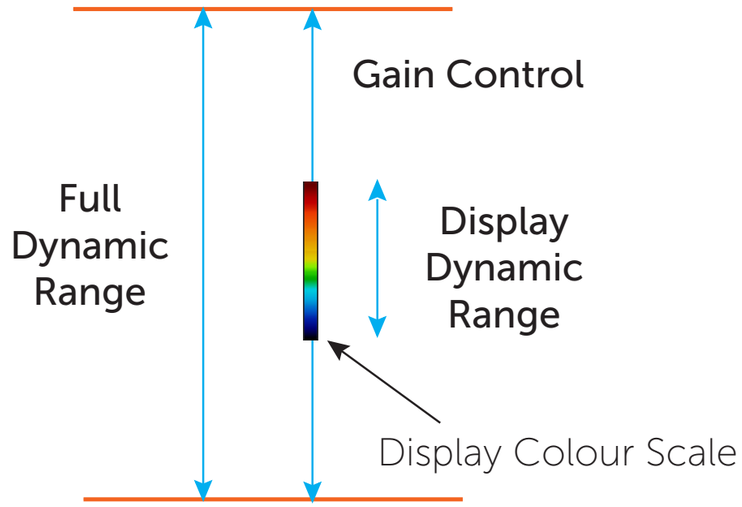
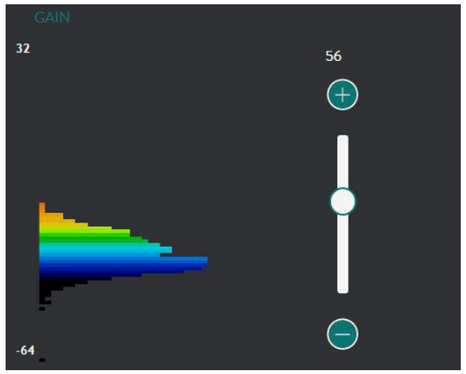


Figure 4. Sonar Gain and Dynamic Range Control

Gain

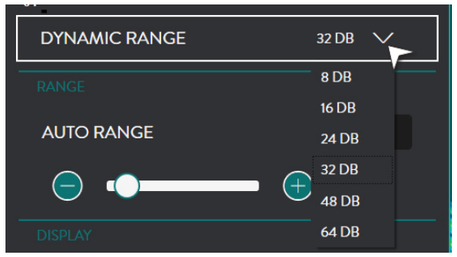
The gain level can be adjusted using the slider bar.

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



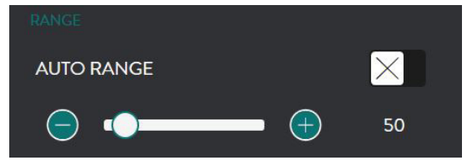
Dynamic Range

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



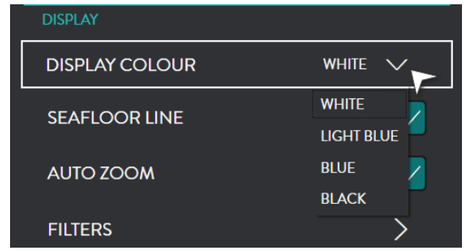
4.1.1.2. Range

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.

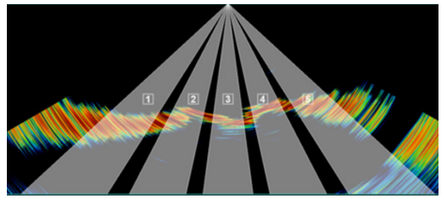
AUTO ZOOM allows the display to be auto zoomed to optimum depth to show the seafloor and water column.

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 "3.2.4. Filter Setup" on page 18

4.1.2. Sonar CSM

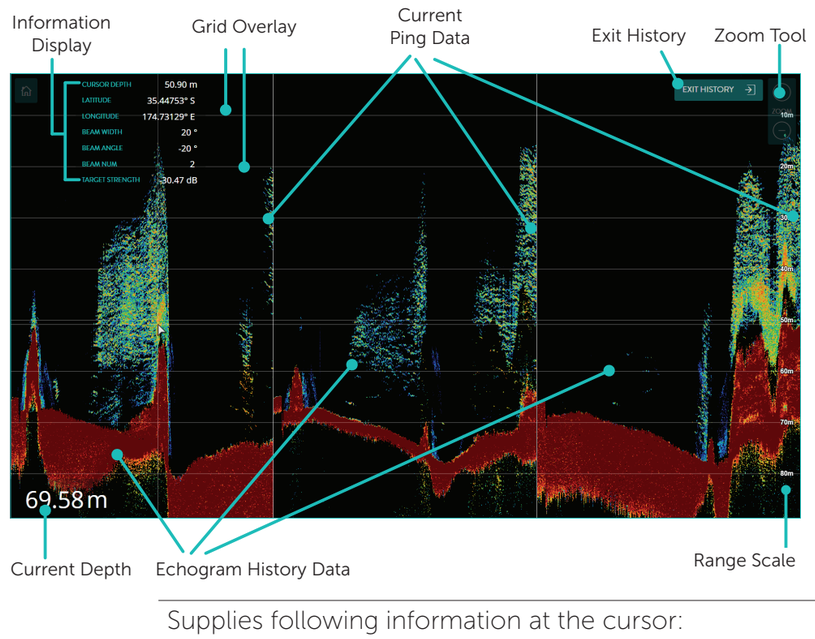
Accessed by right-clicking in the Sonar Display Panel.

SEAFLOOR LINE	Allows seafloor line to be overlaid on the sonar data.
AUTO ZOOM	Allows the display to be auto zoomed to fit the Display Panel or user controlled display zoom.
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. Sounder Options" on page 41.* 
SETTINGS	This option will display the SONAR Menu. *See "4.1. Sonar" on page 32.*

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.

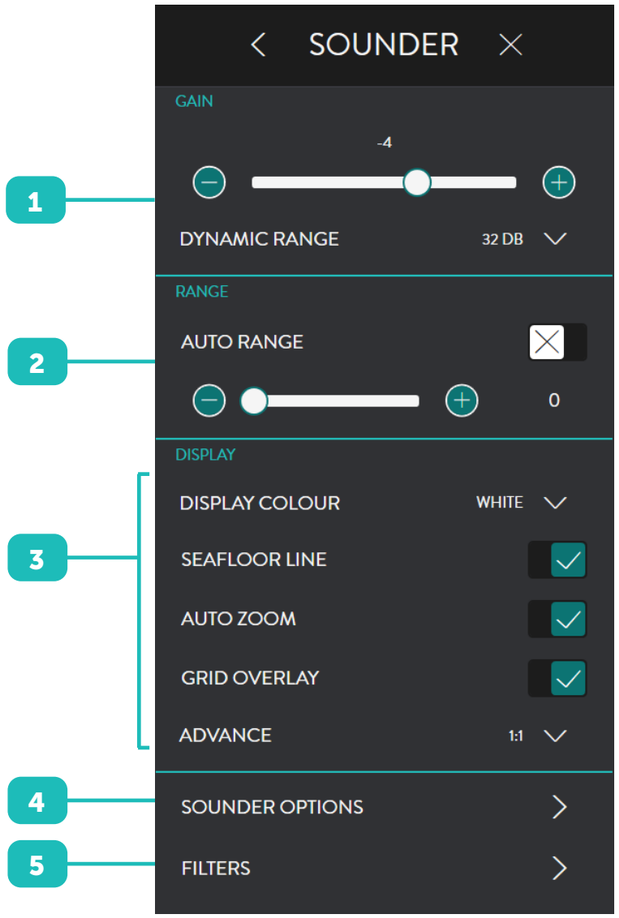


INFORMATION DISPLAY	Supplies following information at the cursor: » Position and depth » Beam details » Target Strength
ZOOM & PAN CONTROL	The sounder panel can be zoomed in and out. AUTO ZOOM allows the display to be auto zoomed to optimum depth to show the seafloor and water column. AUTO ZOOM can be enabled from the CSM. *See "4.2.1.2. Display" on page 40.* Manual zoom of displayed depth and range can be controlled using the mouse wheel or ZOOM tool. *See "3.3.10. Zoom Control" on page 30* 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:



1	GAIN	GAIN and DYNAMIC RANGE and DISPLAY COLOUR are used to optimize the Sounder display to the user preference. *See "4.2.1.1. Gain" on page 39.*
2	RANGE	DRX control for setting ping / transmit range for the system. *See "4.1.1.2. Range" on page 35.*
3	DISPLAY	Controls for display settings. *See "4.2.1.2. Display" on page 40.* DISPLAY COLOUR allows colour palette selection. SEAFLOOR LINE allows seafloor line to be overlaid on the sonar data. AUTO ZOOM allows the display to be auto zoomed to fit the Display Panel or user controlled display zoom. GRID OVERLAY overlays a grid on the Echogram display. ADVANCE option allows for advancing the Echogram scroll at the required rate.
4	SOUNDER OPTIONS	Allows independent configuration of each sounder beam. *See "4.2.1.3. Sounder Options" on page 41.*
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 "3.2.4. Filter Setup" on page 18.*

4.2.1.1. Gain

GAIN, DYNAMIC RANGE and DISPLAY COLOUR are used to optimize 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 and the gain level to view within the available dynamic range.

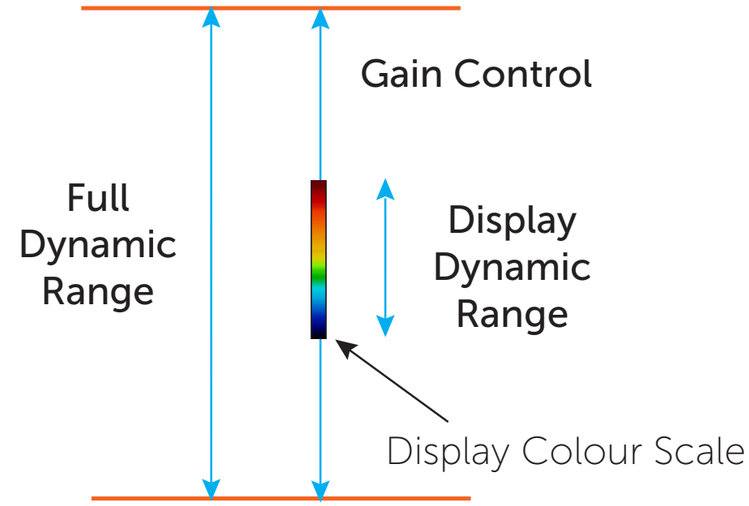


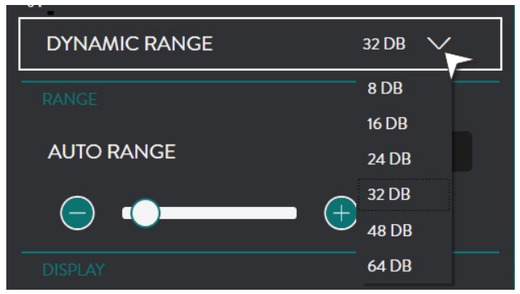
Figure 5. Sounder Gain and Dynamic Range Control

Gain

The gain level can be adjusted using the slider bar.

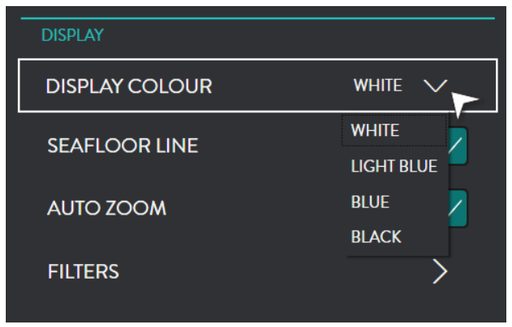
Dynamic Range

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.

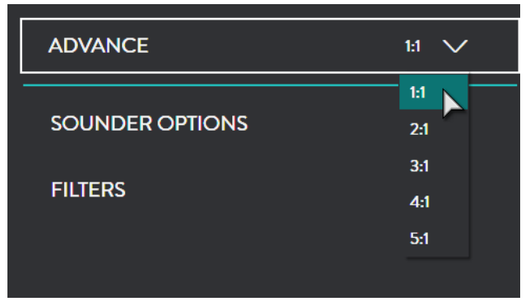


SEAFLOOR LINE displays the seafloor line when enabled.

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

GRID OVERLAY overlays a grid on the Echogram display.

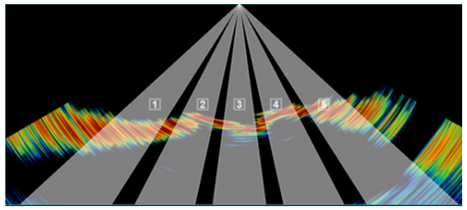
ADVANCE option allows for advancing the Echogram scroll at the required rate.

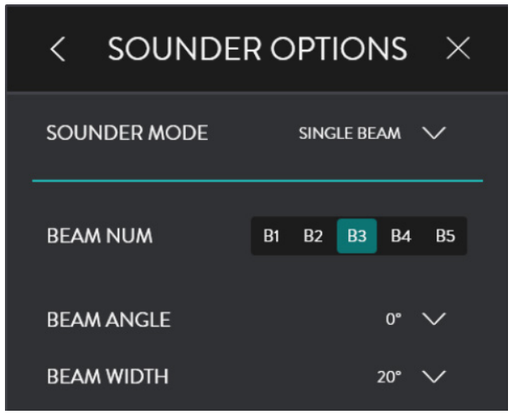


4.2.1.3. Sounder Options

SOUNDER OPTIONS 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.



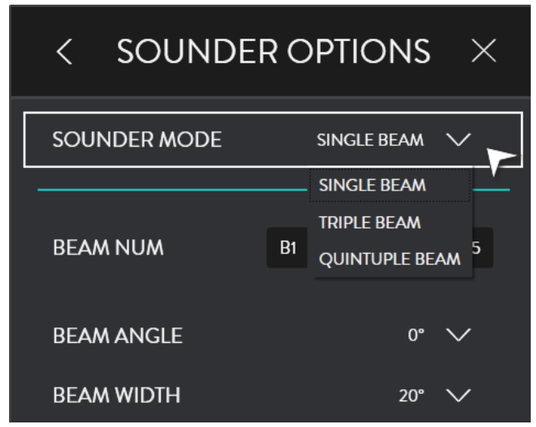


The SOUNDER MODE is used to display 1, SINGLE BEAM, 3, TRIPLE BEAM, or 5 QUINT BEAM, beams in the sounder Display Panel.

SINGLE BEAM will just display beam B3

TRIPLE BEAM will display beams B2, B3 and B4

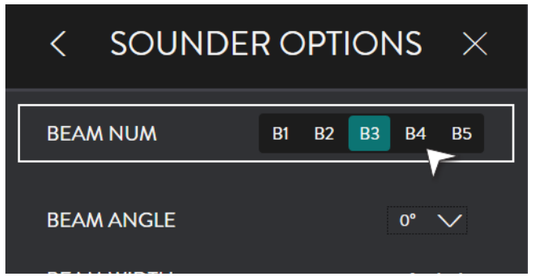
QUINT BEAM will display beams B1, B2, B3, B4 and B5



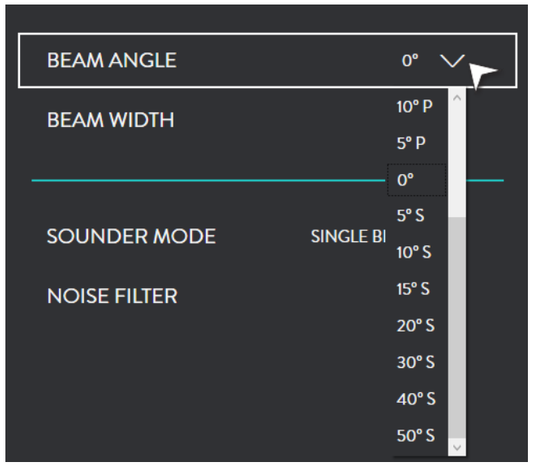
Individual beam configuration is carried out through the beam selection. Each beam can be configured independently if default operations need to be changed.

1. Select the beam to configure from the BEAM NUM options.

The option to the right shows BEAM 3 selected (Beam 3 is typically the Nadir beam).

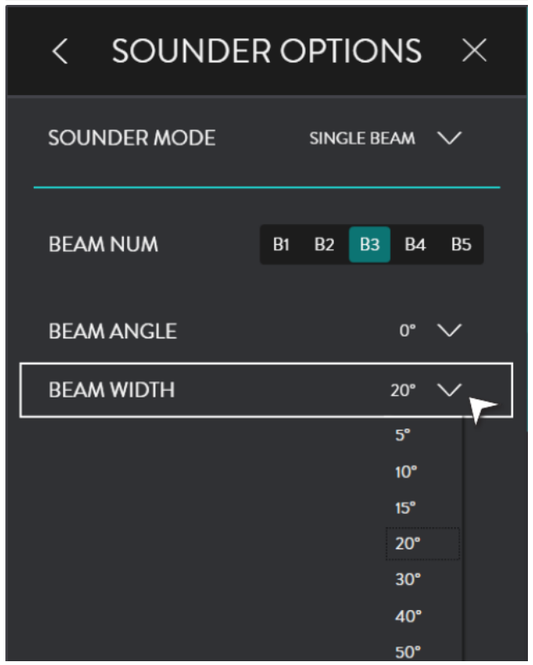


2. For the selected beam set the angle off of Nadir from the BEAM ANGLE options.



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

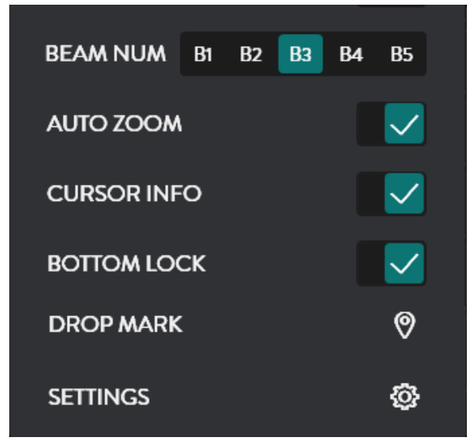
3. For the selected beam set the width from the BEAM WIDTH options.



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

4.2.2. Sounder CSM

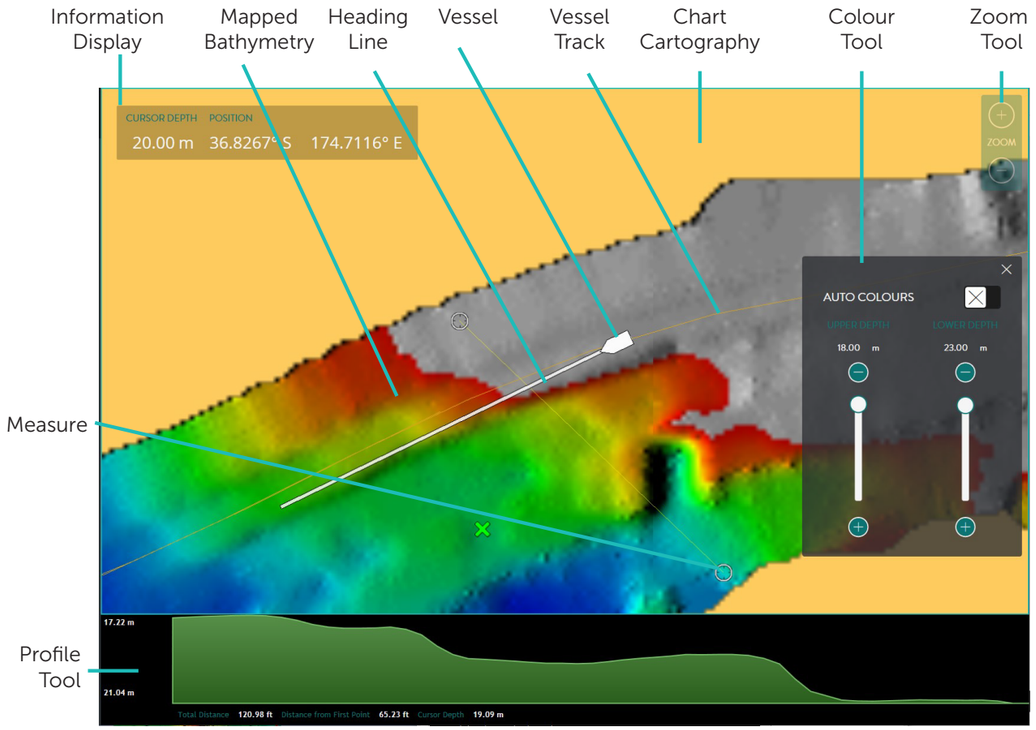
Accessed by right-clicking in the Sounder Display Panel.



BEAM NUM	Allows selection of an individual beam. Control is available when SOUNDER MODE is SINGLE BEAM and allows any beam to be selected for display.
AUTO ZOOM	Allows the display to be auto zoomed to fit the Display Panel or user controlled display zoom.
CURSOR INFO	Displays the Information display as an overlay on the Display Panel.
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.
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 57.*.
SETTINGS	This option will display the SOUNDER Menu. *See "4.2. Sounder" on page 37.*

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 "3.3.10. Zoom Control" on page 30*. 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:

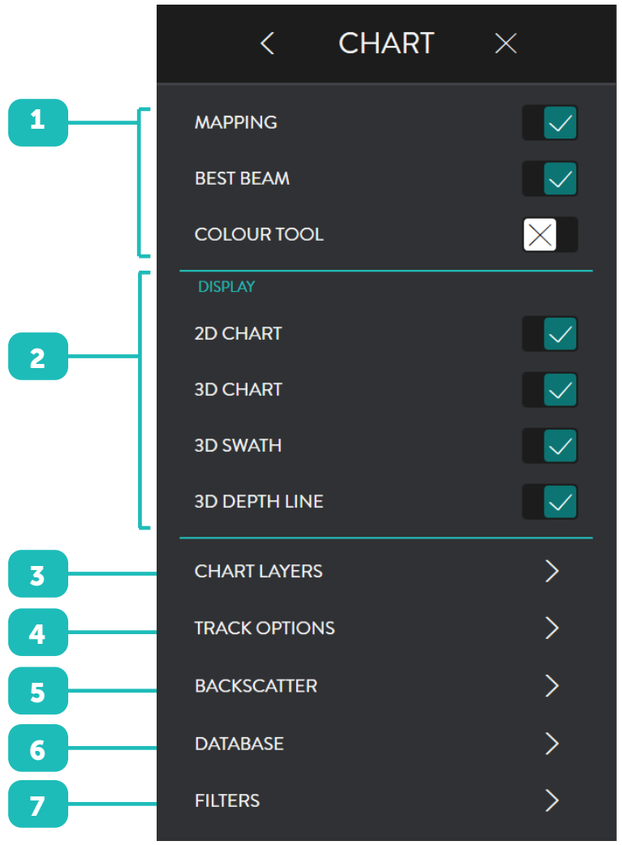
» Navionics Gold/Navionics+
» Navionics Platinum

Navionics charting on SD card will be automatically detected and loaded into WASSP CDX.

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.

4.3.2. Chart Configuration Options

From the HOME bar, select CHART when there is a 2D or 3D Display Panel. This provides the following options:



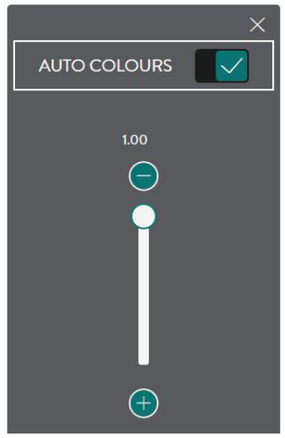
1	CHART	Controls for mapping options » MAPPING: To enable or disable Bathymetry being saved to the database and displayed on the chart » BEST BEAM: To optimise overlapping Bathymetry selection » COLOUR TOOL: Used to select Bathymetry colour display. *See "4.3.2.1. Colour Tool" on page 46.*
2	DISPLAY	Display options on the chart » 2D CHART: Enable/disable display of the chart cartography » 3D CHART: Enable/disable display of the cartography » 3D SWATH: Enable/disable the vessel swath display » 3D DEPTH LINE: Enable/disable the vessel depth line display
3	CHART LAYERS	Used to enable or disable specific chart layers. *See "4.3.2.2. Chart Layers" on page 47.*
4	TRACK OPTIONS	Used to set up vessel track on the 2D Chart. *See "4.3.2.3. Track Options" on page 48.*
5	BACK SCATTER	Used to access the Backscatter setup and configuration options for overlay on the chart. *See "4.3.2.4. Backscatter" on page 48.*
6	DATABASE	Used to set up the Mapping Database. *See "4.3.3. Database" on page 46.*
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 "3.2.4. Filter Setup" on page 18.*

4.3.2.1. Colour Tool

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

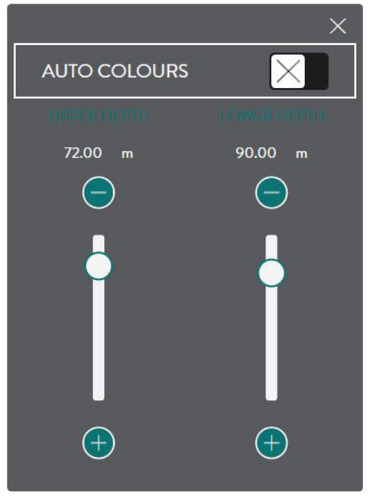
With AUTO COLOURS enabled the colour range will be assigned automatically, centered around the current depth at the vessel.

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.



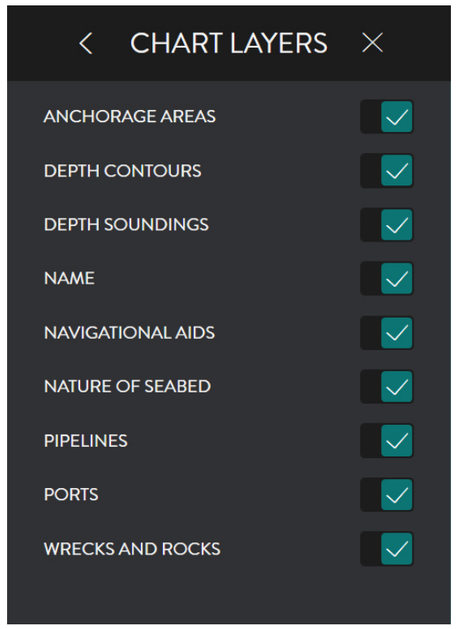
With AUTO COLOURS disabled the colour range will be controlled by the user.

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

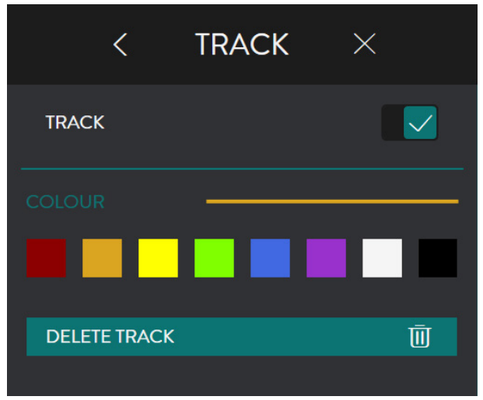


4.3.2.2. Chart Layers

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



4.3.2.3. Track Options



By selecting TRACK, the following options are available:

TRACK enables or disables display of the track on the 2D Chart display.

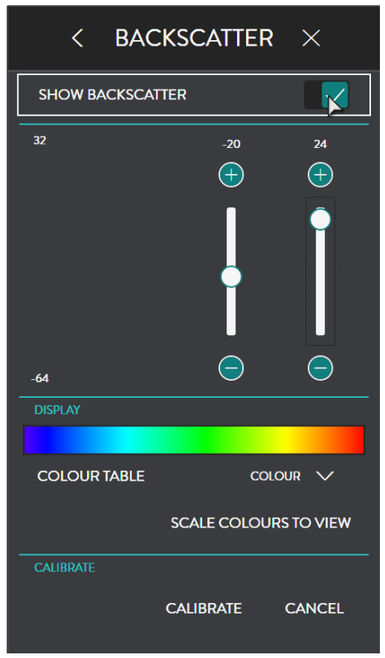
COLOUR allows track colour selection.

DELETE TRACK will permanently delete the track.

4.3.2.4. Backscatter

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

For optimum performance the backscatter calibration routine should be run to compensate for system characteristics.



SHOW BACKSCATTER shows the backscatter overlay on the chart.

Backscatter will show instead of Bathymetry when enabled.

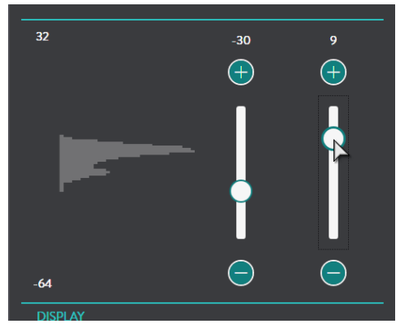
Backscatter overlay displays seafloor reflectivity, represented by colour change.

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

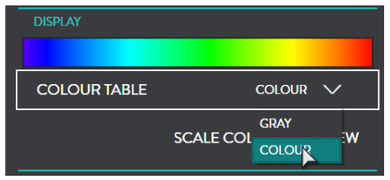
The backscatter control allows setting the backscatter colour range.

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

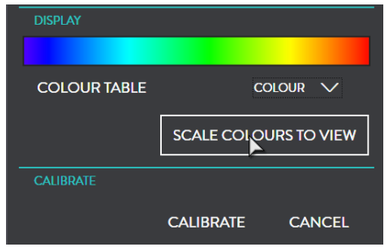
The histogram alongside the colour range controls indicates the actual spread of backscatter intensity currently displayed in the panel.



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.

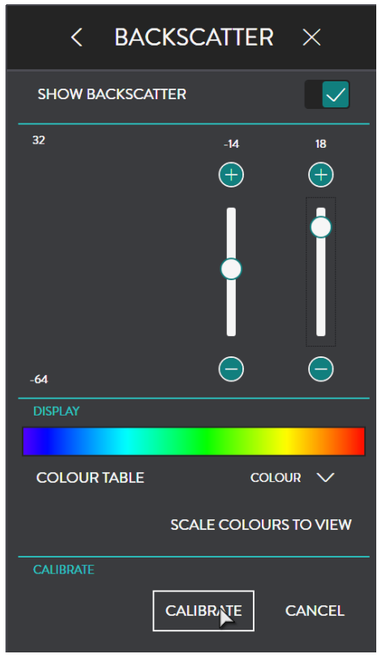


CALIBRATE : Backscatter calibration is run to compensate for system characteristics that may cause artefacts on the backscatter display. Specifically this compensates for the transducer beam pattern variance from the nominal. Calibration requires:

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

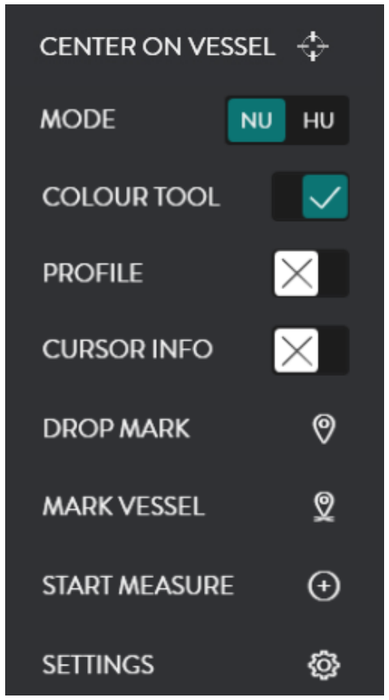
To run the Backscatter calibration:

1. Enable SHOW BACKSCATTER.
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.
5. Pressing cancel at any point during the calibration run will stop the data collection process and disregard the data.



4.3.3. 2D Chart CSM

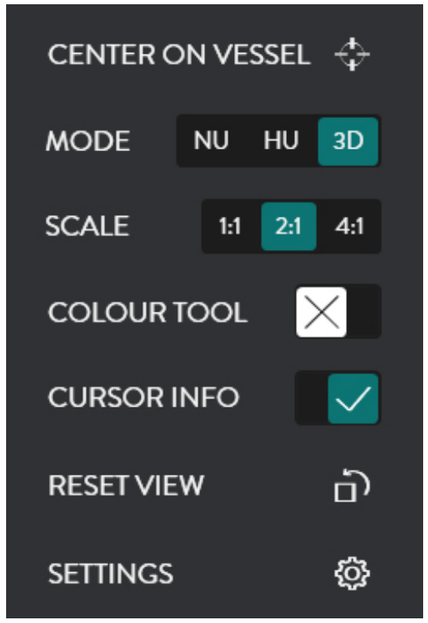
To access the 2D CSM, right-click on the Display Panel:



CENTER ON VESSEL	Centers the chart on the vessel position. This mode will be disabled if the chart is panned.
MODE	Toggles between NU (North Up) and HU (Head Up) chart display.
COLOUR TOOL	Displays the COLOUR TOOL. *See "4.3.2.1. Colour Tool" on page 46*.
SHOW PROFILE	Enables the Profile tool. *See "5.2. Profile Tool" on page 58.*
CURSOR INFO	Displays the Information display as an overlay on the Display Panel.
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. *See "5.1. Marks" on page 57*.
MARK VESSEL	Places a mark at the vessel position.
START MEASURE	Starts / Stops the Measure on the PROFILE tool. *See "5.2. Profile Tool" on page 58.*
SETTINGS	This option will display the CHART Menu. *See "4.3.1. Chart Configuration Options" on page 46*.

4.3.4. 3D Chart CSM

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



CENTER ON VESSEL	Centers the chart on the vessel position.
MODE	Toggles between NU (North Up), HU (Head Up) and FREE ROTATE which allows user orientation of Vessel and chart; left-click the sursor 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 "4.3.2.1. Colour Tool" on page 46*.
CURSOR INFO	Displays the Information display as an overlay on the Display Panel.
RESET VIEW	This will reset view to its native resolution.
SETTINGS	This option will display the CHART Menu. *See "4.3. Chart" on page 44*.

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.

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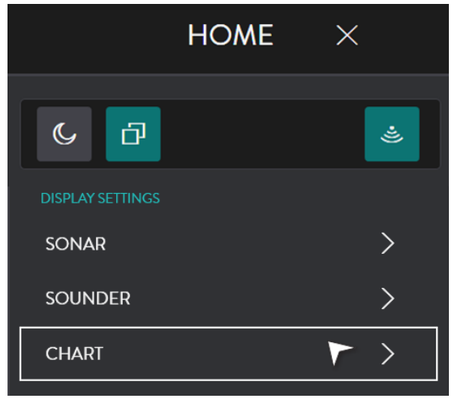
4.3.5. Database

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

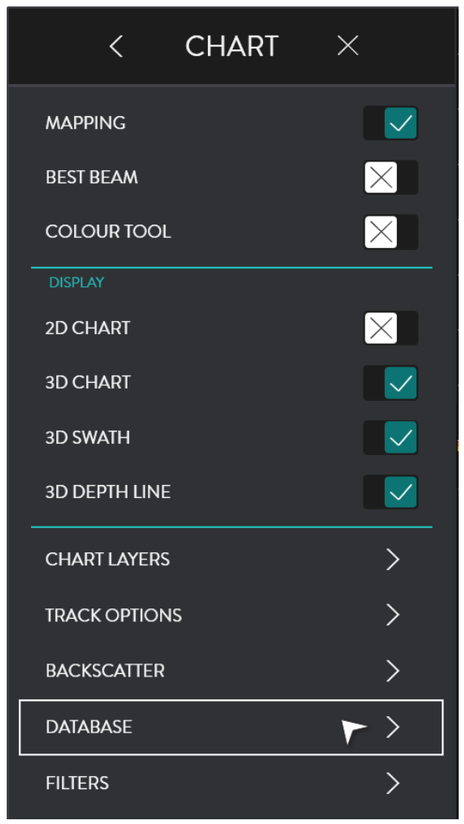
DATABASE is used to set up the Mapping Database. Bathymetric data from the DRX will be saved to the database you select.

4.3.5.1. To create a Database

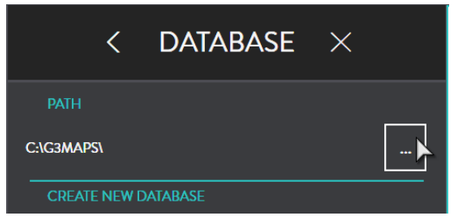
1. From the HOME bar, under DISPLAY SETTINGS, select CHART.



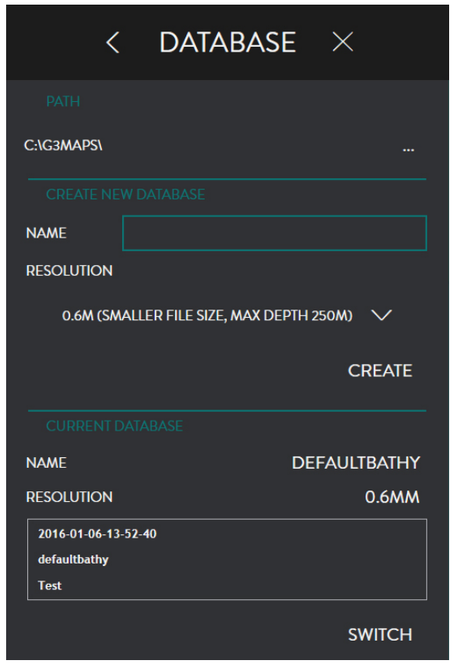
2. Select DATABASE.



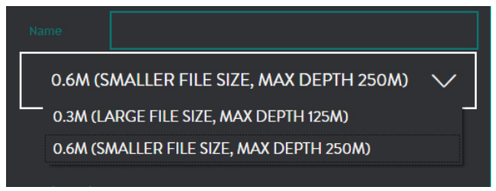
3. Under the PATH, click on the dots.
4. This will open a BROWSE FOR FOLDER window. Select the folder where the database is to be stored.



5. Type in a name for the database.



6. Select high resolution 0.3M option or low resolution 0.6M option.
7. Click CREATE.

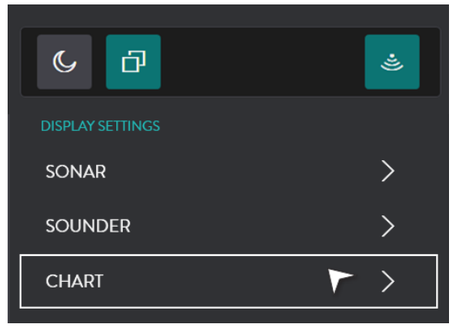


NOTE: There will be no mapping recorded beyond the max depth stated in the dropdown.

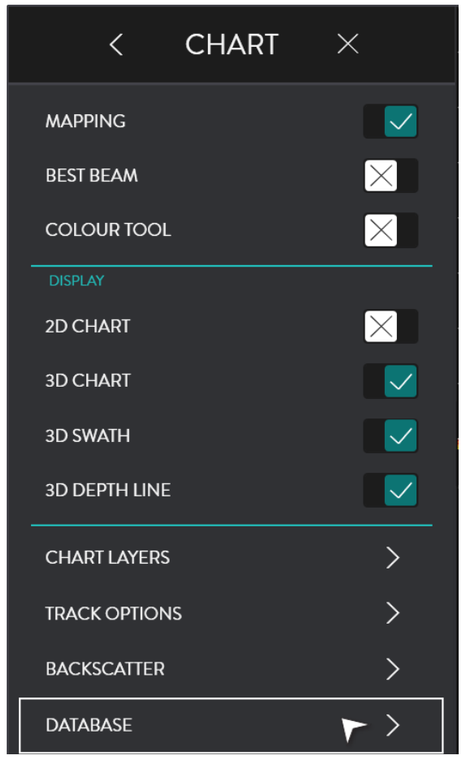
4.3.5.2. To Select a Database

Bathymetric data will be recorded to the currently selected database.

4. From the HOME bar, under DISPLAY SETTINGS, select CHART.

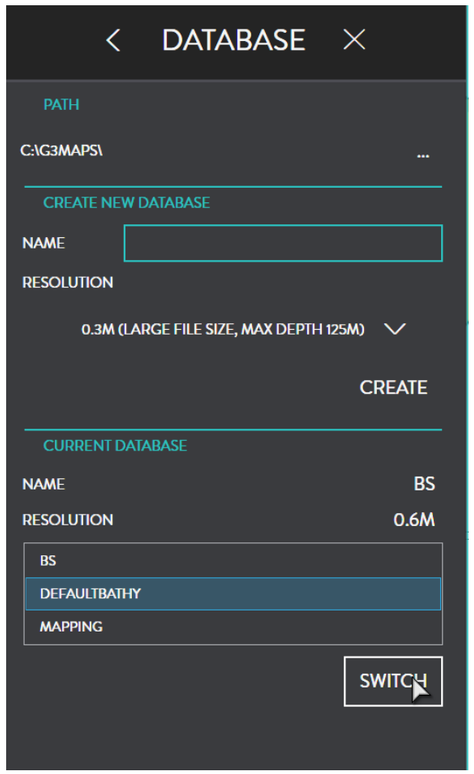


5. Select DATABASE.



6. The user can switch to use a different database using the SWITCH button. All databases under the currently selected PATH will be available to select. *See "4.3.3. Database" on page 46.*

7. Select appropriate database. CURRENT DATABASE will indicate the currently selected database name and storage resolution



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

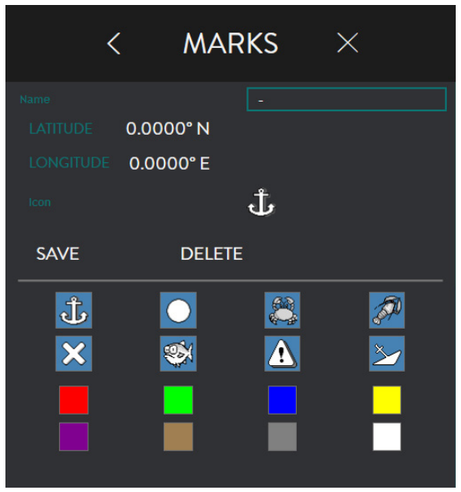
5 TOOLS

5.1. MARKS

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

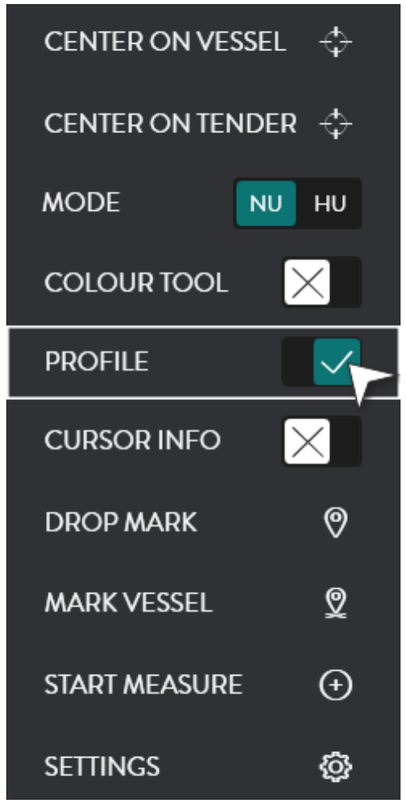


There are colour options for each mark. To change colour, click on the colour box you require e.g. yellow:

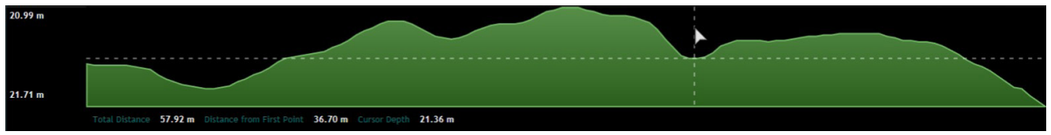
5.2. PROFILE TOOL

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

To enable or disable display of the profile tool click on PROFILE option in the appropriate CSM.

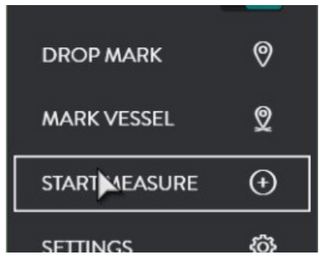


PROFILE TOOL will be displayed. Mousing over the Profile Tool will display depth and distances.

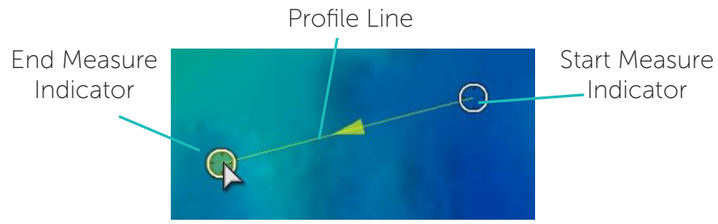


To select the measure area that will be profiled:

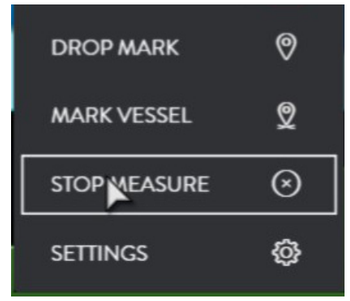
1. Select START MEASURE from the CSM.



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 profile 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 TOOLS AND UTILITIES

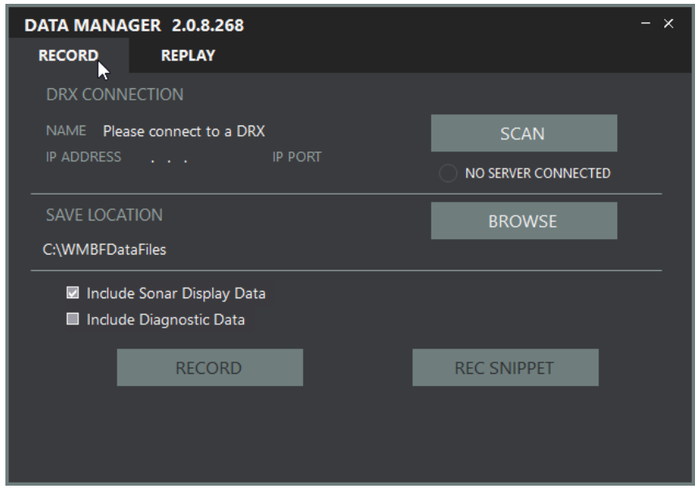
6.1. DATA MANAGER

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.

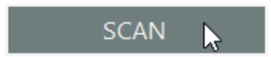
DATA MANAGER is installed with CDX but is launched as an independent application.

6.1.1. Data Manager Record

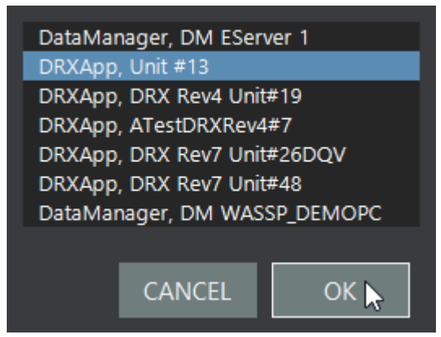
1. Click on the RECORD tab.



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.



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

6. Click on RECORD to start recording and STOP to stop recording.

7. When recording there are some options:

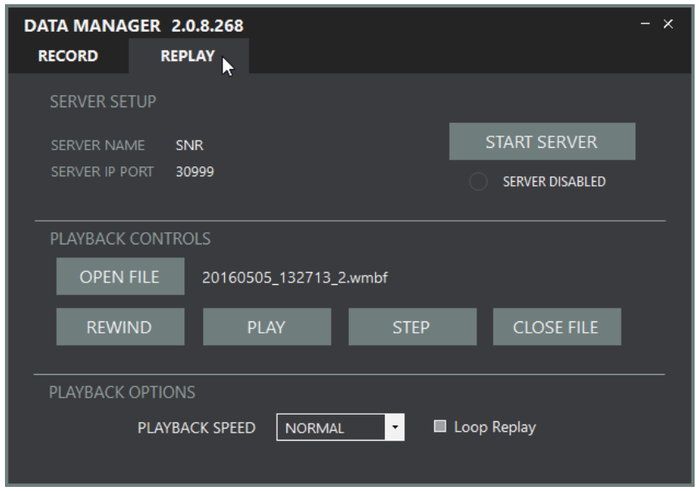
» 'Include Sonar Display Data' will record Sonar data as well as bathymetric data. This will result in medium size files.

» '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

1. Click on the REPLAY tab.



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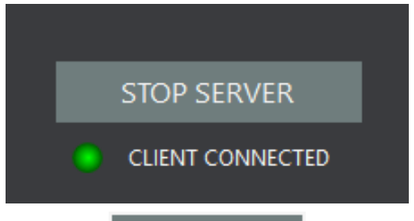
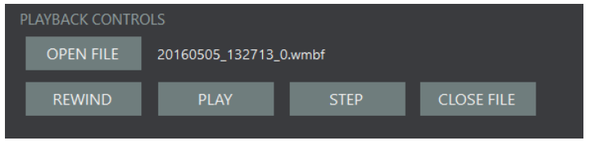
2. Click on START SERVER. This allows Data Manager to be available to client applications such as CDX.
3. Once a client application is successfully connected the connection icon will display green.
4. A playback file can be selected using the OPEN FILE button.
5. PLAYBACK CONTROLS can then be used to 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 10.

7 APPENDIX

APPENDIX A - PC SPEC

		MINIMUM	RECOMMENDED
OS		Windows 7, 8.1, 10	Windows 8.1, 10
CPU	*Base Frequency*	2GHz	2GHz
	Cores/Threads	2/4	4/4
Memory		4GB	8GB
Graphics		DirectX 11	DirectX 11
Screen Resolution		1024x768	FHD - 1920x1080
HDD/SDD		250GB	2TB
Network	*Ethernet*	GbE	GbE
	Wi-Fi	802.11ac	802.11ac

Example of WASSP supported PCs:

» Low end PCs
- Intel NUC5i3RYK

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

» Ruggedised PCs
- ADLINK MXE-5400

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APPENDIX B - SIMPLIFIED WIRELESS CONFIGURATION

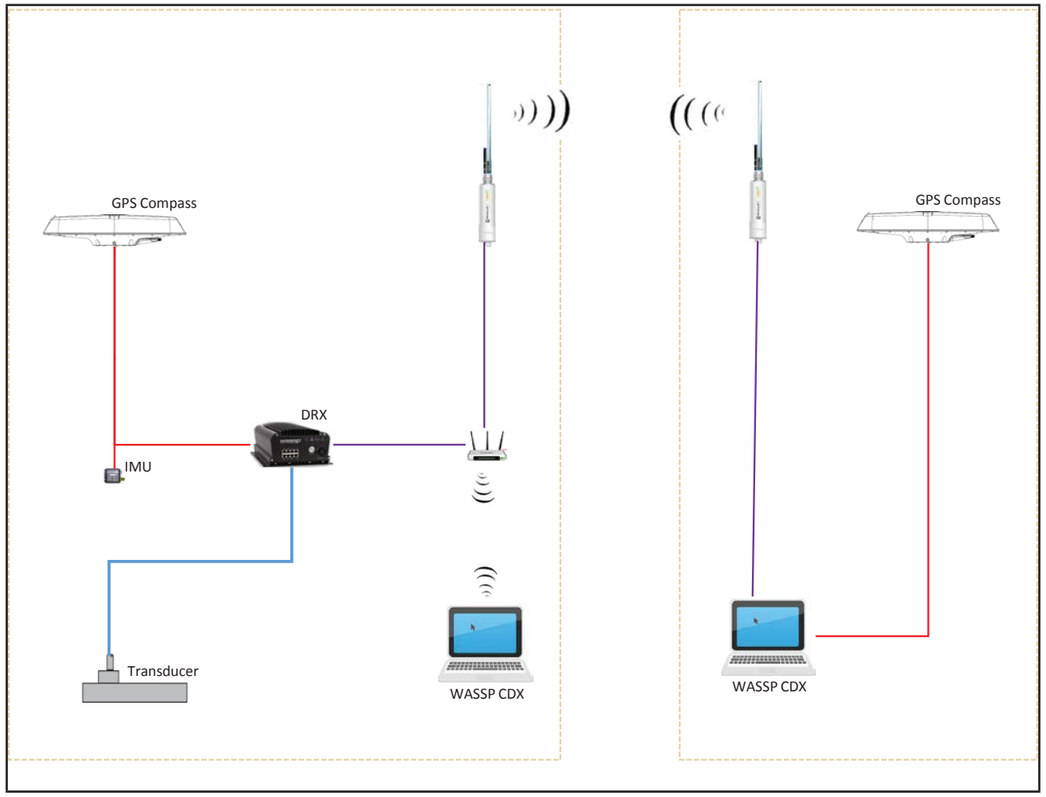

Figure 6. Simplified Wireless Configuration

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