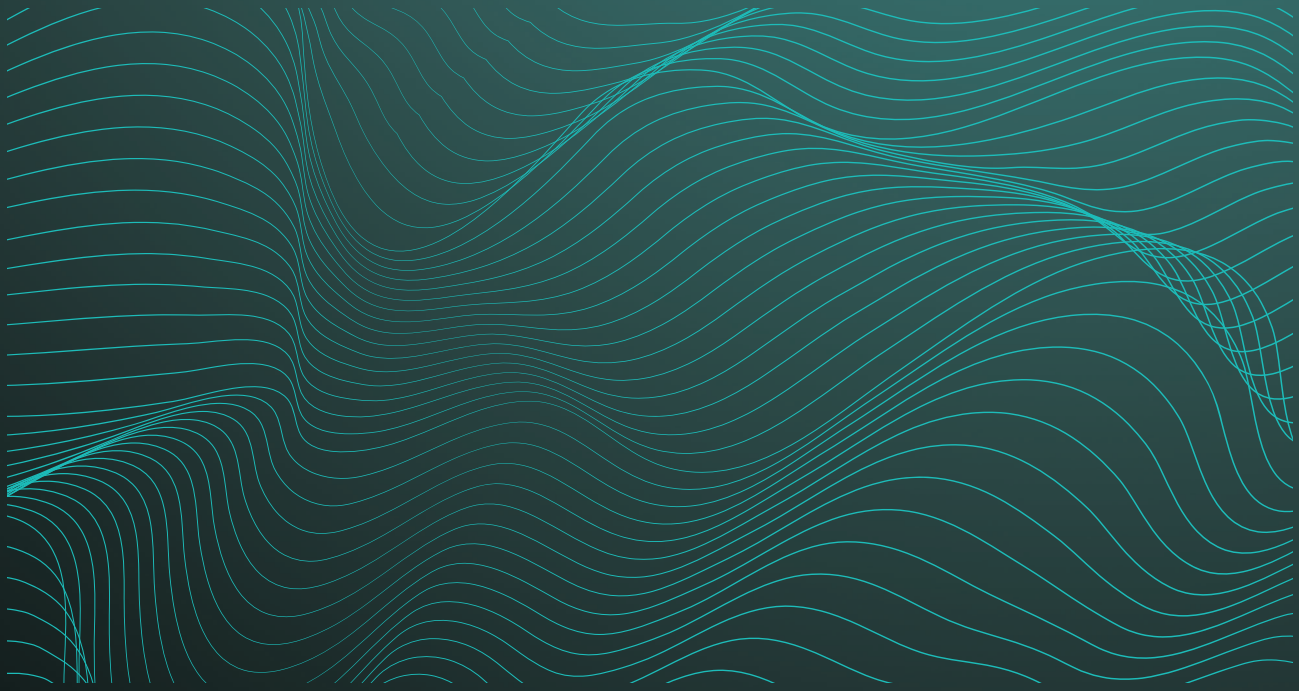
WASSP DRX INSTALLATION MANUAL
V 5.0



wassp® MULTIBEAM

SEE IT ALL

WASSP DRX INSTALLATION MANUAL

This installation manual covers the following:

» DRX installation, configuration and operation.
» Sensor configuration and commissioning.
» Control and Display Application interfacing.

This manual does not cover installation and setup of external sensors. Refer to installation and operation manuals for the specific sensors that are being used.

DRX Interconnect change history can be seen in *"Appendix F - DRX Interconnect change history" on page 87.*

DOCUMENT REVISION HISTORY

REVISION DATE	REASON FOR CHANGE	VERSION
March 2016	Compilation	1.0
June 2016	Corrected RS-422 pin-out	1.1
July 2016	Connector and Setup Webpages	2.0
November 2016	Various Notes	2.1
June 2017	Update DRX to new configuration	3.0
January 2018	Updates to Section 4 Operating the DRX and Section 5 Sensor Configuration	4.0
March 2018	Update to AUX connector configuration	4.1
April 2018	Update to DRX Interconnection	4.2
June 2018	Updates to support DRX-46	5.0

RELATED DOCUMENTS

» WASSP DRX Installation Manual – For the latest version of this manual go to wassp.com
» WASSP Transducer Installation Manual – Installation manual for specific transducers supported by DRX.
» WASSP CDX Operators Manual – User manual for the WASSP CDX application for control, visualisation and data post processing of DRX data.
» 3rd Party Application Manuals – 3rd Party Applications that interface with DRX
» Sensor Installation and Operation Manuals – Sensors supported by DRX.
» WASSP DRX ICD – Interface documentation for DRX and associated DRX SDK/API documentation.
» Sensor Box Installation Manual - Installation Manual for the WASSP Sensor package

Further documentation and updated specifications and DRX installation manual can be found at wassp.com

DRX INSTALLATION MANUAL

GENERAL NOTICES

WASSP Ltd. reserves the right to change the contents of this manual and any system specifications without notice.

Contact WASSP Ltd. regarding copying or reproducing this manual.

SAFETY NOTICES

The installer of the equipment is solely responsible for the correct installation of the equipment. WASSP Ltd. holds no responsibility for any damage associated with incorrect installation.

ELECTRICAL SAFETY

» Fire, electrical shock, or equipment damage may occur if the transceiver comes into contact with liquid.
» The DRX is rated for operation at 9-32 V DC or 18-32 V DC model dependent.
» Make sure that the power is switched OFF at the main supply (e.g. switchboard) **before** beginning the installation. Fire or electrical shock may occur if the power is left ON.
» Do not open or access equipment covers unless you have had DRX service training and are cognisant with the system's electrical circuits.
» Make sure all safety precautions for electrical equipment are taken when operating or servicing the equipment. These are to be carried out in accordance with local or national regulatory body safety regulations.
» Make sure that the DRX is secure and will not loosen due to the vessels vibration.

SUPPORT INFORMATION

For details on Registration, Support and Resources *see "Appendix E - Product Registration, Support and Resources" on page 89.*

WARNINGS, CAUTIONS AND NOTES

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

WARNING indicates that if the instruction is not heeded, the action may result in loss of life or serious injury.

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 can be helpful while performing a procedure.

DRX INSTALLATION MANUAL

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APPENDIX

DRX INSTALLATION MANUAL

FIGURES

1 INTRODUCTION

The WASSP DRX is a 'Black Box' smart transceiver that interfaces to devices and sensors to make up the WASSP Multibeam Sounder System.

The system can be configured to operate in various modes, typically using a wide-angle sonar transducer to profile the water column and seafloor in high resolution.

Using appropriate sensors, the DRX can be configured to be suitable for operations such as commercial fishing, sport fishing, survey and mapping, exploration, search and rescue and many more.

Actual data types output to client applications, such as WASSP CDX, will be determined by:

» Data types enabled in DRX, as determined by the licensing model.
» Data types the client application supports and queries for.
» If the client application is using raw, processed or post processed data .
» Data types that are supported will increase through continual product development and DRX upgrades.

The DRX functionality is defined by the software installed, the data types enabled, the transducer connected, and the physical DRX model. The physical DRX model is supported in 4 configurations:

» WSP-603-200; DRX-25 wideband model (no longer available).
» WSP-603-200; DRX-32 wideband model used with S3 and F3 products.
» WSP-603-205; DRX-32 wideband model with IP67 rating.
» WSP-603-250: DRX-46 wideband model used with F3X.

The same software package is applicable to all models.

For specification details on each model *see "9 Technical Specifications" on page 69*.

NOTE: DRX Serial numbers below #70 are model DRX-25.
DRX Serial numbers #70 and above are DRX-32.
DRX Serial numbers #10001 and above are DRX-46

1.1. MAIN FEATURES

The main features of DRX in a multibeam configuration will depend on the model as follows:

» Variable number of beams - Model and configuration dependent.
» 120° Swath coverage – Transducer dependent.
» Depth capability is configuration and environment dependent. Typical configurations:
  • DRX-25 with WMB160 transducer; 1 to 150m
  • DRX-32 with WMB160 transducer; 1 to 200m
  • DRX-46 with WMB160 transducer; 1 to 400m
  • DRX-46 with WMB80 transducer; 2 to 600m
» Variable frequencies.
» Supported by multiple client applications to meet different customer requirements.
» Direct Ethernet connection to multiple client applications.
» Continuous real-time 2D and 3D mapping.
» Easy to operate and quick to install.
» Web based setup and configuration.
» Beam stabilisation.
» Variable beam width.

2 SYSTEM OVERVIEW

The WASSP multibeam sounder system requires the following components:

DRX; Transmit, receive, digital signal processing, display processing, License management and data server for client applications.

WASSP TRANSDUCER; See WASSP Transducer Reference Manual.

PC; Control, post processing and viewing of sounder, sonar and mapping needs to be handled by a suitable application, running on PC or tablet.

GPS; Position and time required for water column and bathymetry geo-referencing.

HEADING SENSOR; Required for correctly orienting the multibeam data.

MOTION SENSOR; Required for stabilising the water column and bathymetry data for vessel roll, pitch and heave.

SOUND VELOCITY PROBE; Required for correcting Sound Velocity in order to improve depth accuracy across the swath.

SOUND VELOCITY PROFILER; For accurate range measurement, sound velocity needs to be known at the transducer and through the water column. The Sound Velocity Profile information can be applied if using 3rd Party applications supporting SVP.

NOTE: As with any multibeam sounder, the quality of the sensors connected will directly affect the performance of the system. Enhancements to system performance include using high precision RTK GPS, accurate sound velocity measurements, sound velocity profiles, and high performance motion sensors. Your WASSP dealer can advise on sensors to suit your requirements. WASSP recommended sensors are also detailed in this manual, *see "Appendix B - Supported Sensors and Sentences" on page 82.*

The WASSP system can be supplied in various configurations to allow customised or turnkey solutions. These include:

» DRX and transducer with WASSP CDX and sensor package; Customer supplies PC or tablet and optionally 3rd Party navigation, fishing or survey package.

» DRX and transducer with WASSP CDX; Customer supplies sensors, PC or tablet and optionally 3rd Party navigation, fishing or survey package.

» DRX and transducer with WASSP CDX and sensor package and wireless package; Customer supplies PC or tablet.

For details on WASSP system packages available see wassp.com

NOTE: Sensor package details can be found in the WASSP Sensor Box Installation Manual.

Some typical system configurations are as follows:

2.1. COMPLETE SYSTEM

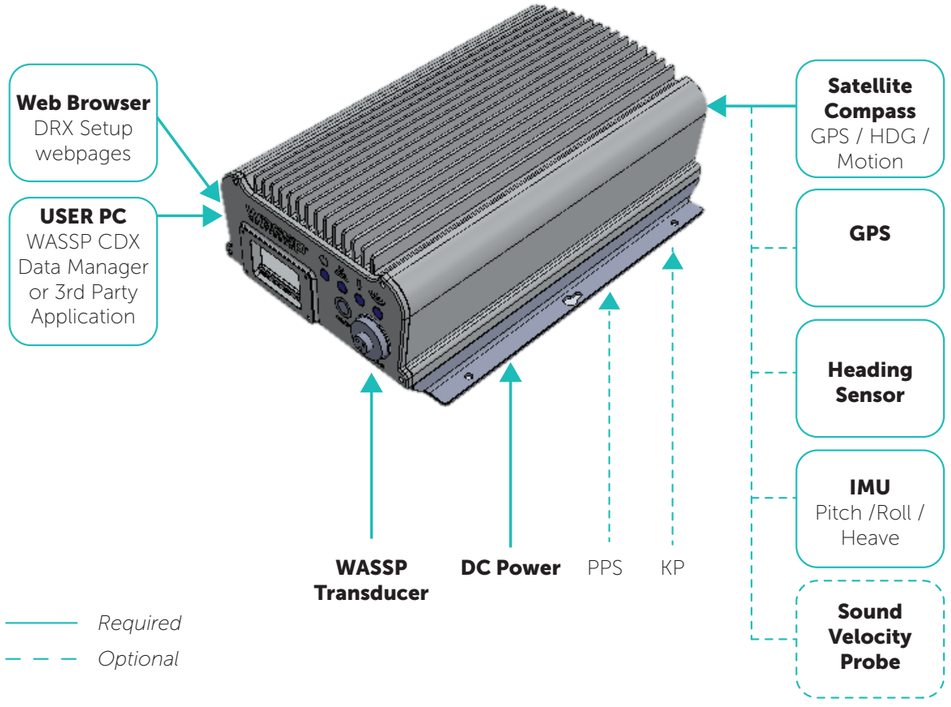


Figure 1. Complete System

2.2. RECOMMENDED SYSTEM

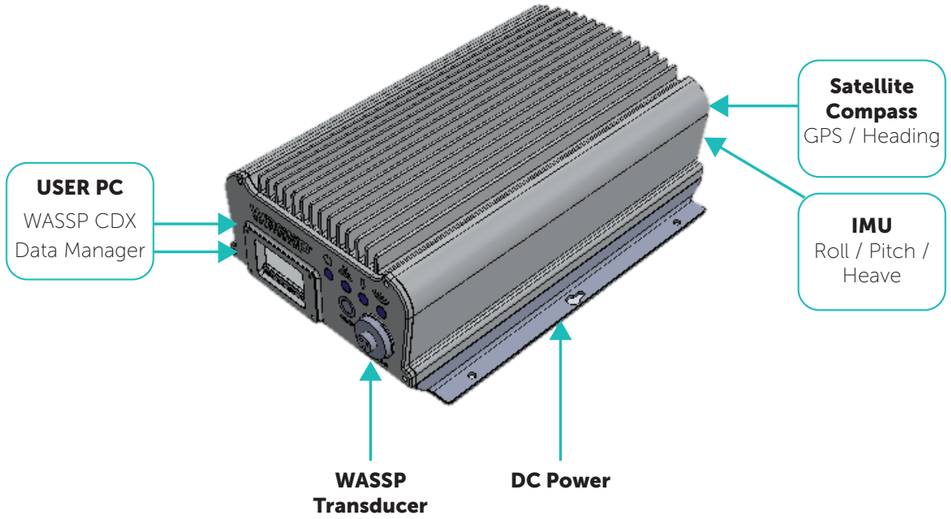


Figure 2. Recommended System

See "Appendix B - Supported Sensors and Sentences" on page 82 for supported sensors.

2.3. SURVEY SYSTEM

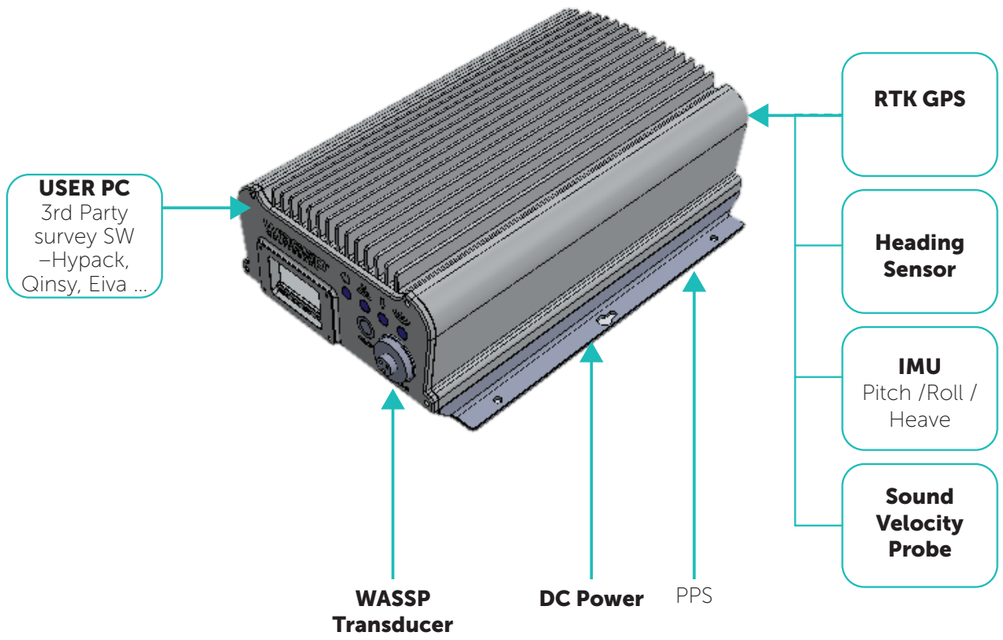


Figure 3. Survey System

NOTE: Check "Appendix B - Supported Sensors and Sentences" on page 82 for which sensors and sentences are support for input of position, heading, attitude and sound velocity.

NOTE: Images show DRX-32 throughout the manual. See "7 Outline Drawings" on page 61 for DRX-32 and DRX-46.

3 INSTALLATION PROCEDURES

Basic Installation Flow:

1

CHECK INSTALLATION PARTS

(Section "3.1. Installation Parts" on page 14)

- Check that all parts for installation have been received.
  This should include: cables, connectors, brackets etc.

2

TRANSDUCER

(Section "3.2. Transducer" on page 14)

- Install the Transducer
- Install the Transducer Cable Gland

3

LOCATE DRX / GPS / SENSORS

(Section "3.3. Locating the DRX System" on page 14)

- Run cables to DRX location

4

MOUNT THE DRX

(Section "3.4. Mounting the DRX" on page 15)

5

CONNECTING THE DRX

(Section "3.5. Connecting the DRX" on page 17)

- Connect Power to DRX
- Connect Transducer to DRX
- Connect Sensors to DRX

6

CONNECT DISPLAY AND CONTROL DEVICE

(Section "3.6. Display and Control Devices" on page 22)

- DRX Setup and Configuration
- Control, Display and Data

3.1. INSTALLATION PARTS

Standard supply:

» 1 x DRX unit
» 4 x Connector plugs
» 1 x power cable
» 1 x LAN cable
» 1 x USB Flash Drive:
  • Find My DRX Application
  • WASSP CDX Application
  • WASSP Utilities
  • License key for Data Manager
» Depending on kit:
  • Transducer installation kit (a package with a transducer cable clamp, a TX connector and installation manual)
  • Widescan Sensor package (refer to Sensor Box Installation Manual)
» WASSP DRX Installation Manual

3.2. TRANSDUCER

The DRX supports multiple transducer types and can be setup to operate in a variety of configurations. Typical setup will be multibeam wideband mode with:

» WMB160
» WMB80

Detailed specification and mounting methods for supported transducers is described in the WASSP Transducer Installation Manual.

Transducer selection is described in *"5.2.4. Data Setup Tab" on page 37.*

3.3. LOCATING THE DRX SYSTEM

The DRX is a highly sensitive receiver which is capable of discerning signals of less than one microvolt. In order to get the highest performance out of the DRX system keep the transducer, transducer cable and the DRX far away from sources of electrical and acoustic noise. AC/DC inverters and DC/DC converters are particularly noisy and even if not used to power the system, should be kept as far away as possible.

The DRX will need to be located with access to all required sensors. This needs to include transducer cable, GPS, motion sensor and LAN connections. Serial cables from sensors should be run direct to DRX with no splitters or interfaces boxes.

When selecting a mounting location, keep the following points in mind to maintain optimal performance:

» Maintain ambient temperature in the vicinity of the DRX within operating specifications. Operating in temperatures outside of specification will result in reduced operating lifetime or direct failure due to overheating:
  • The area needs to be well ventilated in order to avoid local ambient increase from self heating.
  • Keep out of direct sunlight. Exposure to sunlight will result in direct solar gain
  • Keep away from exhaust pipes and vents.
» Avoid electrical and acoustic noise as this will have a direct impact on system performance:
  • Avoid locations close to electrical equipment such as inverter, converters and other power supplies.
  • Keep away from electromagnetic field-generating equipment such as motors and generators.
» To avoid damage to the DRX:
  • Locate where Shock and vibration are minimal.
  • The area should not be prone water ingress or high moisture content.

CAUTION: Electrical or acoustic noise will directly impact system performance and signal integrity. AC/DC inverters and DC/DC converters will impact system sensitivity and can cause system noise even if not directly connected. If an AC/DC or DC/DC PSU is required only use low noise, good quality products in order to minimise impact on system performance.

CAUTION: Operating outside the temperature specification will reduce the operating lifetime of the DRX. *For specifications, see "9 Technical Specifications" on page 69.*

Refer to Knowledge Base for guidelines on the Operating Environment. *"Appendix E - Product Registration, Support and Resources" on page 89.*

3.4. MOUNTING THE DRX

Installation & Mounting Considerations

The DRX can be installed on a desktop, deck or on a bulkhead.

Using the mounting flanges on the bottom plate, the DRX is mounted vertically on a bulkhead, or horizontally on a hard surface. Important considerations are:

» A vertical position is ideal for optimal thermal performance (Transducer Connectors front face down). *See "Figure 4. DRX Bulkhead Mount" on page 16.*
» The second option is horizontal on a hard, flat surface. *See "Figure 5. DRX Horizontal Mount" on page 16.*
» If mounted in an enclosed space, forced ventilation will be required to maintain an ambient temperature within the stated limits around DRX. *See "Figure 4. DRX Bulkhead Mount" on page 16.* and *See "Figure 5. DRX Horizontal Mount" on page 16.*
» Leave slack in cables for maintenance and servicing ease.
» For maintenance and checking purposes, leave sufficient space at the sides and rear of the DRX installation location.
» Fasten the DRX to the mounting location with a minimum of four self tapping screws. *See Section "7 Outline Drawings" on page 61* for DRX dimensions and mounting clearances.
  • Mounting screws; Minimum M6 x 40mm x 4.
  • When installing the DRX, thread locking fluid or locking washers are recommend to avoid vibration loosening.
  • Anti Vibration Mounts are recommended.
» DRX should be always be mounted on a hard surface capable of supporting the DRX weight.

CAUTION: Operating outside the temperature specification will reduce the operating lifetime of the DRX. For specifications, see *"9 Technical Specifications" on page 69*.

.

CAUTION: IF DRX is mounted in an enclosed space forced ventilation as described below is required.

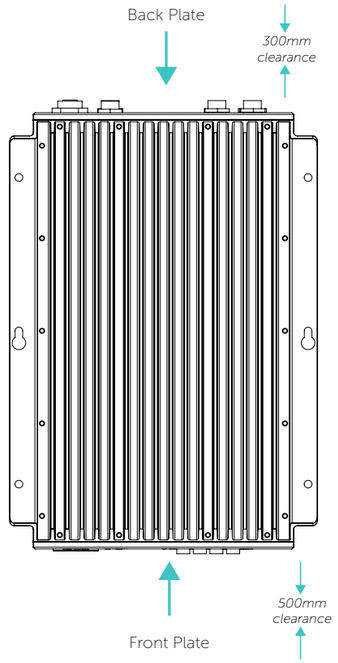


Figure 4. DRX Bulkhead Mount

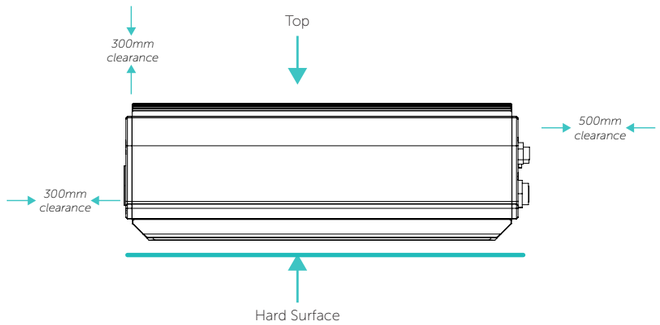


Figure 5. DRX Horizontal Mount

Figures 4 and 5 show clearance required for cabling and forced air ventilation if DRX is in an enclosed space.

Before installing the DRX in an enclosed space ensure that the ventilation is sufficient to prevent overheating. Consider the following:

» Cool air supply needs to be able to adequately dissipate the thermal output of DRX.

» Ensure the hot exhaust air from the enclosed area does not recirculate into the DRX. Perforations in the top will assist in removing exhaust air.

» Install the DRX in a position to allow the air flow to circulate effectively through the outlet.

» Route all cabling to minimise blockage of airflow.

NOTE: If operating in a high ambient environment forced airflow over the DRX will significantly improve thermal performance. Always make sure that there is adequate ventilation.

3.5. CONNECTING THE DRX

This section describes the installation requirements for cables from and to the DRX. Access to, and connection of all cables should be performed by a qualified installer.

3.5.1. Power Supply

The DRX should use a clean power supply. For best performance use a DC battery supply or as a secondary alternative it is recommended to use a low noise converter.

CAUTION: A noisy power supply will have direct impact on system performance.

3.5.2. Connectors and Components

This section identifies the various connectors exposed on the DRX.

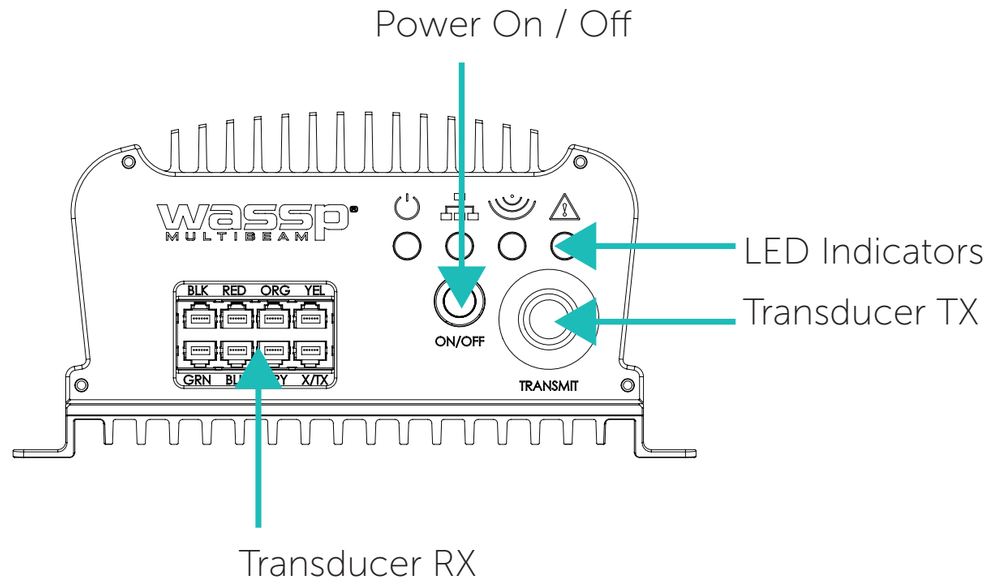


Figure 6. Front Plate

NOTE: X/TX connector in Transducer RX block is only used for IP67 version of DRX.

For descriptions, *see "3.5.3.1. Cables and Components – Front Plate" on page 18.*

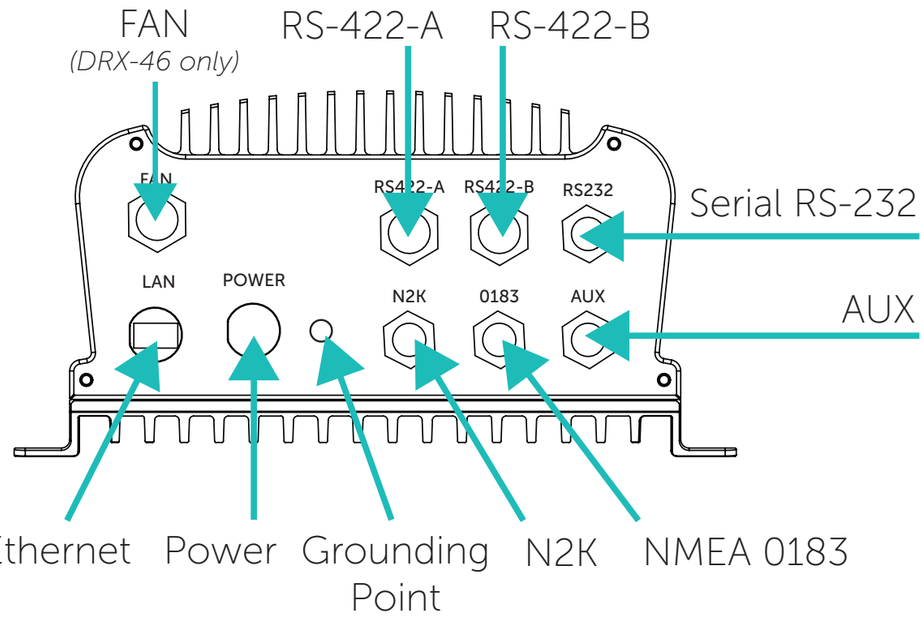


Figure 7. Back Plate

CAUTION: All serial cables from sensors on RS-232, RS-422 or NMEA 0183 should be direct with no splitters or interface boxes, unless supplied by WASSP. Failure to do this will result in compromised mapping performance due to potential timing issues.

For descriptions, *see "3.5.3.2. Connectors and Components – Back Plate" on page 20.*

3.5.3. Cables and Components

3.5.3.1. Cables and Components – Front Plate

Power On/Off

The power button controls system on/off through soft control. It requires power to be connected to the unit.

» Short press the power button to turn the power on. To power down, press and hold the power button for 4 seconds (to prevent bumping starting a power down).

» Power on/off can also be controlled remotely using the remote control cable on back plate, referenced in the following page.

NOTE: Remote Power Control is described in *"3.5.3.2. Connectors and Components – Back Plate" on page 20.*

Transducer RX

The Transducer RX is connected to the DRX through seven receive cables. The receive cables must be connected in the colour order shown on the connector.

See "Appendix A.1 Transducer RX" on page 70 for connection specification.

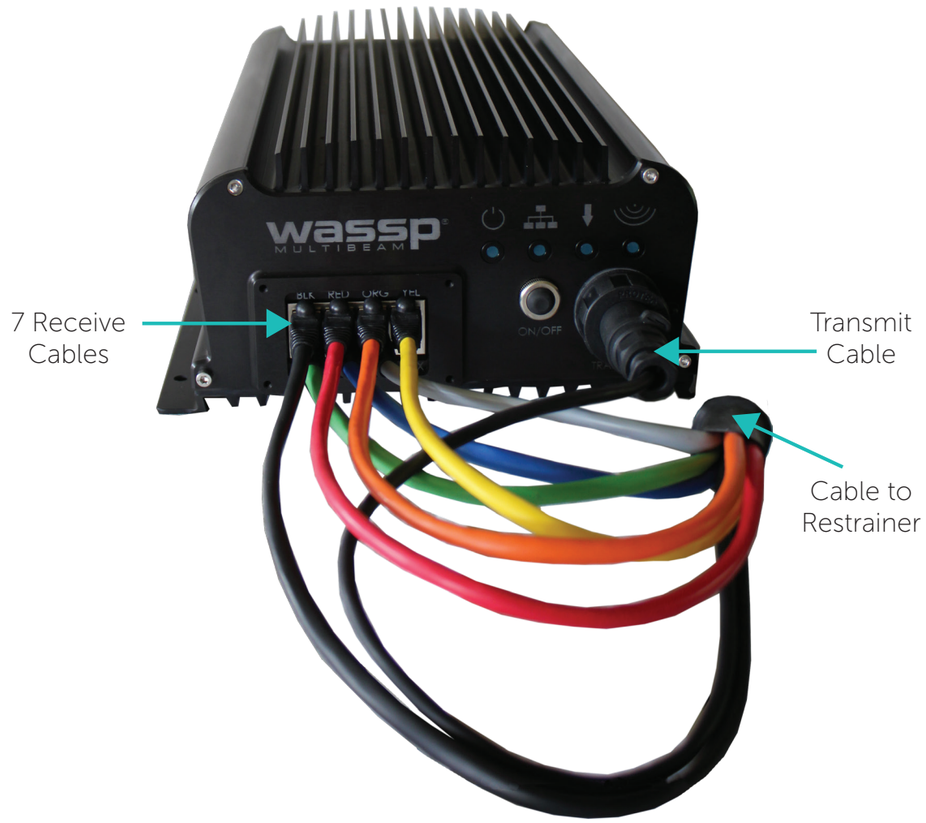


Figure 8. RX Cable Connection

CAUTION: The 7 receiver cables MUST be connected in the colour order indicated on the DRX. Failure to do this will result in faulty operation of the WASSP system.

CAUTION: The cable MUST be fitted with the supplied cable restrainer to prevent stress on the RJ45 Receive connector block. *See "Appendix A.2 Transducer Cable Restrainer" on page 71.*

NOTE: Actual product may differ from images depending on model. *See "7 Outline Drawings" on page 61.*

Transducer TX

The Transducer TX cable applies transmit signal to the transducer.

See *"Appendix A.3 Transducer TX" on page 72 for connection specification.*

3.5.3.2. Connectors and Components – Back Plate

RS-232 IN/OUT

Connector **RS232**

RS-232 is a serial connection for sensors/processors that natively output RS-232. For NMEA 0183 talkers it will depend on the instrument as to whether it will be RS-232 compliant or require a converter. RS-232 supports power out at same voltage as DRX power supply.

See "Appendix B - Supported Sensors and Sentences" on page 82.

RS-232 can be configured using the DRX SETUP WEBPAGES. *See "5.2. Commissioning Step 2: Sensor Configuration" on page 34.*

See "Appendix A.4 RS-232" on page 73 for connection specification.

RS-422 IN/OUT

Connector **RS422-A and RS422-B**

RS-422 is a serial connection for sensors natively outputting RS-422 or by using RS-232 to RS-422 converter. For NMEA 0183 talkers it will depend on the instrument as to whether it will be RS-422 compliant or require a converter.

The RS-422 Connector also supports PPS IN:

» RS-422-A supports power out at same voltage as DRX power supply

» RS-422-B allows data forwarding and power out at same voltage as DRX power supply

See "Appendix B - Supported Sensors and Sentences" on page 82.

RS-422 can be configured using the DRX SETUP WEBPAGES. *See "5.2. Commissioning Step 2: Sensor Configuration" on page 34.*

See "Appendix A.5 RS-422-A" on page 74 and *"Appendix A.6 RS-422-B" on page 75* for connection specifications.

NMEA 0183

Connector **0183**

NMEA 0183 is a serial connection for sensors natively outputting NMEA 0183 (single talker, multi listener). As well as an NMEA input, this connector also features an NMEA output.

The 0183 Connector also supports PPS IN.

See "Appendix B - Supported Sensors and Sentences" on page 82.

NMEA 0183 can be configured using key DRX SETUP WEBPAGES. *See "5.2. Commissioning Step 2: Sensor Configuration" on page 34.*

See "Appendix A.7 NMEA 0183" on page 76 for connection specification.

Remote Power

Connector **AUX**

A local supplied latching switch can be connected to pins eight (Remote PWR On) and nine (Remote PWR On GND) of connector AUX. When the switched is closed the DRX will power on. When the switch is open (circuit open) then the DRX will power off.

*See "Appendix A.8 Remote Power" on page 77 f*or connection specification.

KP1/KP2 IN

Connector **AUX**

KP IN interface is to allow the DRX to transmit in sync with another sounder/sonar. This feature is useful for helping reduce transmit pulse interference.

KP IN takes the key pulse from an external system (master) and synchronises the DRX (slave) transmit pulse with that key pulse as a trigger.

See "Appendix A.9 KP1/KP2 In" on page 78 for connection specification.

See "5.2.6. Key Pulse Tab" on page 40 for connection information.

KP1 OUT

Connector **AUX**

KP OUT interface is to allow the DRX to transmit in sync with another sounder/sonar. This mode allows the DRX to be the KP master, and the receiving sounder/sonar to be the slave. This feature is useful for helping reduce transmit pulse interference.

This mode is recommended to optimise the nterference immunity from the connected sounder.

See "Appendix A.10 KP1 Out" on page 79 for connection specification.

See "5.2.6. Key Pulse Tab" on page 40 for connection information.

PPS IN

Connectors **RS422-A, RS422-B and 0183**

Pulse-per-second (PPS) input allows connection equipment with a PPS timing output. PPS input allows the DRX to be accurately synchronised with GPS UTC enabling highly accurate positional timing accuracy, potentially improving mapping data positional accuracy by removing GPS latency issues.

Through the DRX SETUP WEBPAGES the user can choose which PPS input is tied to which input, and view that the signal is being correctly received. *See "5.2. Commissioning Step 2: Sensor Configuration" on page 34.*

See "Appendix A.5 RS-422-A" on page 74 and *"Appendix A.7 NMEA 0183" on page 76* for connection specification.

Power

The DRX is designed to be run on DC voltage, *see specs in "9 Technical Specifications" on page 69.*

See "Appendix A.11 Power Connection" on page 80 for connection specification.

Ethernet

Connector **LAN**

The Ethernet link is used for all communication between the client application 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 and post processing to the client device.

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).

The Ethernet connection needs to support at least Gigabit network to enable full functionality.

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.

See "Appendix A.12 Ethernet" on page 80 for connection specification.

NMEA2K

Connector **N2K**

See "Appendix B - Supported Sensors and Sentences" on page 82.

See "Appendix A.13 NMEA2K" on page 81 for connection specification.

Power Out

Connector **FAN**

Availability dependent on model.

The fan connector powers the optional single or double fan assembly.

See "Appendix A.14 FAN" on page 81 for connection specification.

Grounding Point

The grounding point is used to minimise the pickup of noise from interfering sources.

The earth lug on the DRX should be commected to a good earth point on the vessel. Use a short braided cable for optimal noise rejection.

CAUTION: Noise due to poor grounding will have direct impact on DRX performance and signal integrity.

3.6. DISPLAY AND CONTROL DEVICES

The DRX supports two levels of communication over the Ethernet link; web browser based DRX SETUP WEBPAGES and IP based DRX client applications.

In order to initiate communication with the DRX the client needs to know the DRX IP address. This can either be done through the client application discovery mechanism or using the 'FIND MY DRX' Help utility.

The 'FIND MY DRX' utility can be run on any PC connected to the DRX over the Ethernet connection. 'FIND MY DRX' will find any DRX on the network by IP address.

NOTE: The PC only needs a physical Ethernet connection to find DRXs on the network. IP address and subnet is unimportant, however, for connectivity the DRX Client Application needs to be on the same TCP/IP Subnet.

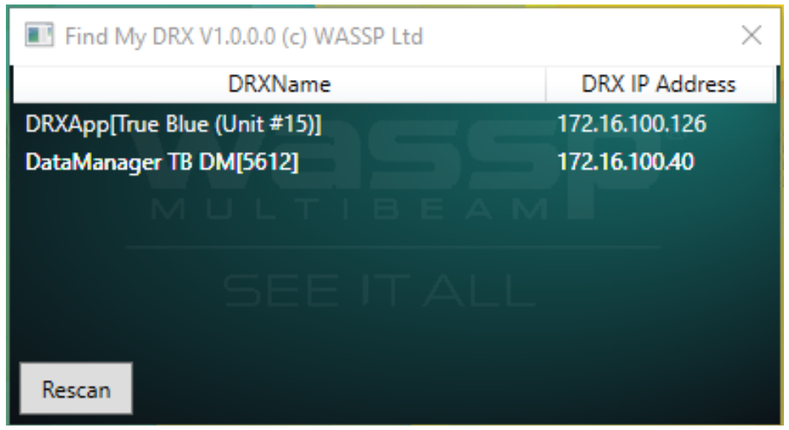


Figure 9. Find My DRX App

3.6.1. DRX Setup Webpages

DRX SETUP WEBPAGES are used for upgrade, setup, feature licencing and configuration. For more details *see "4 Operating the DRX" on page 24 and "5 Sensor Configuration" on page 32.*

The DRX SETUP WEBPAGES are launched by opening any supported web browser and entering the DRX IP address followed by port 2001 e.g. 169.254.54.69:2001

NOTE: Clicking on the appropriate DRX in 'FIND MY DRX' will automatically launch the web browser with the appropriate URL.

NOTE: Chrome browser, shipped with DRX, is fully supported. Other browsers may not behave as expected. If webpage does not update use CTRL F5.

CAUTION: Only one instance of 'DRX SETUP WEBPAGES' should be run otherwise a corruption may occur.

3.6.2. DRX Client Applications

Ethernet IP is used for discovery, control and data through supported DRX client applications. Current supported client applications include WASSP CDX, 3rd Party Navigation, sounder and survey applications and are described in *"6 Control and Display Application Support" on page 55.*

NOTE: For DRX client application connection, the DRX and client application need to be on the same TCP/IP subnet.

If DRX and client applications have incompatible IP addresses, discovery will succeed but connection will fail.

4 OPERATING THE DRX

» To turn ON the DRX, short press the power key.

» To turn OFF the DRX, press and hold the power key for more than 4 seconds. All LEDs will turn off, indicating that power has been turned off.

4.1. POWER

The DRX can be powered on/off using the power button or the remote power switch.

4.2. LED STATUS

The DRX features 4 LEDS next to the power button which give a quick indication of the status of the DRX system.

4.2.1. Startup sequence.

The boot sequence is as below:

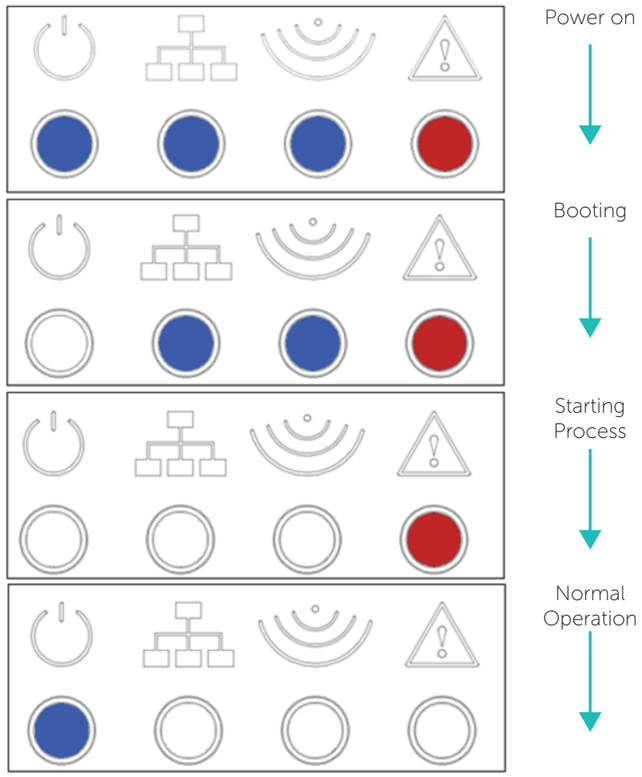


Figure 10. Startup Sequence

4.2.2. Normal Operation LED Indications

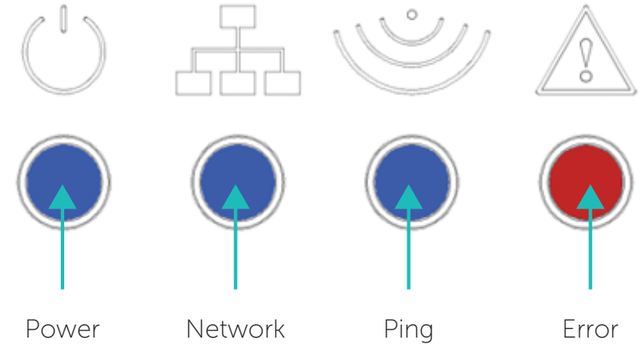


Figure 11. Normal Operation LED Indications

Power LED:

Off = Power OFF

On Solid = DRXApp is running

Network LED:

Off: No Link (cable not connected)

Solid: Link/Link Established

Blinking: TX or RX traffic

Ping LED:

Off: Not pinging

Blinking: Pinging with frequency relative to ping rate (not actual ping rate).

Error LED:

Off: Normal operation

On: (While booting) system is booting

On: (After booting) Indicates an error state. All LED states should be noted and reported to WASSP Support. See *"Appendix E - Product Registration, Support and Resources" on page 89*.

4.3. SYSTEM UPDATE & DIAGNOSTICS

The System section of the DRX SETUP WEBPAGES is used for checking DRX versions, upgrading the DRX and restoring the DRX settings.

Launching the DRX SETUP WEBPAGES is described in *"3.6. Display and Control Devices" on page 22.*

To check DRX version, open the DRX SETUP WEBPAGES and open the SYSTEM tab and open the UPGRADE tab. Versions should be recorded by copying and pasting or through screen capture.

CAUTION: Do not power down your DRX during the update procedure, this may result in complete system failure.

CAUTION: System upgrade cannot be performed whilst DRX is pinging as this may result in failure.

NOTE: Note down version numbers before and after upgrading.

To perform a system upgrade:

1. Open the DRX SETUP WEBPAGES, open the SYSTEM tab and select the UPGRADE tab.
2. Select the BROWSE button to navigate to the folder containing the software update package and select the UPLOAD button.
3. During the update procedure the DRX system will reboot. Once completed, check the new software version in the System tab.

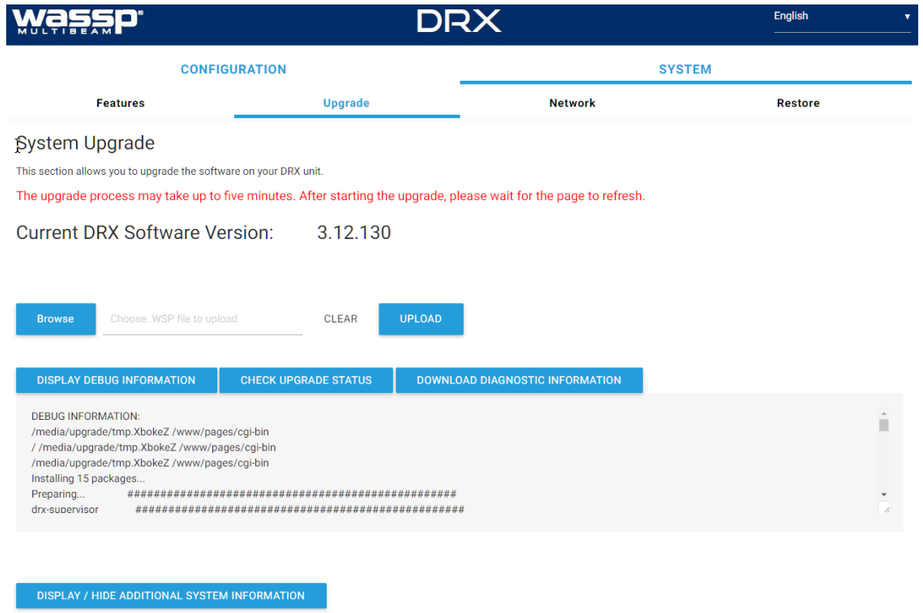


Figure 12. System Upgrade

Upgrade Error Codes

Upgrade may fail for various reasons. An error code and/or text will be displayed in the message box.

1	Transferred Data is not a file.
2	Transferred File is not of valid type.
3	Transferred File contains bad data.
4	Unable to initiate upgrade, stage 1.
5	Failed to install.
6	Unable to initiate upgrade, stage 2.
7	Unable to restart after upgrade.
8	No File transferred.
9	Undefined.
10	Failure. See error log files for detail. *Contact WASSP Support if this error occurs.*

TIP: F5 (refresh button) should be pressed if there is any doubt in data consistency between the Webpage and the DRX.

4.3.1. Diagnostics Information

Under SYSTEM tab, UPGRADE option there are diagnostics and information options.

- » DISPLAY DEBUG INFORMATION will display the DRX logs in the display window.
- » CHECK UPGRADE STATUS can be used to confirm with an upgrade has been completed successfully.
- » DOWNLOAD DIAGNOSTICS INFORMATION will download the DRX logs.

NOTE: If there is anything unusual requiring WASSP Support the DRX logs should be supplied for analysis

- » DISPLAY/HIDE SYSTEM INFORMATION shows detailed system information with version and product details.

4.4. SYSTEM RESTORE

System Restore sets all settings to factory default values.

1. Select the SYSTEM tab and select the RESTORE tab.
2. Click the RESTORE DEFAULTS button to restore the unit to default configuration settings. The unit will reboot and you will then need to re-enter all the sensor setup and offset values. *See "5 Sensor Configuration" on page 32.*

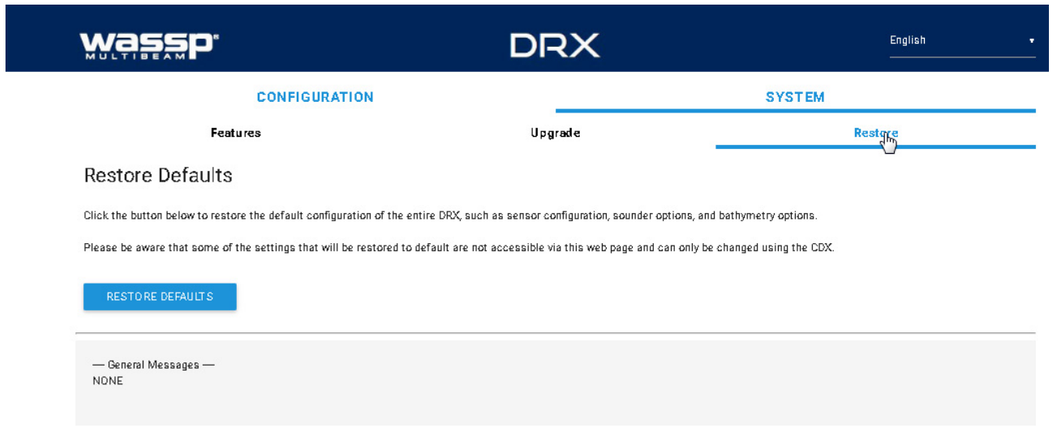


Figure 13. Restore Defaults Tab

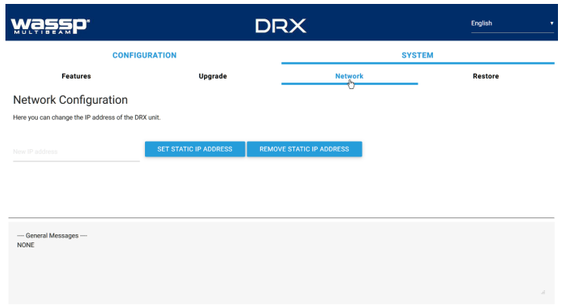
NOTE: RESTORE DEFAULTS will restore entire DRX configuration, not just Sensor Setup.

4.5. NETWORK CONFIGURATION

Network configuration allows setting the DRX to a fixed IP address.

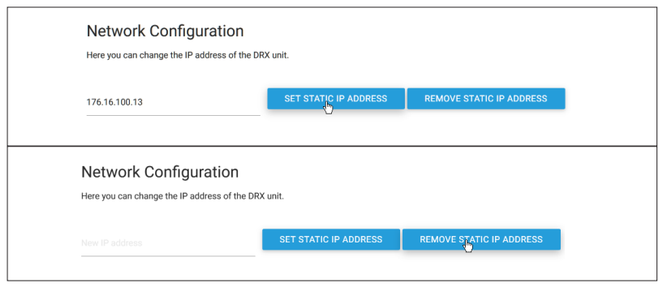
By default DRX will be assigned an IP through Zero-configuration or by a DHCP server if there is one on the LAN. By setting a fixed IP this will override automatic assignment.

1. Select SYSTEM tab and select NETWORK tab.



2. Use the SET STATIC IP ADDRESS button to set a fixed IP.

3. Use the REMOVE STATIC IP ADDRESS BUTTON to revert to automatic IP assignment.



NOTE: The PC/Client Application needs to be in the same subnet as the DRX for connectivity. DRX IP address can always be identified using 'Find my DRX' ; see "Figure 9. Find My DRX App" on page 23.

4.6. SYSTEM FEATURES

DRX optional features can be enabled through license keys.

To enable a feature, the appropriate feature license file needs to be purchased through a WASSP dealer or directly through WASSP Ltd. The license will be supplied as a license file over email, on a USB flash drive or other media. Available features can be seen by selecting SYSTEM tab and selecting FEATURES tab.

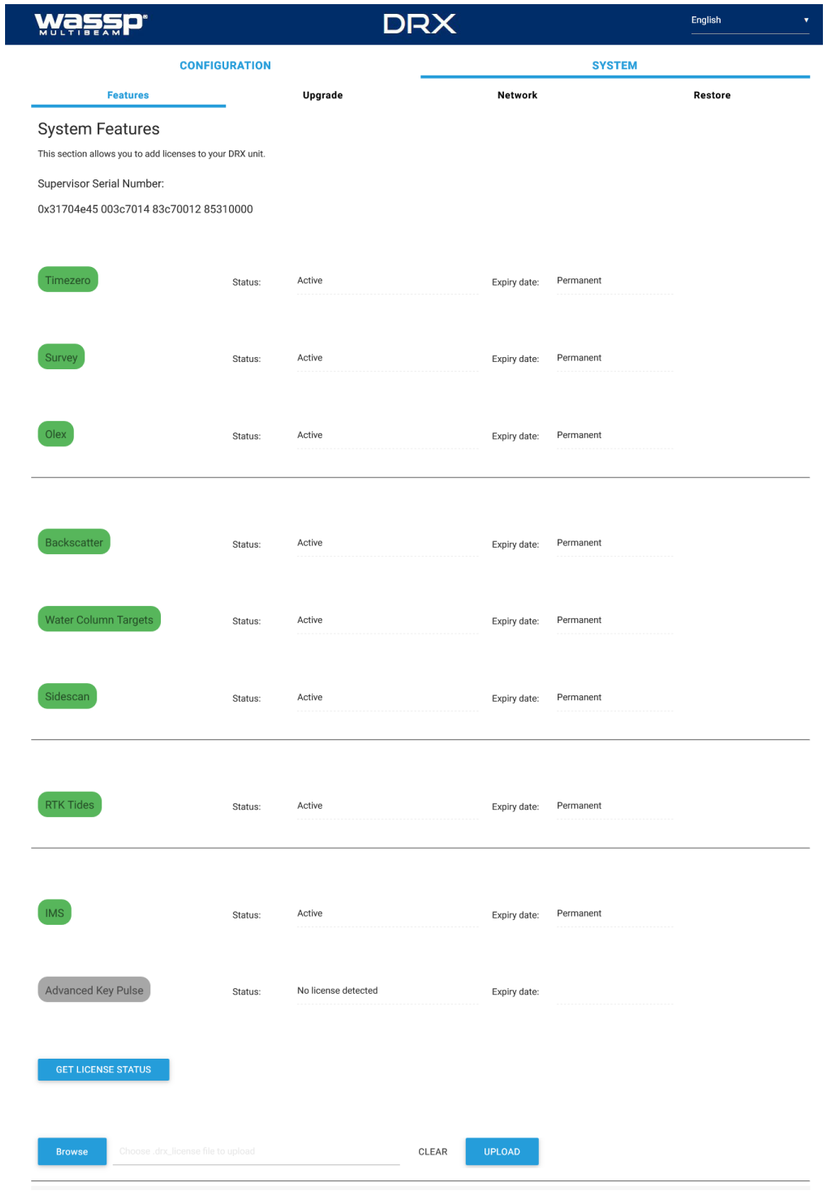


Figure 14. System Features

Licenses can be in one of 3 states:

- ACTIVE; License is installed and active.

NOTE: The license may be a permanent or time limited license.

- EXPIRED; License is installed but has expired/timed out.
- NO LICENSE; No License for this feature has been installed.

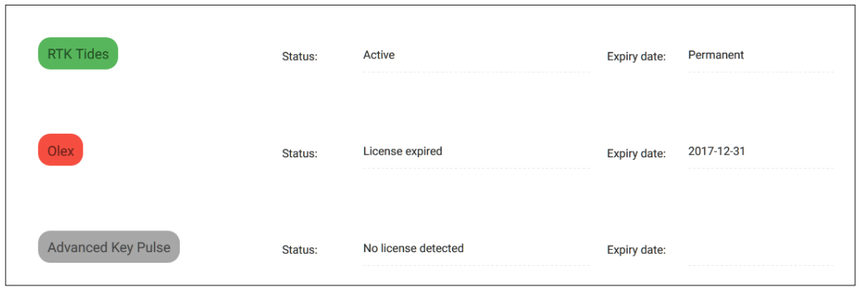


Figure 15. License Status

Licenced Features include:

Application Interfaces

TIMEZERO; Allows direct interface between DRX and TZ. TZ controls the DRX and displays data supplied by the DRX, depending on which display functionality is enabled.

SURVEY; Enables interface between DRX and various survey platforms. DRX supplies the appropriate data for post processing on the survey application.

OLEX; Allows interfacing to Olex through CDX. Control is required by CDX and display data is passed through to Olex.

Display Functionality

BACKSCATTER; Seafloor backscatter data is enabled allowing the client application to display backscatter strength on 2D and 3D overlays or to use for post processing.

WATER COLUMN TARGETS; Targets detections in the water column, such as fish, are enabled. This allows client applications to display discrete targets and their target strengths on the 2D or 3D displays.

SIDESCAN; Data is processed as sidescan is enabled. This allows port/starboard sidescan imagery on the client application.

Control Functionality

RTK TIDES; Use of GPS height can be used to compensate for sea level change. This is particularly useful for accounting for tidal height when mapping bathymetry. *See "5.2.8. Geoids Tab" on page 46 and "Appendix C - Sea Level Height using GPS Height" on page 84.*

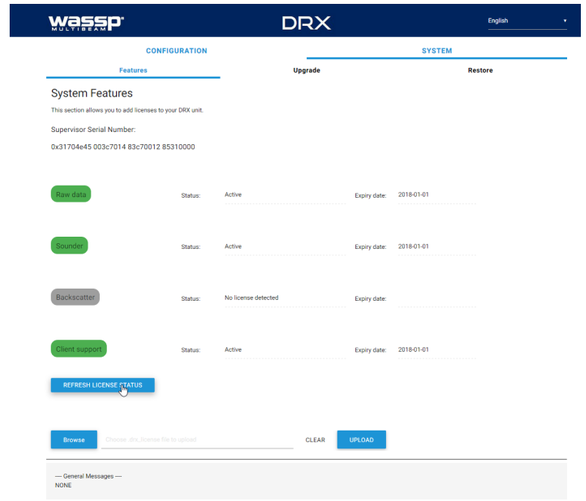
IMS; Used for automated optimisation of DRX for improving performance when there is acoustic interference. IMS is enabled or disabled from the client application. *See "Appendix D - IMS Control in CDX" on page 86.*

ADVANCED KEY PULSE; As part of IMS, AKP (Advanced Key Pulse) functionality can be used to improve management of interfering acoustic equipment. See *"5.2.6.4. Advanced Key Pulse" on page 43.*

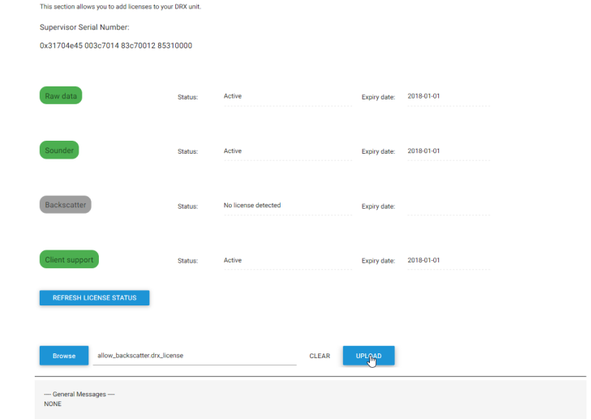
NOTE: IMS is not available on all DRXs. Check with WASSP Support with your DRX Serial Number for more information.

To install the license follow the steps:

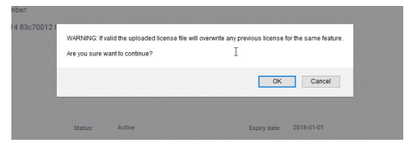
1. Select SYSTEM tab and select FEATURES tab.
2. Select the REFRESH LICENSE STATUS button to see current active Licenses and associated expiry date.



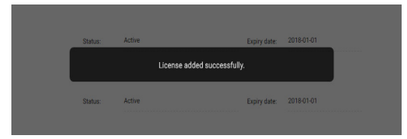
3. Select the BROWSE button to select the appropriate license file.
4. Select UPLOAD button for the selected license file.



5. You will be asked to confirm selection.



6. License file will be uploaded and applied.



5 SENSOR CONFIGURATION

The WASSP system requires position, heading, attitude, heave and time information in order to be fully functional. The overall performance will be directly affected by the quality of the sensors chosen and being configured as described below.

WASSP supplies sensor package kits for recommended install. See the WASSP Sensor Box Installation Manual for detailed information.

For supported sensors and sentences, *see "Appendix B - Supported Sensors and Sentences" on page 82.*

NOTE: Currently support sensors and sentences will depend on software version and can be found at wassp.com

5.1. COMMISSIONING STEP 1: SHIP MEASUREMENTS

Take measurements from the GPS antenna, motion sensor and transducer to the vessel's reference point. *See "Figure 16. Ship Measurements Diagram" on page 33*. **These measurements must be as accurate as possible.** The accuracy of these measurements have a direct effect on the accuracy of the recorded data.

Enter these values in the spaces below, and in the SENSOR INSTALLATION tab within the SENSOR tab of the DRX SETUP WEBPAGES. *See "Figure 19. DRX Setup, Sensor Tab" on page 37.*

NOTE: The Ships Reference Point is a point close to the ships centre of Pitch and Roll. It pays to make this point easy to measure to for improved accuracy of measurements. A good guideline for a reference point is a point near the water line in the centre of the ship (port to starboard) and half way down the length of the ship.

Transducer (XDCR) Depth (Draft) Displacement: m **A** _____

GPS X Displacement from reference: m **B** _____

GPS Y Displacement from reference: m **C** _____

GPS Z Displacement from reference: m **D** _____

Transducer (XDCR) X Displacement from reference: m **E** _____

Transducer (XDCR) Y Displacement from reference: m **F** _____

Transducer Z Displacement from reference: m **G** _____

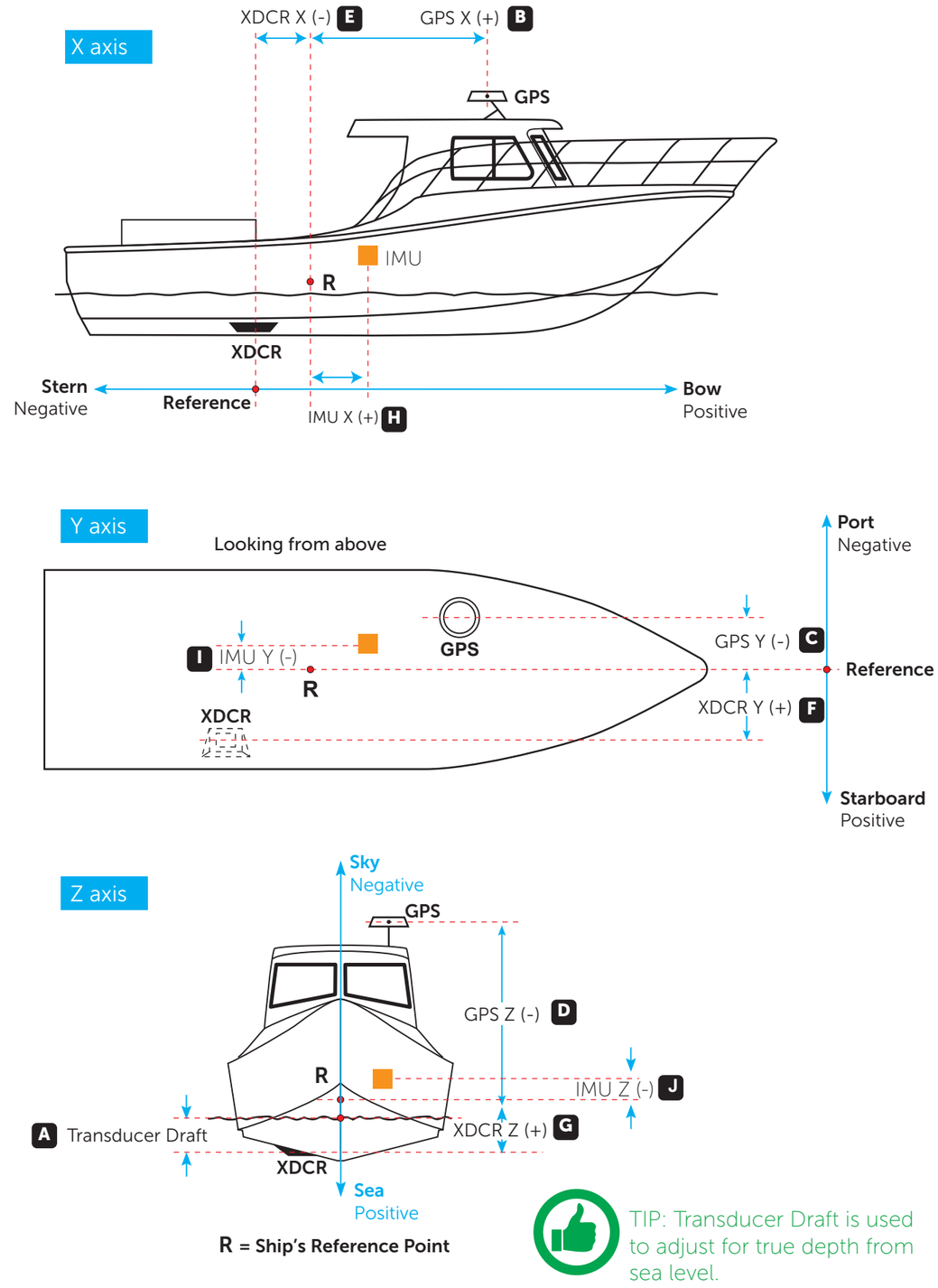
Motion Sensor X Displacement from reference: m **H** _____

Motion Sensor Y Displacement from reference: m **I** _____

Motion Sensor Z Displacement from reference: m **J** _____

NOTE: Separate sensors can be used for GPS data, heading, roll, pitch and heave as required. Make sure to note down all Sensor offset.

Sensor Installation



TIP: Transducer Draft is used to adjust for true depth from sea level.

Figure 16. Ship Measurements Diagram

5.2. COMMISSIONING STEP 2: SENSOR CONFIGURATION

The Configuration section of the DRX SETUP WEBPAGES is used for configuring the DRX physical ports and the sensors connected to the DRX.

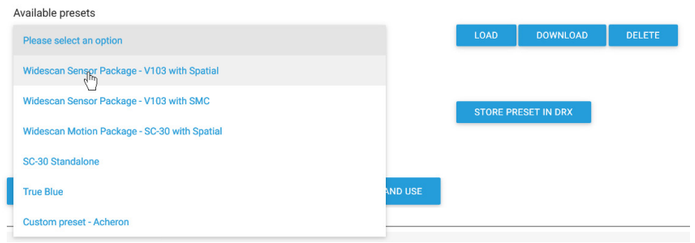
Launching the DRX SYSTEM WEBPAGE is described in *"3.6. Display and Control Devices" on page 22.*

5.2.1. Presets Tab

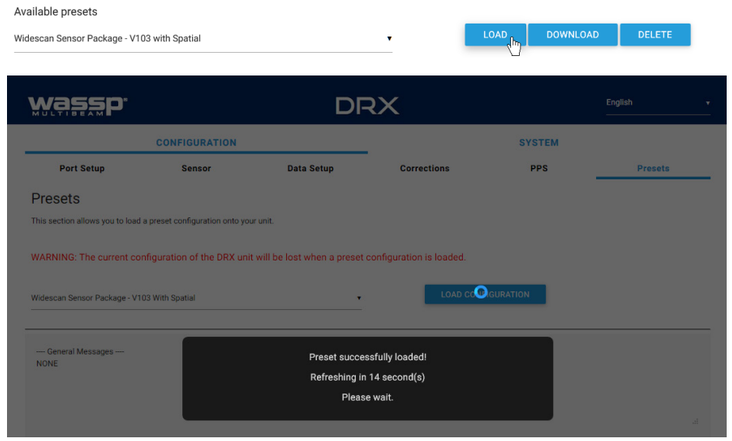
The PRESETS tab allows a selection of preconfigured sensor setup options and the ability to save and retrieve custom or user defined preset options.

5.2.1.1. Applying Presets

1. Select the required preset from the dropdown of AVAILABLE PRESETS.



2. Select LOAD to apply the chosen preset.
3. Presets will be loaded and set PORT SETUP, SENSOR, DATA SETUP, CORRECTIONS. PPS configuration.



NOTE: Sensor Offsets still need to be manually setup.

NOTE: Available Presets will consist of defaults loaded into the DRX and any custom presets applied by the user.

Preset options include:

» Widescan Sensor Package – V103 With Spatial; Sensor package supplied as optional kit. Reference Sensor Box Installation Manual for details.

» Widescan Sensor Package – V103 With SMC; Sensor Package available from WASSP Ltd. Configures as SMC IMU on **RS232** Port and V103 on **RS422** Port with PPS configures.

» SC-30 Standalone; Configuration for customer supply SC-30 used for Position, heading and attitude data. Configure with SC-30 on **0183** port.

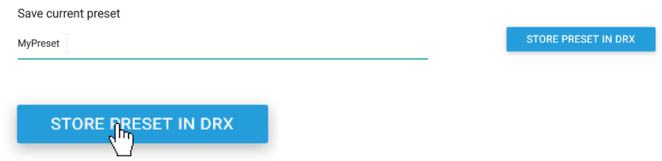
These presets may change depending on version and model.

NOTE: Presets will configure PORT SETUP, SENSOR, DATA SETUP, CORRECTIONS, PPS.

5.2.1.2. Saving Custom Presets

To save current configuration as a Preset:

1. Enter a name for the Preset under SAVE CURRENT PRESET.
2. Select STORE PRESET IN DRX.



The preset will be stored in the DRX.

5.2.1.3. Downloading and Uploading Presets

Custom configurations can be stored externally to the DRX.

1. Select a custom preset from the Available Presets
2. Select DOWNLOAD and store in your preferred location.

Custom configurations stored externally can be uploaded to the DRX

1. Select BROWSE and select the appropriate preset file.

2. Select UPLOAD or UPLOAD AND USE.

3. The preset will now appear under Available Presets as a custom preset.

NOTE: Only upload presets that were downloaded from the DRX.

5.2.2. Port Setup Tab

The PORT SETUP tab is used for configuring the physical DRX ports to receive data from the sensors attached to that port.

NMEA 0183 port can also be used to transmit data and uses the same configuration as receive.

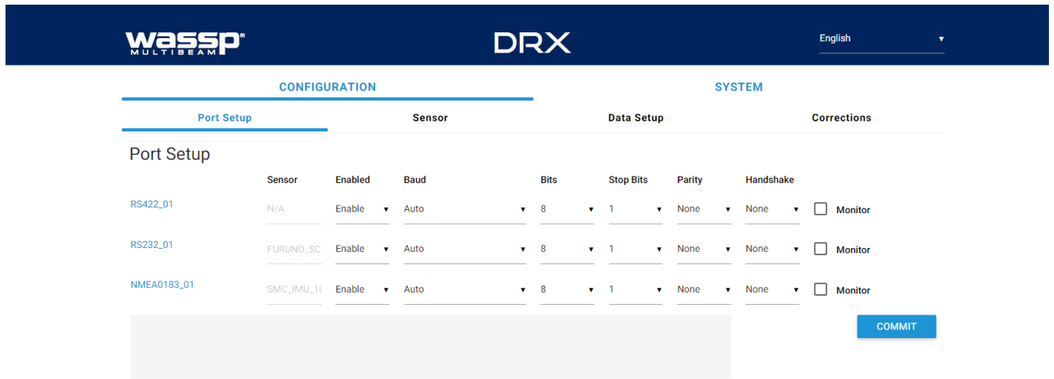


Figure 17. DRX Setup, Port Setup Table

The following options need to be set up for each of the DRX ports being used:

» Enabled; Marks a port as active or not active.

» Baud; Sets port's baud rate to match the sensor baud rate. Bits, Stop Bits, Parity and Handshake; Configures the port to match the incoming sentences from the sensor.

NOTE: You must COMMIT or these settings will be lost.

NOTE: Port assigned to sensor in the 'Sensor' tab.

TIP: F5 (refresh button) should be pressed if there is any doubt in data consistency between the Webpage and the DRX.

The monitor check box can be selected to display the incoming sentences on the specific port. This can be used to identify if the port is configured correctly and the sensors are outputting the correct data.

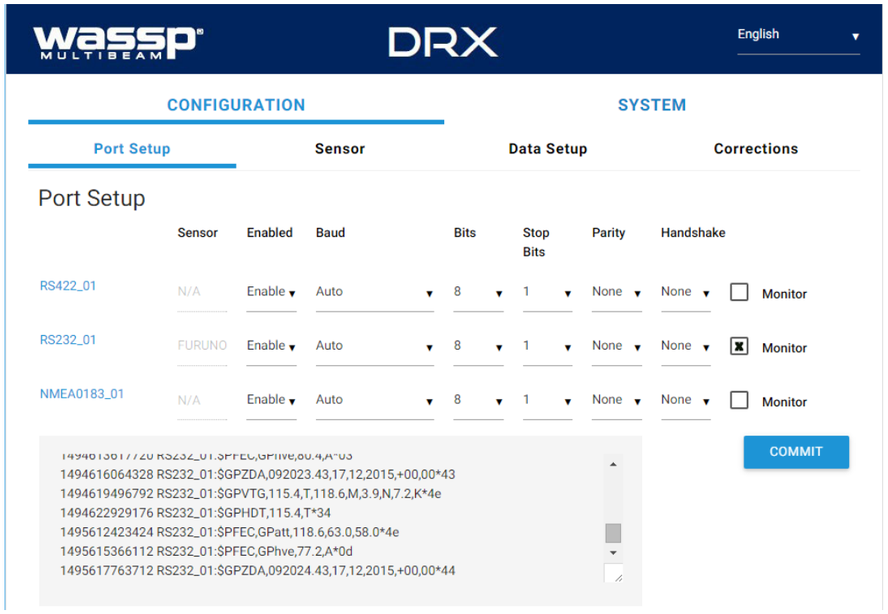


Figure 18. DRX Setup, Port Setup Tab with Sensor Data

5.2.3. Sensor Tab

The SENSOR tab is used to configure the physical position of each sensor being used and which port that sensor is connected to on the DRX. SENSOR tab is also used for selecting transducer type.

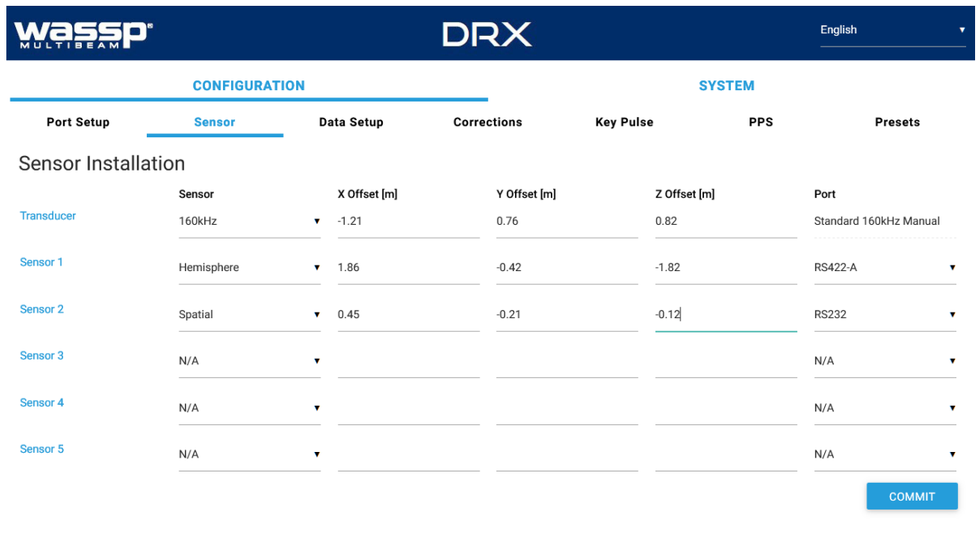


Figure 19. DRX Setup, Sensor Tab

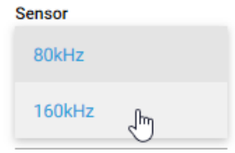
For each Sensor being used, set the following:

» SENSOR; Select the sensor type from the drop down list. Select USER DEFINED if the sensor being used is not listed (any sensors not listed have not been specifically tested with DRX).

» X, Y, Z OFFSET; Set the measurement as per section *"5.1. Commissioning Step 1: Ship Measurements" on page 32*.

» PORT; Select the physical port on the DRX that the sensor is connected to from the drop down list.

Transducer selection allows for currently available WASSP transducer supported by DRX.



NOTE: You must COMMIT or these settings will be lost.

NOTE: Offsets should be entered in meters to nearest cm (0.01m).

5.2.4. Data Setup Tab

The DATA SETUP tab is used to setup each external data type that is required by DRX to function correctly. Each of the data types; position, heading, roll, pitch, heave and time need to be set.

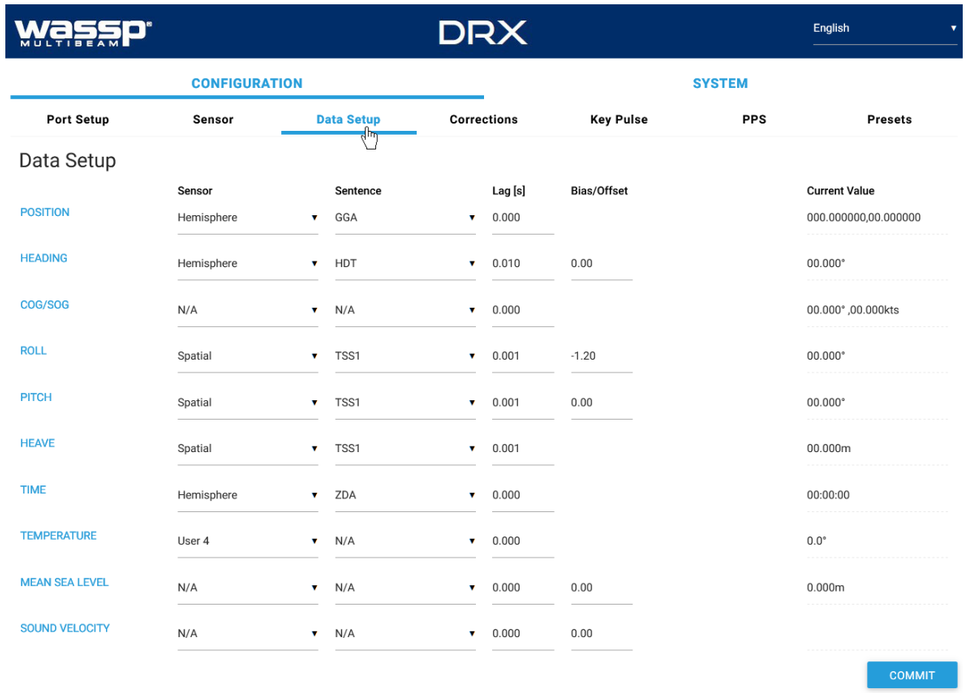


Figure 20. DRX Setup, Data Setup Tab

For each data type setup the following:

» SENSOR; The specific sensor that is supplying the data, selected from the drop down. This sensor will have been configured under the SENSOR tab.

» SENTENCE; Select the appropriate sentence from the drop down. This can be cross-referenced with the data being monitored under the PORT SETUP tab to make sure that it is available to the DRX.

» LAG; The sentence lag (also called latency or delay) from the specified sensor should be entered here. *Section "5.3. Commissioning Step 3: On Water Patch Tests" on page 49* gives detail on calculating delay for GPS position. Lag for attitude data should be obtained from the sensor manufacturer specification.

» BIAS; The bias (also called offset or correction) of a data type should be entered here. *"5.3. Commissioning Step 3: On Water Patch Tests" on page 49* gives details on calculating bias for each of roll, pitch and heading.

Data Types that are required to be setup include:

» POSITION and HEADING; Required for georeferencing the vessel for bathymetry mapping.

» ROLL PITCH and HEAVE; Required for compensating for vessel motion

» TIME; Required for UTC time synchronisation and specifically for PPS accurate time synchronisation.

Other data types that can be setup include:

» WATER TEMPERATURE; Used to calculate sound velocity which is required for multibeam operation

» SOUND VELOCITY; Direct input of sound velocity allows for accurate compensation for multibeam operation

» MEAN SEA LEVEL; Required if RTK Tides feature License is being used for compensating for sea level using GPS height. *See "5.2.8. Geoids Tab" on page 46.*

» COG/SOG; Allows for COG and SOG display the client application.

NOTE: 'Current Value' will display the values being used by the DRX. However these will be raw values and not account for latency settings.

NOTE: Lag is in seconds and Bias is in degrees. Lag should be entered to nearest millisecond and Bias to nearest 0.01 degrees.

NOTE: You must COMMIT or these settings will be lost.

5.2.5. Corrections Tab

The CORRECTIONS tab is used to enable or disable specific attitude corrections being applied, to invert attitude corrections, to correct for depth through adjusting transducer draft and to adjust swath width.

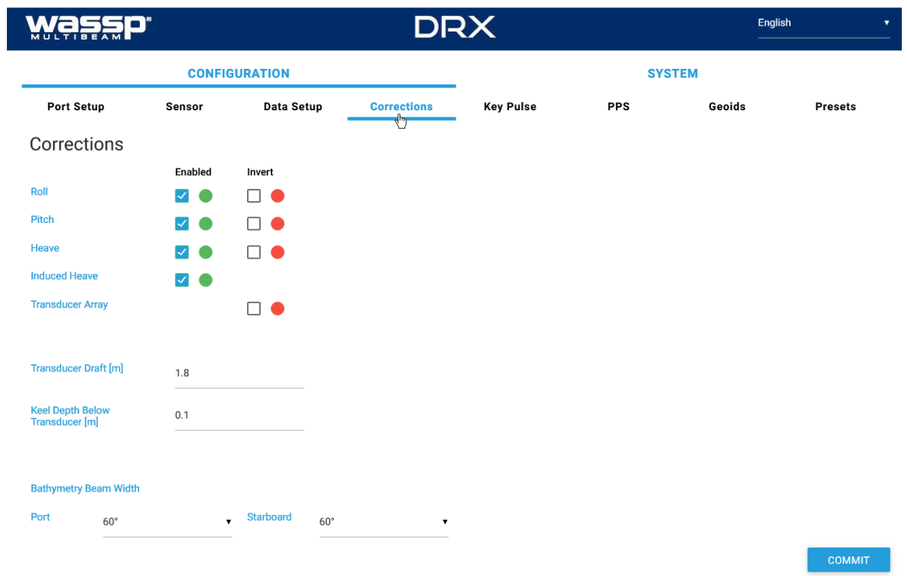


Figure 21. DRX Setup, Corrections Tab

By default, all attitude corrections should be applied for optimal performance. To enable or disable specific attitude corrections:

1. Select the check boxes of the attitude correction that should be applied, under ENABLED.
2. Press COMMIT button to save any changes.
3. The indicator beside the check box shows the status of the DRX. If the indicator is green the correction is enabled in the DRX. If the indicator is red the correction is disabled in the DRX.

Attitude corrections may need to be inverted if either the sensor is mounted incorrectly

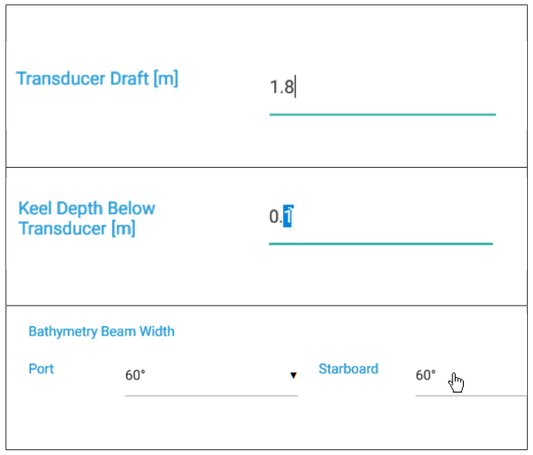
or if the sensor supplies inverted roll data, for instance:

1. Select the check boxes of the attitude correction that should be inverted, under INVERT.
2. Press COMMIT button to save any changes.
3. The indicator beside the check box shows the status of the DRX. If the indicator is green the correction is inverted in the DRX. If the indicator is red the correction is not inverted in the DRX.

TRANSDUCER DRAFT value will correct the depth by taking into account the transducer draft. *See "Figure 16. Ship Measurements Diagram" on page 33*, measurement A.

KEEL DEPTH VALUE will correct the depth by taking in to account the keel depth. *See "Table 3. NMEA Sentences Output" on page 83.*

BATHYMETRY BEAM WIDTH; The overall swath width for mapping can be adjusted using port and starboard angle from nadir. Maximum swath width is 60^0 either side of nadir for a 120^0 swath width.



NOTE: 'Induced Heave' may depend on whether a motion sensor is configured to account for induced heave.

NOTE: Transducer draft might be adjusted for change in ballast due to fuel, payload etc.

NOTE: You must COMMIT or these settings will be lost.

NOTE: Transducer Invert can be used to correct for a transducer being installed back to front.

5.2.6. Key Pulse Tab

The KEY PULSE tab is use for syncing the DRX transmit to other acoustic equipment that the DRX is physically wired to.

Key pulse configuration will be specific to the vessel and operating environment and is used to optimise operation for all of the equipment by minimising acoustic interference.

Key pulse is configured under the KEY PULSE tab.

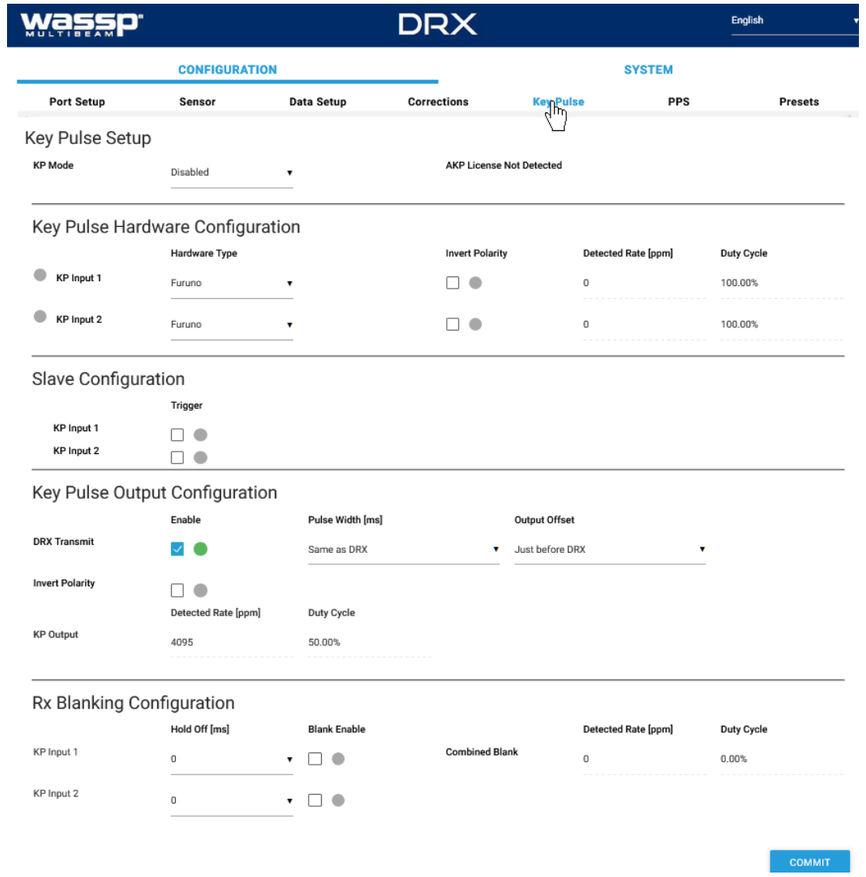


Figure 22. DRX Setup, Key Pulse Tab

Key Pulse can be configured to either be Disabled, Master, Slave or Auto Modes under KEY PULSE SETUP.

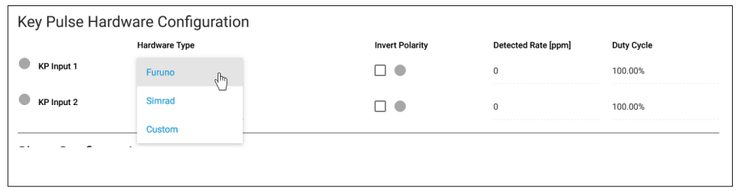
» DISABLED; DRX Tx is not affected by key pulse.
» MASTER; DRX will act as a key pulse Tx master.
» SLAVE; DRX will act as key pulse slave for Tx.
» AUTO; Allows DRX to automatically switch from slave to master with blanking as required.

5.2.6.1. Configuring Key Pulse Slave

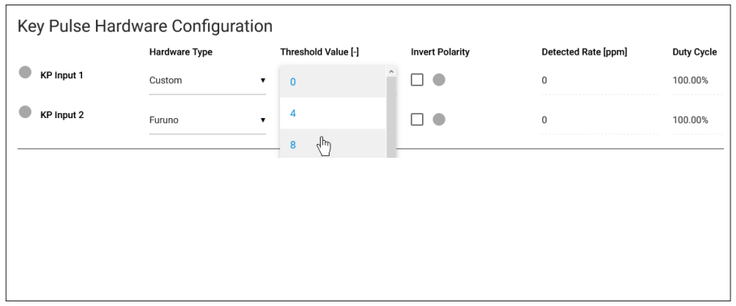
In SLAVE mode the DRX will transmit on the key pulse signal from external equipment. DRX has 2 key pulse inputs available for Slave mode.

To configure Slave mode:

1. Make sure that KEY PULSE SETUP MODE is either SLAVE or AUTO
2. Under KEY PULSE HARDWARE CONFIGURATION select the Hardware type.

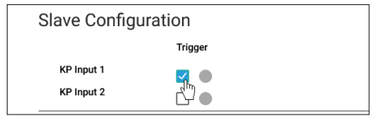


3. If HARDWARE TYPE selected is Custom, set the required trigger threshold level. THRESHOLD VALUE indicates a sensitivity level to the input signal.



4. If the KP signal coming in is inverted select the INVERT POLARITY option.

5. Under SLAVE CONFIGURATION select which key pulse inputs DRX should transmit on. One, both or neither key pulse input can be used.



NOTE: The input signal activity can be indicated using the DETECTED RATE (ppm) and DUTY CYCLE monitors.

5.2.6.2. Configuring Key Pulse Master

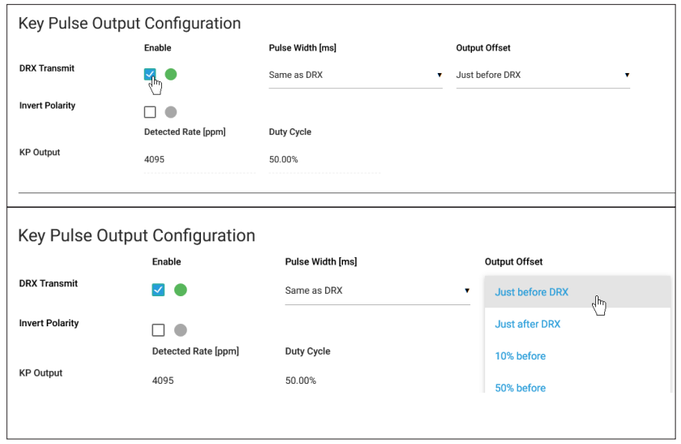
In MASTER mode the DRX will transmit a key pulse signal based off the time of the DRX transmit pulse. Equipment connected to DRX as slaves will transmit relative to this key pulse.

To configure MASTER mode:

1. Make sure that KEY PULSE SETUP mode is set to MASTER.

2. Enable the Key pulse transmit under the KEY PULSE OUTPUT CONFIGURATION.

3. Select time of key pulse relative to DRX transmit time. The % value indicates the relative time between DRX Txs.



NOTE: The output signal activity can be indicated using the DETECTED RATE (ppm) and DUTY CYCLE monitors..

NOTE: Pulse Width is only used for Advanced Key Pulse Setting, described in section *"5.2.6.4. Advanced Key Pulse" on page 43.*

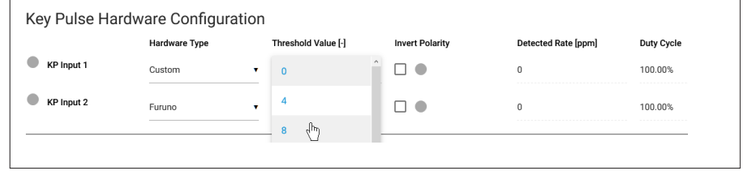
5.2.6.3. Configuring Key Pulse Blanking

Rx Blanking allows any data during the key pulse input period to be blanked out so that potential interference is removed. This blanking will also remove potentially useful acoustic return.

To configure Rx blanking:

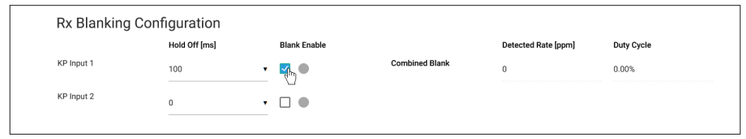
1. Under KEY PULSE HARDWARE CONFIGURATION select the HARDWARE TYPE.

2. If HARDWARE TYPE selected is Custom set the required trigger threshold level.

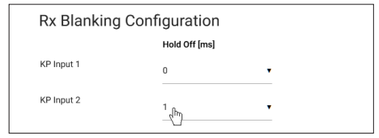


3. If the KP signal coming in is inverted select the INVERT POLARITY option.

4. Enable the blanking using the BLANK ENABLE selections.



5. The blanked region can be offset from the key pulse input signal using the HOLD OFF selection.



NOTE: The input signal activity can be indicated using the signal rate and duty cycle monitors.

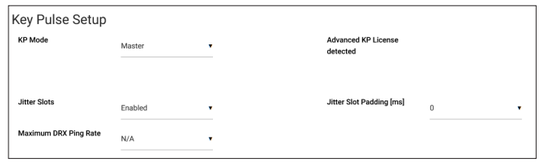
5.2.6.4. Advanced Key Pulse

Advanced key pulse functionality can be enabled by applying the AKP license under SYSTEM FEATURES.

The advanced key pulse functionality includes:

» KP TIMEOUT; If no key pulse is identified over a given period DRX will revert to standard operation.

» JITTER; Jitter can be configured in order to decorrelate transmit while maintaining synchronisation through key pulse operation.



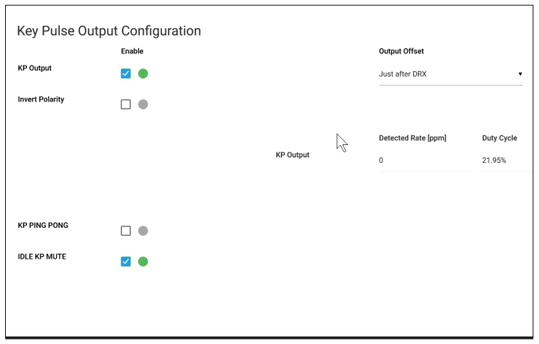
Jitter Slot width for key pulse output is controlled by the PULSE WIDTH SETTING under KEY PULSE OUTPUT CONFIGURATION.

JITTER SLOT PADDING can be used to increase the width of Jitter Slots.

» SLAVE TRIGGER HOLD OFF; Tx can be delayed and staggered relative to the key pulse in.

» PING PONG; This mode forces time division between equipments' full Tx/Rx cycle.

» IDLE KP MUTE: If KEY PULSE OUTPUT is enabled and DRX is not pinging, on timeout key pulse will be output at 250Hz allowing slaved devices to continue running. IDLE KP MUTE selection will disable this mode



.

NOTE: The positive and negative edges of the key pulse output can be used to key two systems that would otherwise interfere with each other. The 2 edges of the key pulse are decorrelated in time.

NOTE: You must select COMMIT to apply these settings.

5.2.7. PPS Tab

PPS input can be configured from the PPS tab.

PPS can be configured for the sensor that is supplying time data as long as that sensor also supports PPS out.

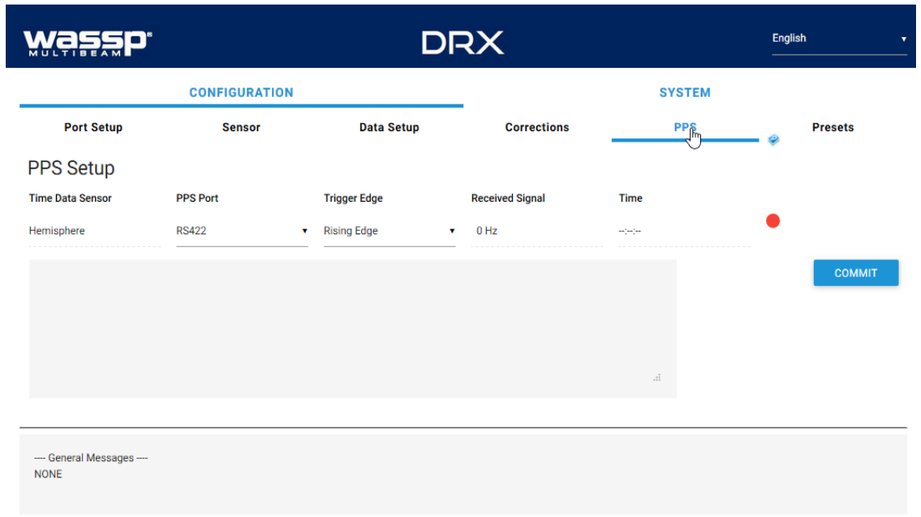


Figure 23. DRX Setup, PPS Tab

The following parameters need to be set:

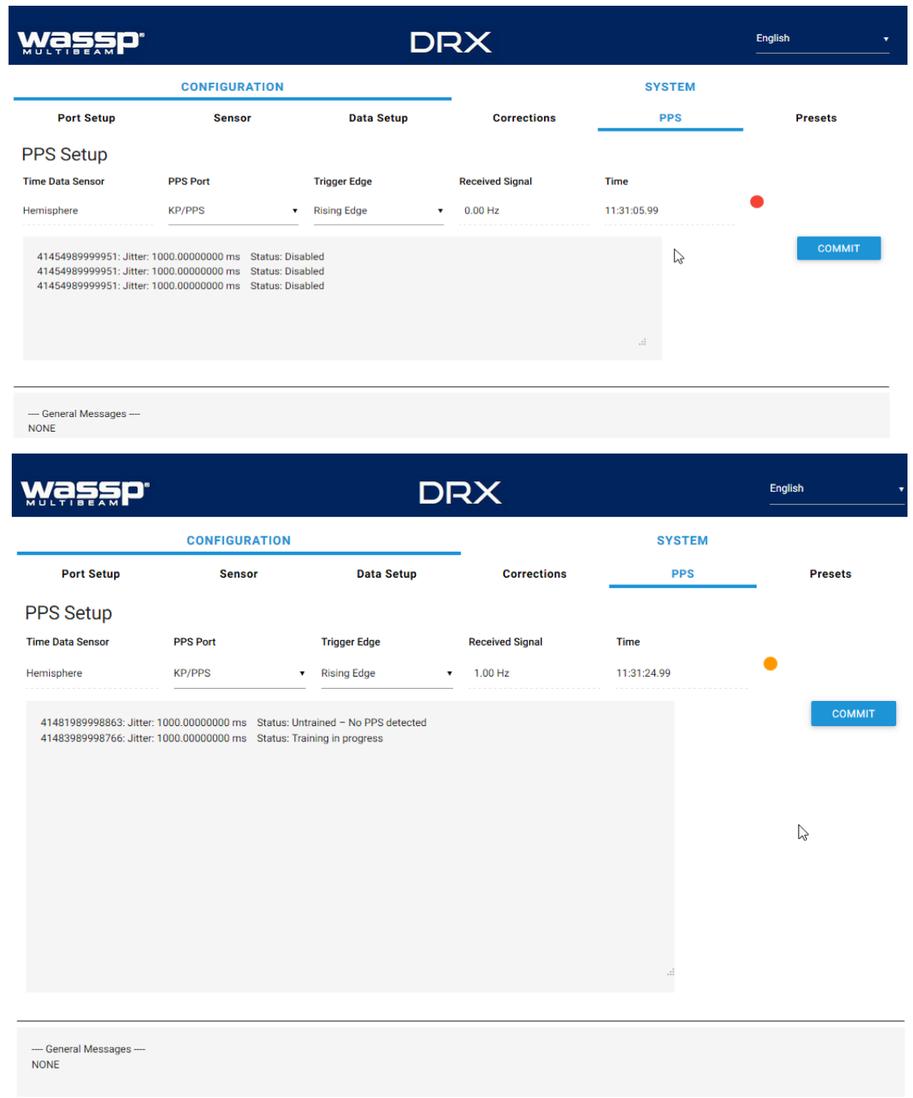
» PPS PORT.

» TRIGGER EDGE; Typically this is rising edge for PPS.

NOTE: The Time data sensor that has been selected under DATA SETUP is indicated under PPS Setup. This needs to correspond with the PPS Port selected.

NOTE: You must COMMIT or these settings will be lost.

With correct configuration TIME will update and status will proceed from Disabled, red indicator, to Training, amber indicator, to synchronised, green indicator, as the following shows:



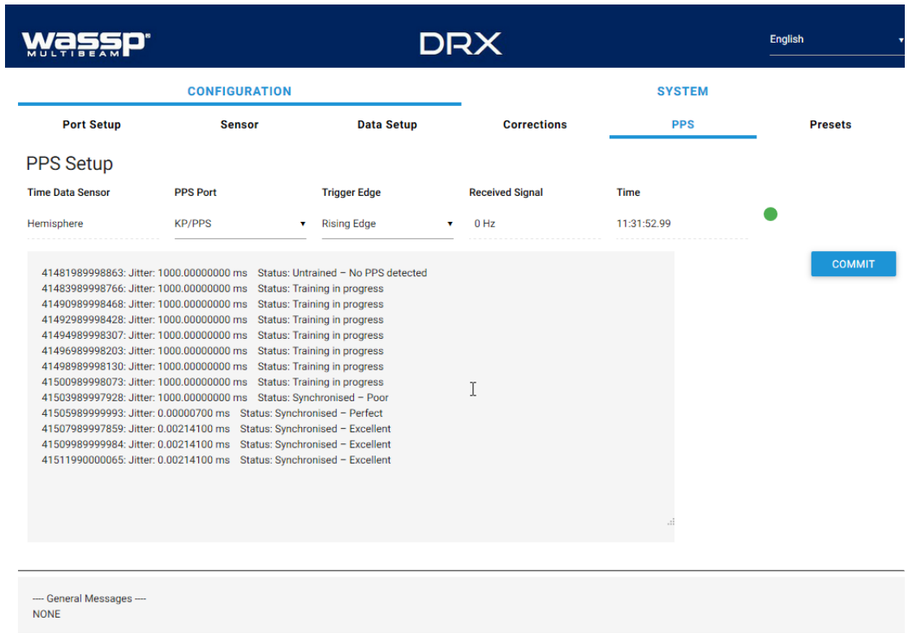


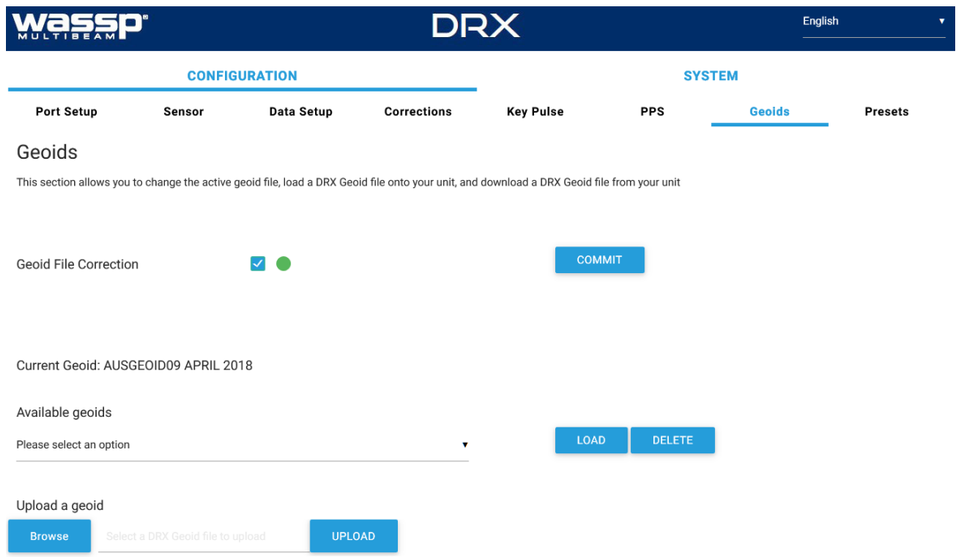
Figure 24. PPS Status

With PPS operating correctly status indicator will remain on green.

5.2.8. Geoids Tab

To use GPS height for calculating sea level in the DRX the GPS should be configured to supply an accurate height fix using Differential or RTK. GGA field 6, GPS Quality Indicator needs to be at 2 or above.

Sea level height can be configured to be relative to the internal GPS Geoid or relative to the Geoid file loaded into the DRX.



5.2.8.1. Configuring Height Relative to the DRX Geoid File

The DRX Geoid file for the appropriate region needs to be uploaded to the DRX. DRX Geoid files are available on request from WASSP Support through the WASSP Support Portal, *see "Appendix E - Product Registration, Support and Resources" on page 89*.

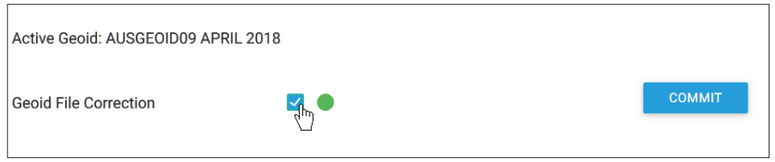
If the required Geoid file is not available a request can be made through the WASSP Support Portal.

To upload a DRX Geoid file:

1. BROWSE and select an appropriate DRX Geoid File.

2. Select UPLOAD to upload the DRX Geiod File to the DRX.
3. Uploaded Geoid files will be available in the AVAILABLE GEOIDS section.
4. Select the applicable Geoid file and select LOAD. This will become the current Geoid used by DRX.

5. Select GEOID FILE CORRECTION and hit COMMIT.



The CURRENT GEOID will now be used for compensating for sea level change or tidal height when correcting the Bathymetry level.

If required an offset can be applied to the Geoid file. This can be applied under the DATA SETUP tab in the DRX SETUP WEBPAGES.

See "Appendix C - Sea Level Height using GPS Height" on page 84, section Sea Level Height using DRX Geoid File for details on the calculated sea height using DRX Geoid File.

5.2.8.2. Configuring Height Relative to the Internal GPS Geoid

The internal GPS Geoid can be used if a DRX Geoid file is not available for your area. Deselect GEOID FILE CORRECTION and hit COMMIT.

An offset can be applied to the Internal GPS Geoid. This can be applied under the DATA SETUP tab in the DRX SETUP WEBPAGES.

See "Appendix C - Sea Level Height using GPS Height" on page 84, Sea section Level Height using Internal GPS Geoid for details on the calculated sea height using Internal GPS Geoid.

5.3. COMMISSIONING STEP 3: ON WATER PATCH TESTS

On water patch tests are essential for correctly configuring the DRX. The accuracy of the values derived from these patch tests will directly impact system performance.

These patch tests can be run using various tools including those in 3rd Party application such as HYPACK, WASSP Patch Test Utility shipped with WASSP CDX or manually through WASSP CDX. The sections below describe methods for running patch tests manually using WASSP CDX.

5.3.1. GPS Time Delay

Most GPS sources used in conjunction with WASSP will have a significant delay between when the ship passes through a position and when that position is sent on the serial port. This delay may be in the order of 1 second. This means at 10 knots an object will move 10 metres if passed in opposite directions at this speed.

IMPORTANT NOTE: NMEA Buffer and multiplexers can add significant delays to serial data. Any configuration change will require recalculation of delays. All connections from sensors should be direct to DRX..

NOTE: If using PPS input to synchronise to UTC time (configured through the DRX SETUP WEBPAGES) the GPS time delay will be automatically accounted for, and the GPS Patch Test is not required.

Test 1: For use with standard GPS

To perform this test, find a distinct feature such as a big rock, sharp slope or cable.

1. Run over the distinct object at SOG (e.g. 5kts).

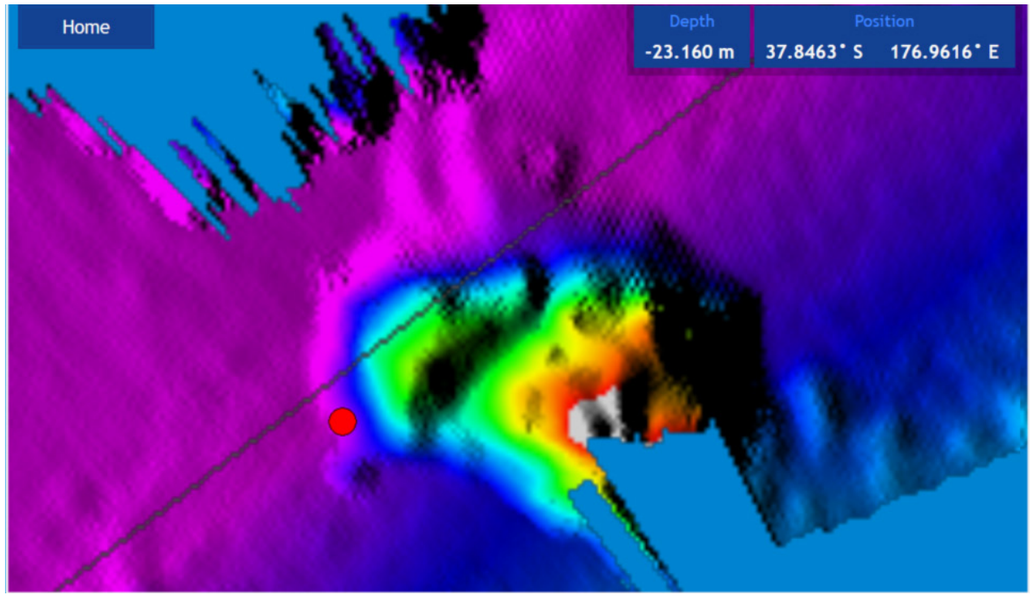


Figure 25. GPS Time Delay Stage 1

2. Run back over object in the opposite direction, same SOG (e.g. 5kts) and drop a mark on the same spot.

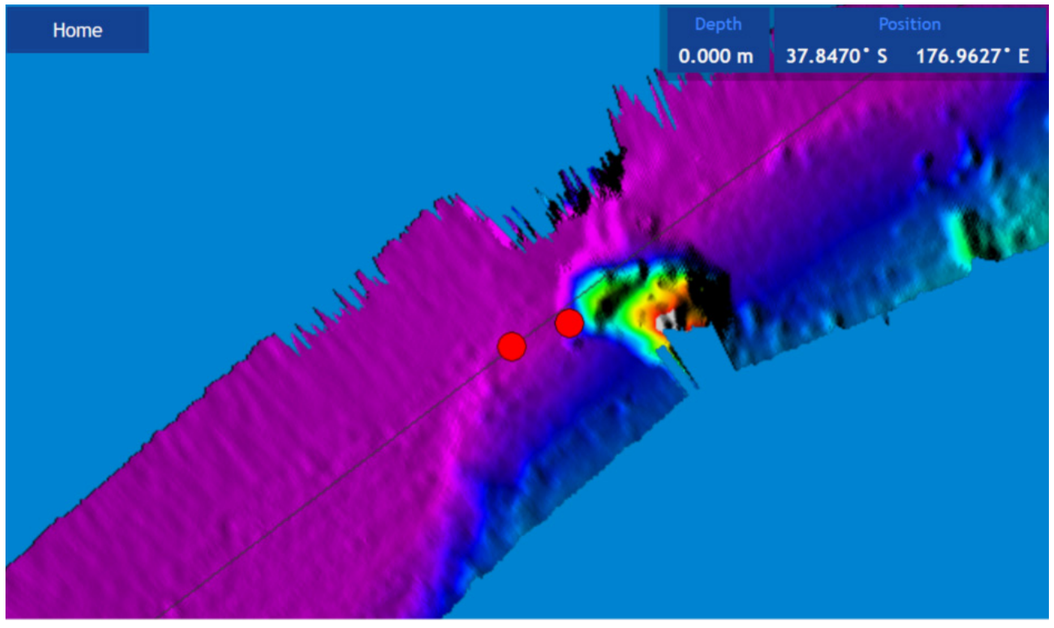


Figure 26. GPS Time Delay Stage 2

3. Use the measure tool to measure the difference between the object's position in the direction the vessel traveled. If the object appears earlier than the previous pass, the time delay is positive.

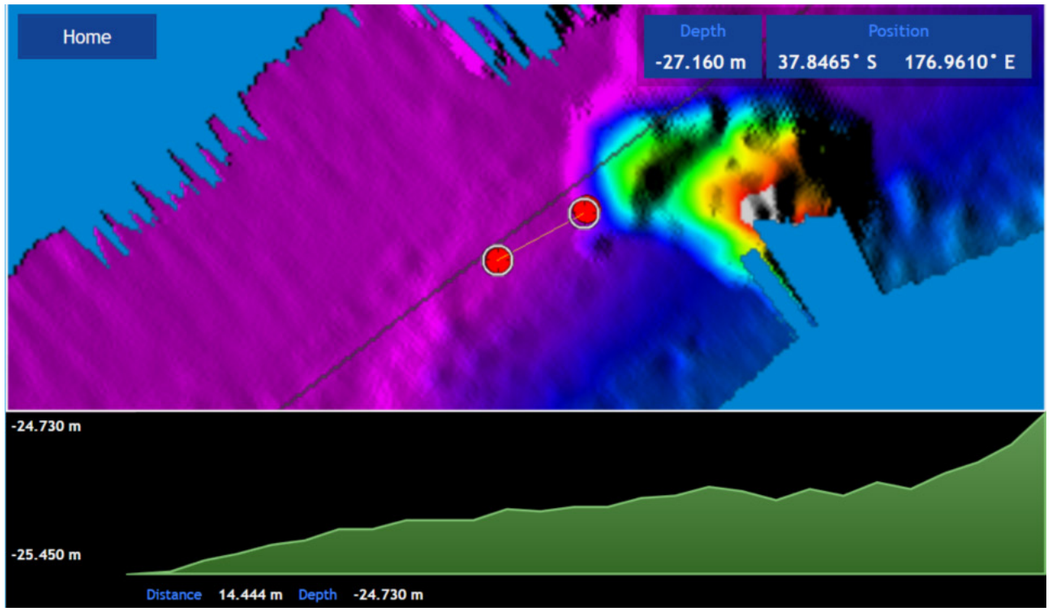


Figure 27. GPS Time Delay Stage 3

The formula below outlines this process.

$$\text{adjustment} = \frac{\text{(- late / + early) change in position in metres}}{\text{speed in knots used in both directions}}$$

4. The delay adjustment is added to the current Time Lag (Sec) value in the DATA SETUP section of the DRX SETUP WEBPAGES. *See "5.2.4. Data Setup Tab" on page 37.*

Test 2: For use with DGPS

The advantage of this approach over the previous test is that it will eliminate pitch errors. However, the displacement of the object will be smaller and this will be difficult to measure accurately as GPS errors can make this impossible.

Approach the distinct feature from the same direction at two vastly different known speeds, as close to zero and at the fastest mapping speed. If the object moves by *delta* metres further along the vessel track (+ve) at a faster speed the adjustment to the time delay will be:

$$\text{adjustment} = \frac{\text{(- late / + early) 2 x } \textit{delta}}{\text{(fast speed in knots) - (slow speed in knots)}}$$

5.3.2. Roll Offset

Before attempting a roll patch test it is suggested that the GPS Time lag and any latencies are accounted for. Also, it is recommended that you conduct a preliminary adjustment of the Sound Speed settings to get things in the correct ballpark. Configure the mapping width to be at the maximum 120° for best results.

The WASSP Patch Test Utility, shipped with CDX, can be used to automatically calculate and apply Roll Offset. Alternatively, Roll Offset can be manually calculated.

Manual Roll Patch Test

1. Use the local chart and local knowledge to identify a spot for the roll patch test – ideally a flat area between 20-40m (shallower than 10m will make it hard to get an accurate reading).

2. Run the ship along a line in direction *A* (it may help to run with the tide and wind behind the vessel as the return journey is the important one).

3. Turn the ship and make a return journey *B* so that the same area is mapped but where the exact opposite heading is used. It may help to use the Heading Up and COG functions.

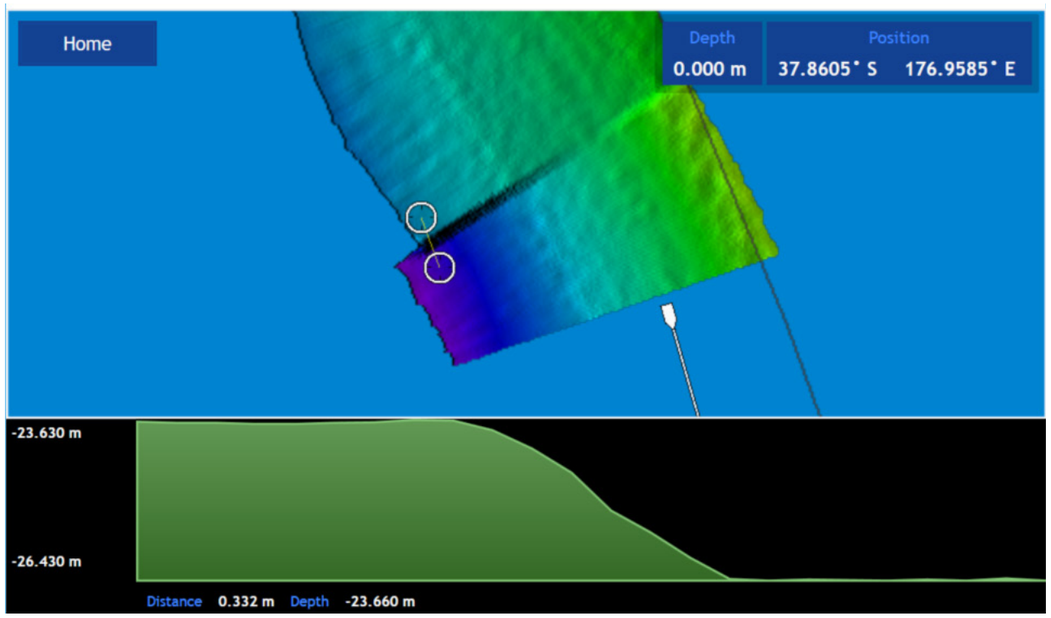


Figure 28. Manual Roll Patch Test

NOTE: Showing path *A* and path *B* overlapping. Measurement D is the change in the depths (2.8m in this case) between the edges of swaths.

4. Use the WASSP CDX Profile tool to measure the depth displacement between the edges of the swath on one side. This value is *D*. It will help to stop pinging while making the measurement so that the swath does not get overwritten.

5. Measure the entire width of the swath at the point you have measured the displacement. This value is *H* (73.229m in this case).

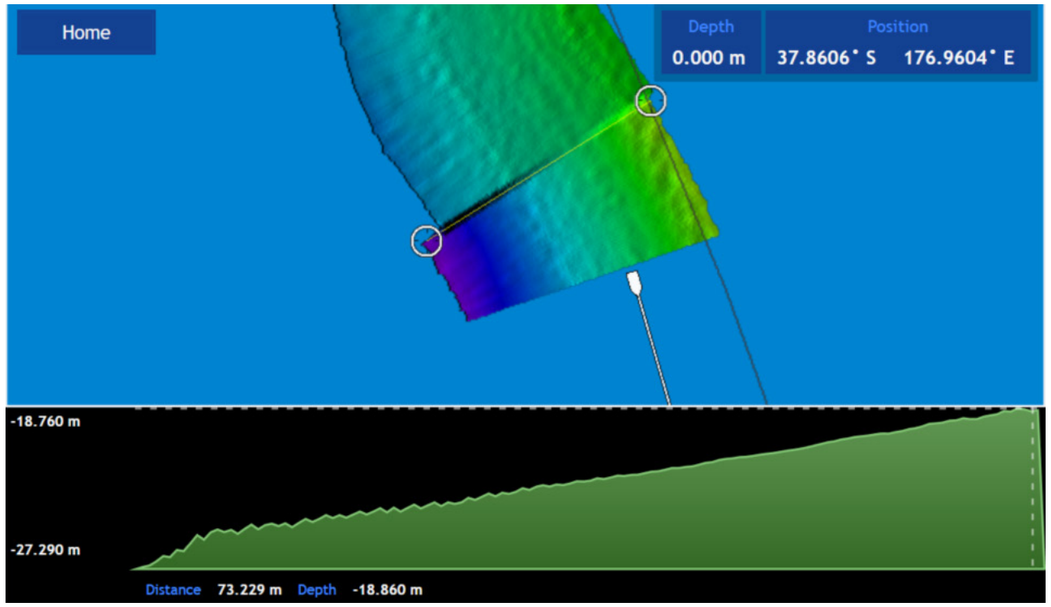


Figure 29. Measurement of Swath Width H

NOTE: the measurement is the distance of the line in this case rather than the depth change – this depth change across the swath is not used.

6. Use a calculator (one is present in Windows) to compute tan(*a*) (*D/H*) e.g.
   a. Run window Calculator, Select 'View: Scientific Mode'
   b. Enter *D* (e.g. 2.8)
   c. Press '/'
   d. Enter *H* (e.g. 73.23m)
   e. Press '='
   f. Select 'Inv'
   g. Press 'tan^{-1}'
   h. Record this number as the Patch Roll Quantity

7. To compute the sign (positive roll or negative roll) of the Roll patch look at the Starboard side-track as journey B is made.
   If this is shallower than track A then the sign for the roll offset is positive. If this is deeper then the depths from track A the sign for the roll offset is negative.

8. Enter the Roll offset value computed into the Roll Offset setting in the DATA SETUP section of the DRX SETUP WEBPAGES. *See "5.2.4. Data Setup Tab" on page 37.*

9. Repeat these steps in a different area, or on a different Mapping database. If there is still a significant difference > 50cm add any difference generated to the Roll offset already computed and then test again. It should be possible to generate a roll offset within 0.1 degrees.

5.3.3. Pitch Offset

If GPS time delay can be completed using variable speed, *See 'Test 2 For use with DGPS' "5.3.1. GPS Time Delay" on page 49* then attempt to compute pitch offset as follows:

Pitch Correction

Requires: >10m depth, Distinct Object, DGPS or better, Accurate Time Lag.

1. Once the Time Lag is accurately ascertained using the variable speed method described in the previous commissioning step, a Pitch Correction value can be ascertained by having the Ship travel over a distinct object in opposite directions.

2. The object will move if the Pitch offset is incorrect and the use of trigonometry will determine the Pitch offset between the Motion Sensor and the Transducer.

3. Enter this number into the Pitch Offset in the DATA SETUP section of the DRX SETUP WEBPAGES. *See "5.2.4. Data Setup Tab" on page 37.*

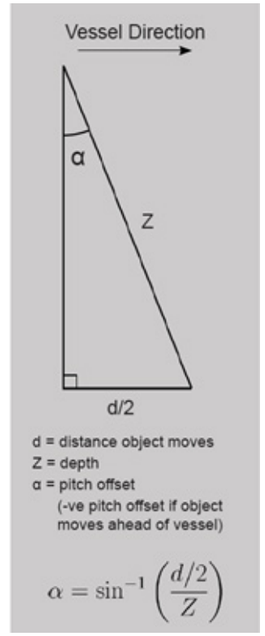


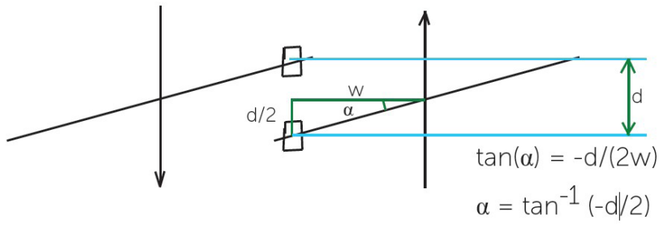
Figure 30. Pitch Corrections

5.3.4. Heading Offset

Requires: DGPS or better, Distinct Object and >10m depth.

To determine an accurate heading correction between the heading sensor and the transducer orientation we need high accuracy position sensors and corrected seafloor data.

1. Approach a small, distinct seafloor feature so that the port side of the swath covers the object.
2. Pass over the object so that the starboard side of the swath crosses the same object in the opposite direction. It is important that these two tracks are on exactly parallel heading lines.
3. Use basic trigonometry to calculate the required heading offset that will allow the object to remain stationary. Redo the heading test to check that the heading offset was entered correctly.



$\tan(\alpha) = -d/(2w)$

$\alpha = \tan\text{-}1\ (-d/2)$

If object moves as above the sign is negated otherwise remove the -ve sign from this equation.

4. Enter the calculated value for *a* into the Heading Offset in the DATA SETUP section of the DRX SETUP WEBPAGES. *See "5.2.4. Data Setup Tab" on page 37.*

5.3.5. Patch Test Validation

With on water patch tests complete the configuration can be checked.

1. Find an area with distinct features such as sand waves, depth variance, rocks etc
2. Map the area with parallel overlapping tracks in both directions.
3. Validate alignment of the features.

Any misalignment will be due to inaccuracies in the commissioning values that have been applied.

6 CONTROL AND DISPLAY APPLICATION SUPPORT

The DRX system is supported by a number of PC and/or Tablet based applications for DRX control and data post processing, data storage and data visualisation.

For detailed operating instruction refer to the applications' appropriate user manual.

Supported applications and connection procedures are outlined here.

NOTE: DRX SDK and API with integration instructions are available from WASSP Ltd.

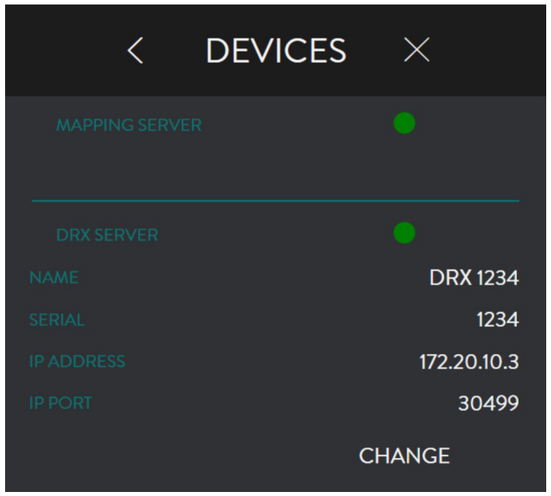
6.1. CONNECTING THE WASSP CDX TO THE DRX

WASSP CDX ships free with DRX and can be installed directly from the USB Flash Drive.

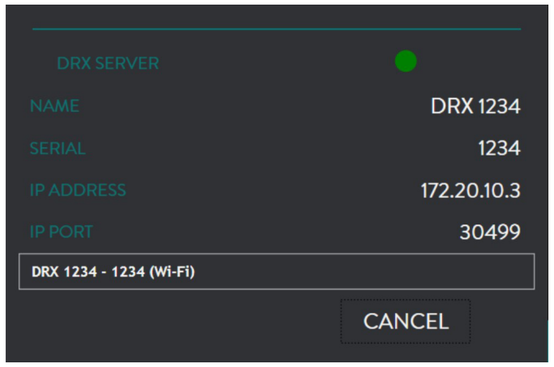
1. After installing WASSP CDX on your PC, start the DRX and run WASSP CDX.
2. WASSP CDX will automatically select the DRX as long as the network has been correctly configured.
3. To manually select the DRX you wish to connect to:

Open the HOME menu and select DEVICES.

NOTE: Navigation to DEVICES will depend on CDX version.



4. The DEVICES 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 light will display the following depending on the current status of the connection:

   » GREEN: Connected
   » AMBER: Connection is being changed
   » RED: No Connection

NOTE: Refer to WASSP CDX Operators Manual for more details.

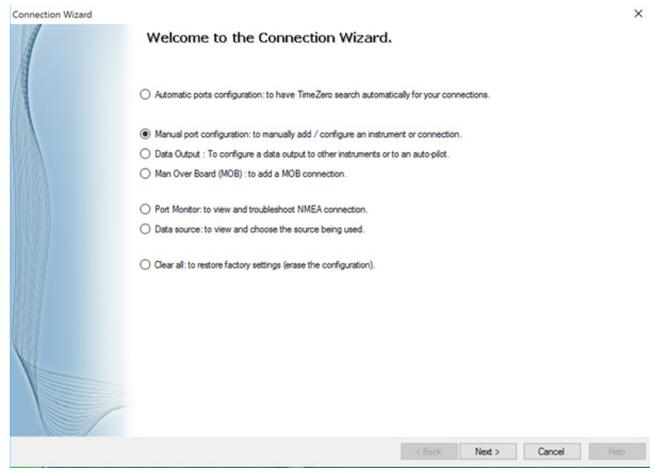
6.2. CONNECTING MAXSEA TIMEZERO PLOT TO THE DRX

TimeZero Plot needs to be purchased from Maxsea, see http://www.maxsea.com/products/software

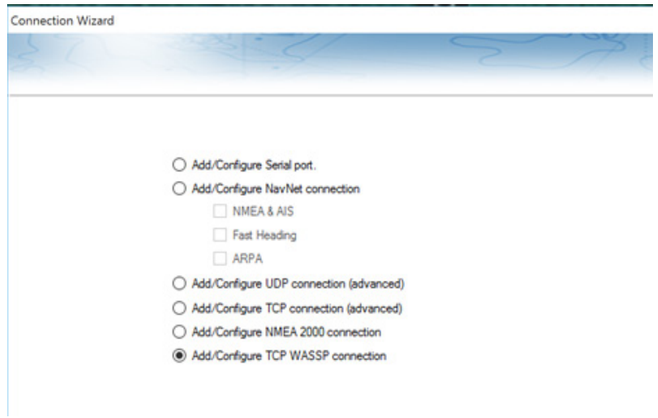
After installing the TZ Professional software on your PC, start the configured DRX and ensure that all connected sensors are on and sending data.

1. Open the CONNECTION WIZARD.

2. Select 'Manual Port Configuration' and press the NEXT button.



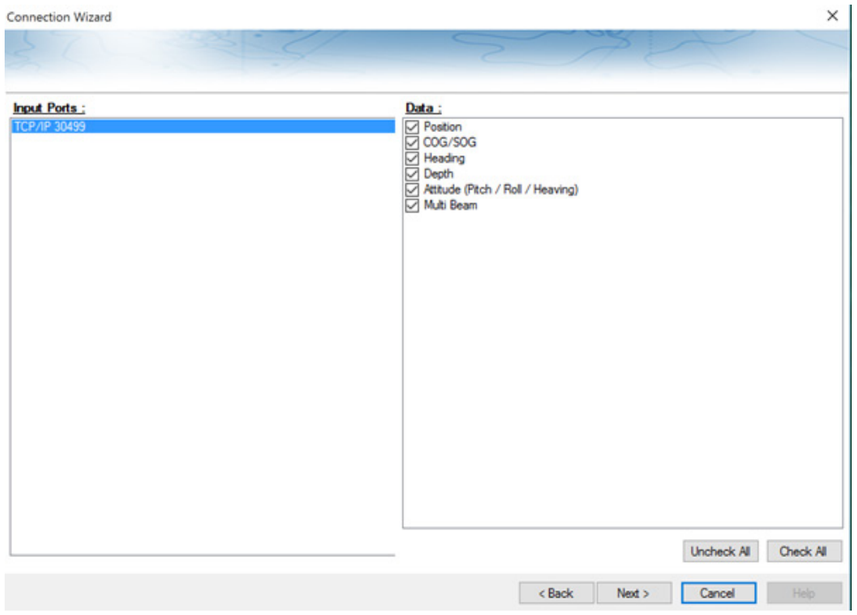
3. Select 'Add/ Configure TCP WASSP Connection'.



4. Enter in the IP address of the DRX and the TCP port (default is 55555).

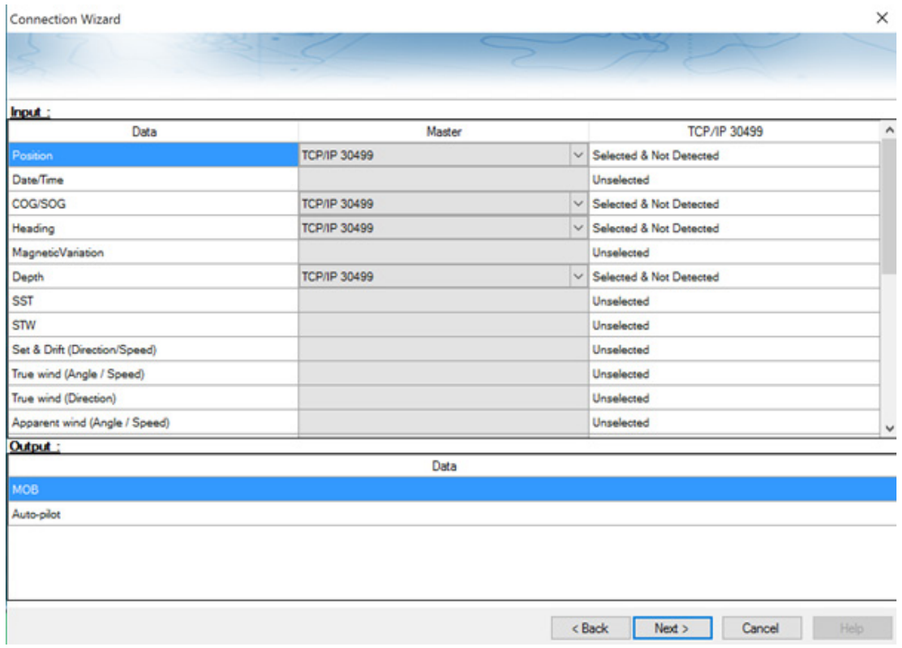
NOTE: If you don't know the IP address of the DRX, use the 'Find My DRX' app to locate it.

5. The TZ Professional software should find all the data being output from the DRX. If not, recheck your network settings.



6. Select your desired sources for each connected sensor.

NOTE: Navigation sources can be different from the DRX, but this may make installation simpler to use the DRX as the primary source.



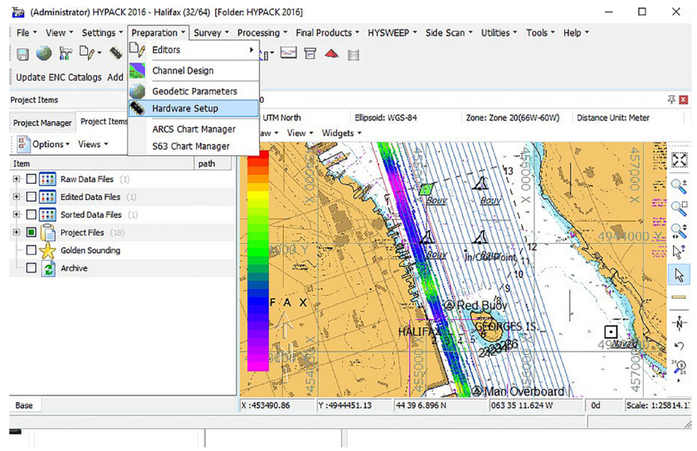
7. To begin logging on to TZ Professional software, ensure that PBG icon is enabled.

6.3. CONNECTING HYPACK TO THE DRX

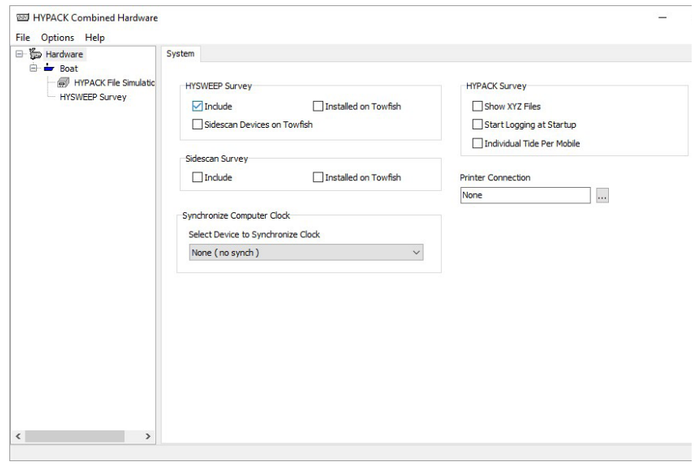
HYPACK needs to be purchased from your local HYPACK dealer. See www.hypack.com for details.

Install HYPACK 2016A or later. Refer to HYPACK manual for details.

1. Go to PREPARATION and select HARDWARE SETUP.



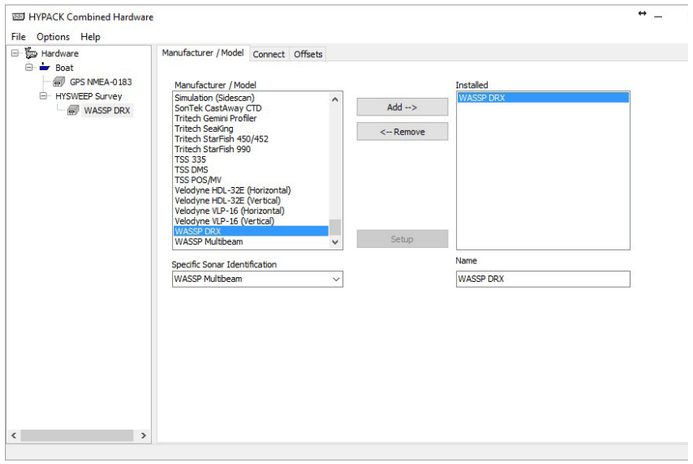
2. INCLUDE HYSWEEP Survey.



NOTE: All GPS and sensor data should be connected to the DRX.
DRX supplies all required data to HYPACK over the ethernet link.

NOTE: Refer to Knowledge Base for guidelines on system configuration with HYPACK. *See "Appendix E - Product Registration, Support and Resources" on page 89.*

3. Select HYSWEEP SURVEY in the tree on the left.

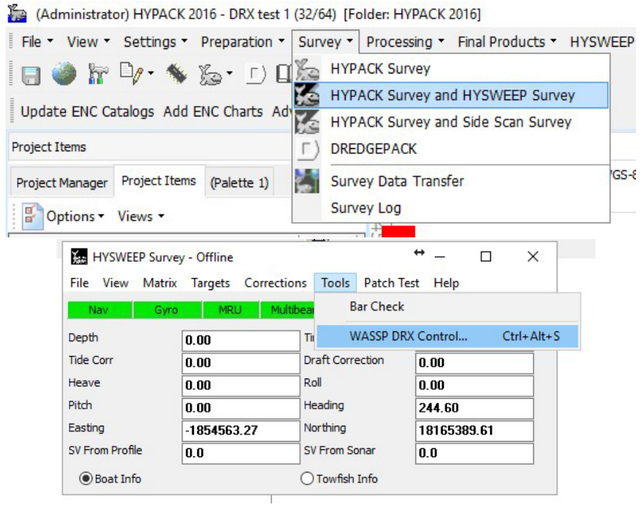


4. Then select WASSP DRX.

5. Select ADD (WASSP DRX will now be in the list of Installed devices).

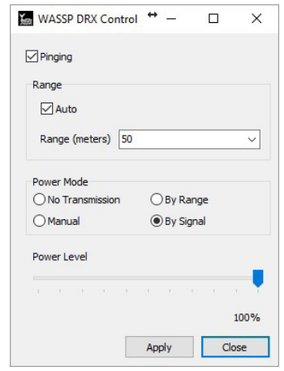
6. Close HYPACK Combined Hardware and save changes.

7. Select SURVEY in the menu.



8. Select HYPACK SURVEY AND HYSWEEP SURVEY.

9. Once connection is established DRX control can be performed through the WASSP DRX CONTROL accessed from HYSWEEP TOOLS menu.



NOTE: Offsets recorded under *"5.1. Commissioning Step 1: Ship Measurements" on page 32* need to be applied in HYPACK directly.

7 OUTLINE DRAWINGS

7.1. DRX-32 OUTLINE DRAWINGS

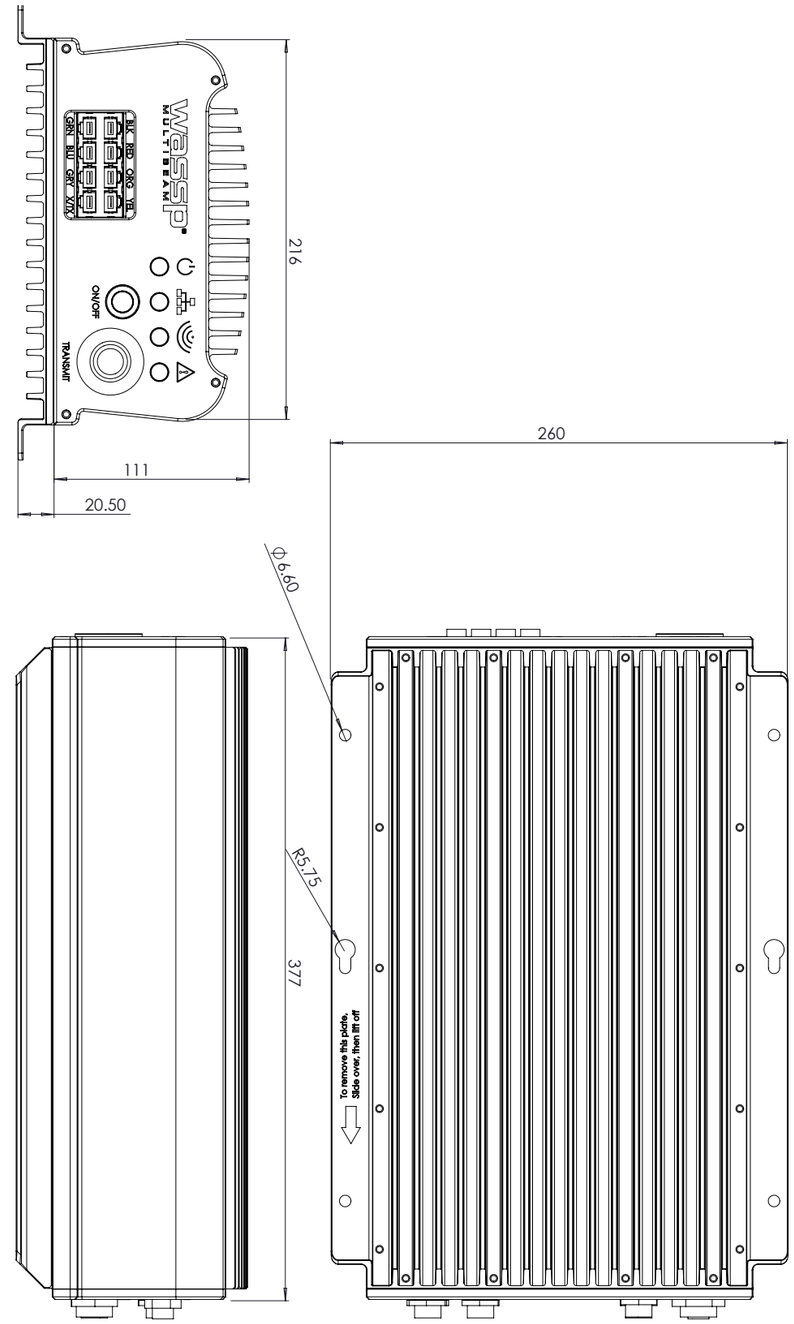


Figure 31. DRX-32 Dimensions

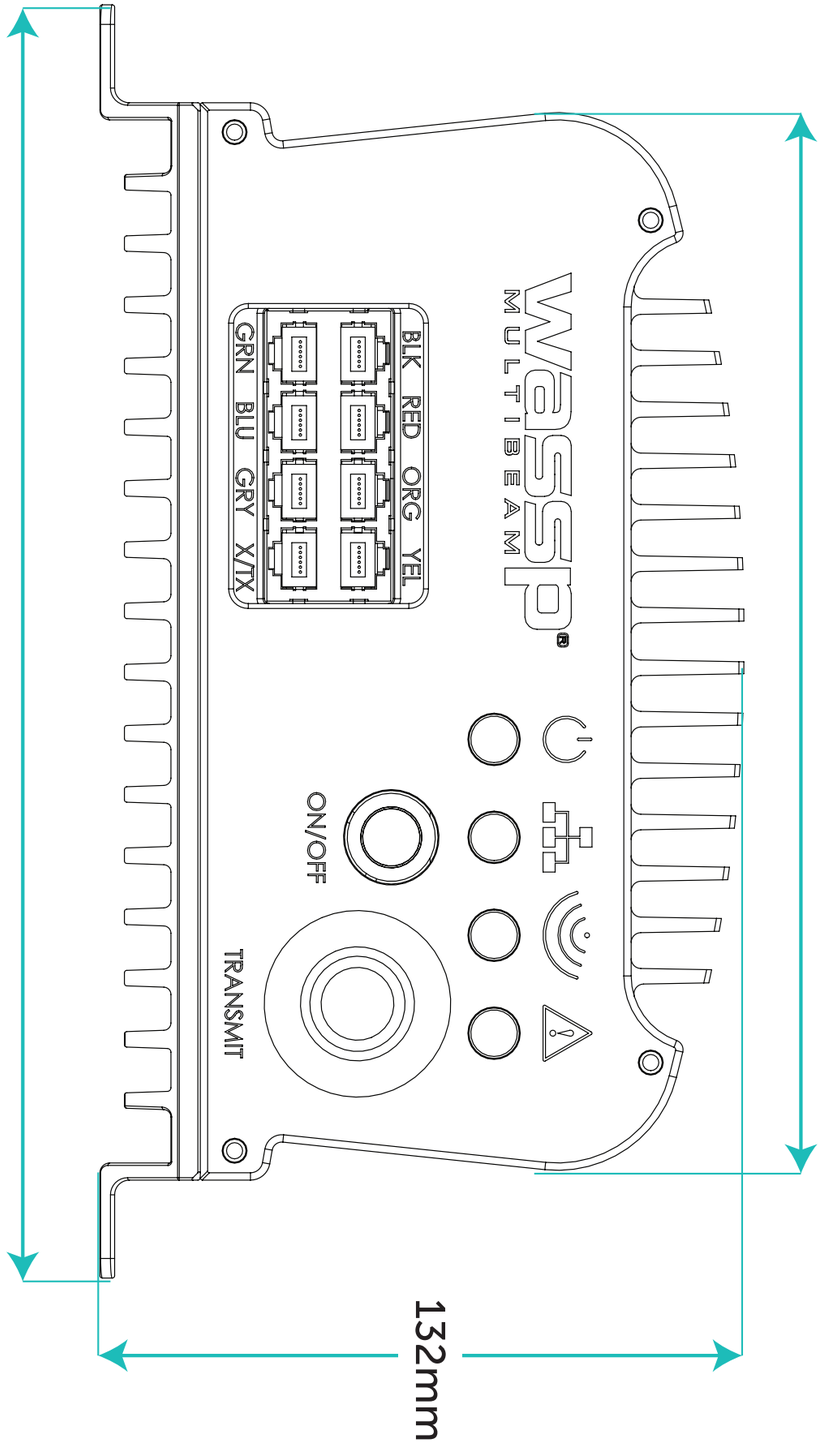


Figure 32. DRX-32 Front Plate Dimensions

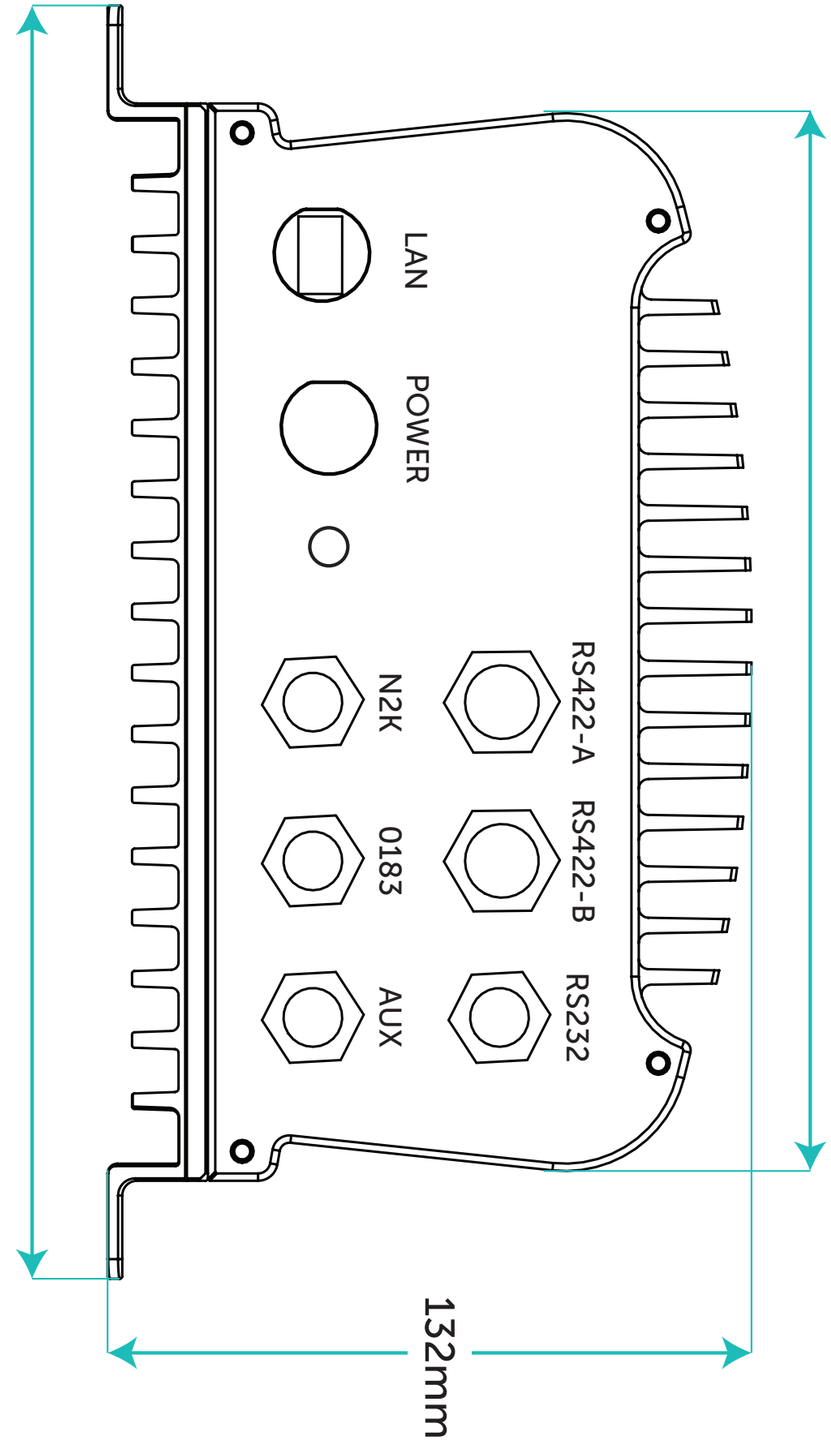


Figure 33. DRX-32 Back Plate Dimensions

7.2. DRX-46 OUTLINE DRAWINGS

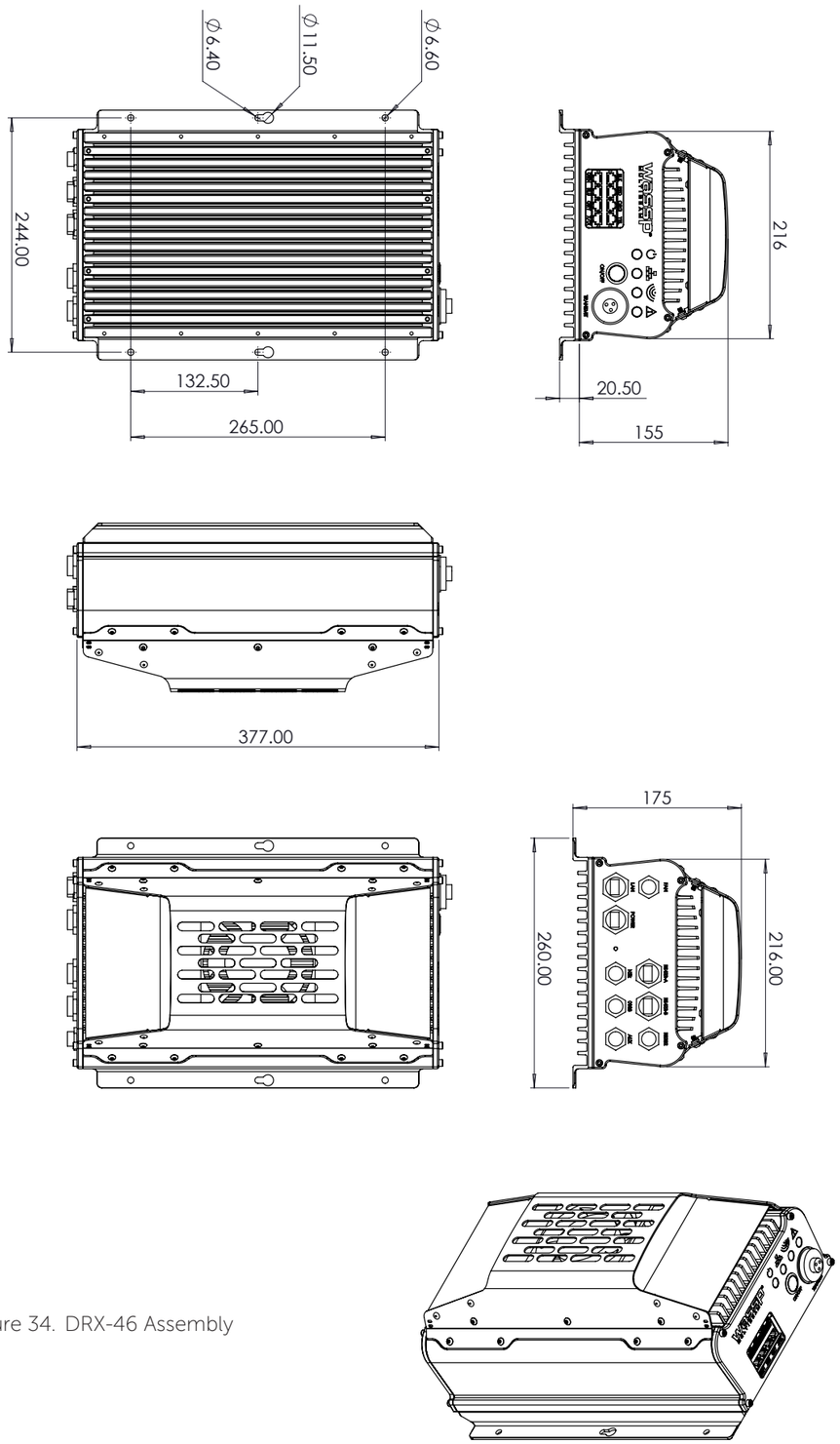


Figure 34. DRX-46 Assembly

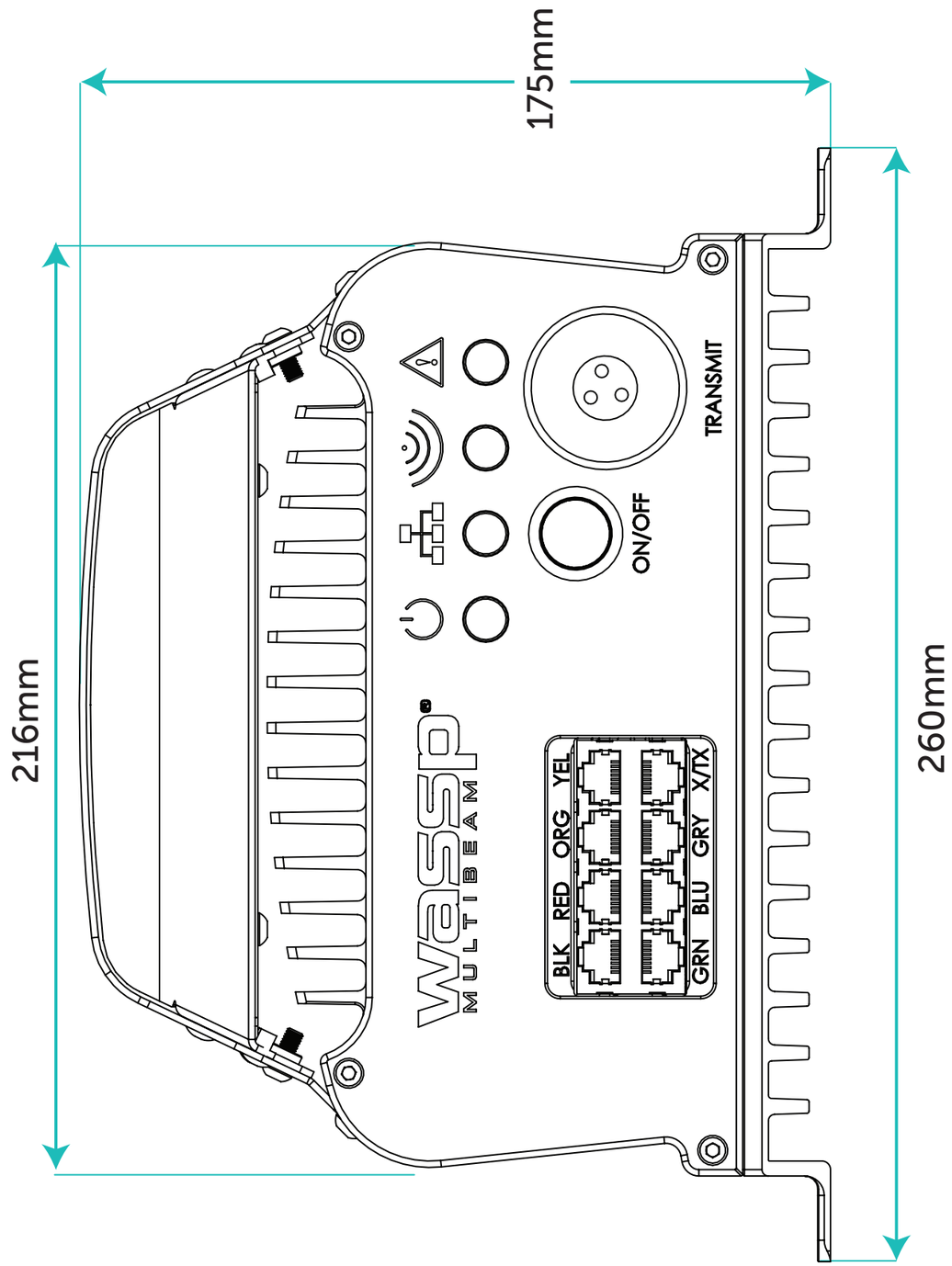


Figure 35. DRX-46 Front Plate Dimensions

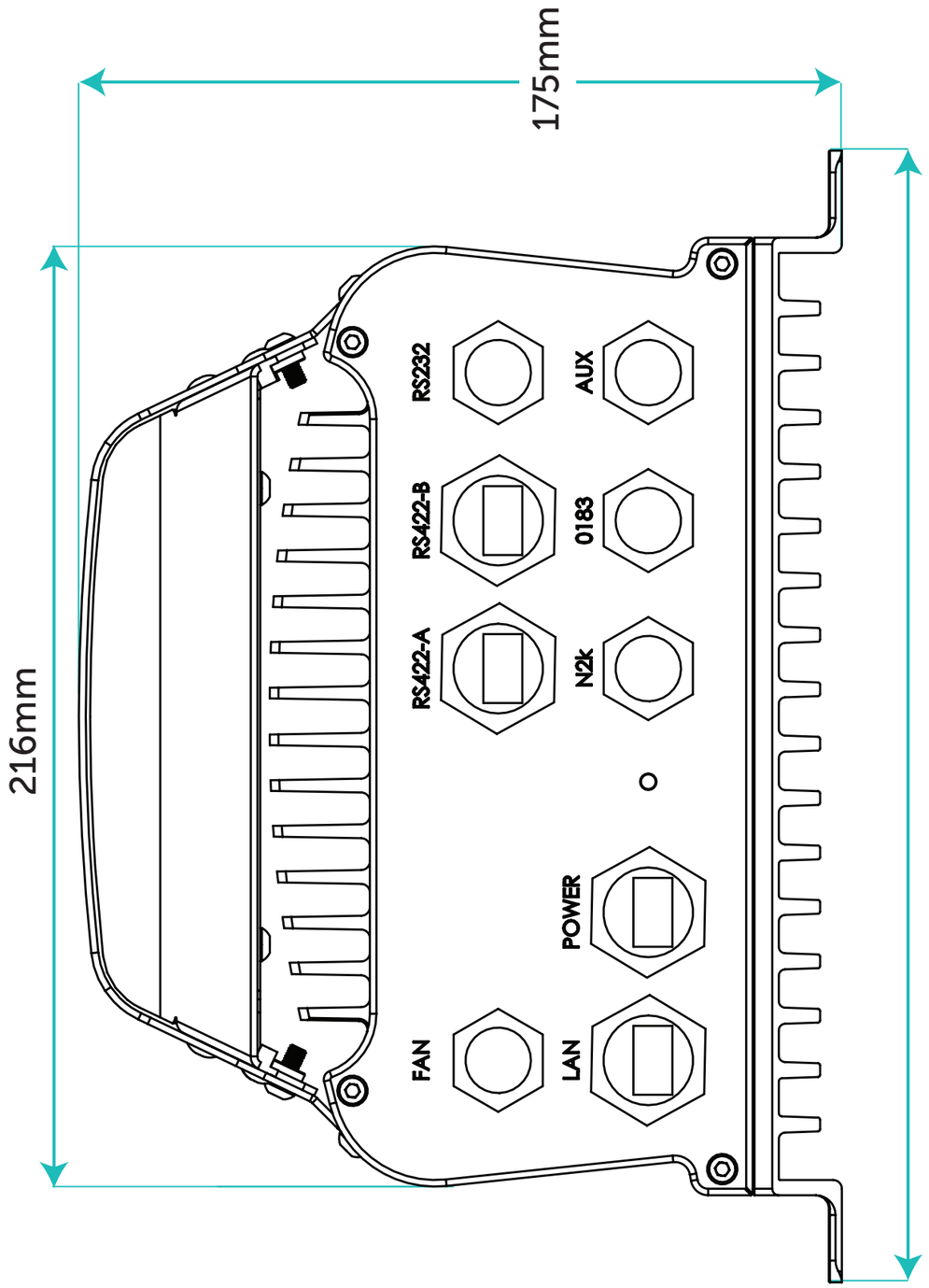


Figure 36. DRX-46 Back Plate Dimensions

8 DRX INTERCONNECTION

8.1. DRX-32 INTERCONNECTION

LAN

	1	TD_P
	2	TD_N
	3	RD_P
	4	NC
	5	NC
	6	RD_N
	7	NC
	8	NC

POWER

WHITE	1	DC +VE
BLACK	2	DC -VE

N2K

BARE	1	SHIELD
RED	2	NET S
BLACK	3	NET C
WHITE	4	NET-H
BLUE	5	NET-L

0183

BLACK	1	NMEA0183 IN-A/+
BROWN	2	NMEA0183 IN-B/-
WHITE	3	NMEA0183 OUT-A/+
BLUE	4	NMEA0183 OUT-B/-
RED	5	GND (SHIELD)
GREY	6	PPS_IN
YELLOW	7	PPS_IN GND
GREEN	8	NC

AUX

	1	KP1_IN
	2	KP1_IN_GND
	3	KP2_IN
	4	KP2_IN_GND
	5	KP1_OUT
	6	+5.5V Isolated
	7	GND(5.5V,KPI_OUT)
	8	REMOTE_PWR_ON
	9	REMOTE_PWR_ON_GND
	10	NC

RS422-A

BROWN	1	PPS (AUX)
BLUE	2	RxD A/+
WHITE	3	RxD B/-
GREEN	4	TxD A/+
YELLOW	5	TxD B/-
GREY	6	GND
	7	NC
	8	9-32V+
	9	9-32V-

RS422-B

	1	PPS (AUX)
	2	RxD A/+
	3	RxD B/-
	4	TxD A/+
	5	TxD B/-
	6	GND
	7	RESERVED
	8	RESERVED
	9	RESERVED
	10	RESERVED
	11	9-32V-
	12	9-32V+

RS232

BLUE	1	RS232_TX
GREEN	2	RS232_RX
YELLOW	3	RS232_GND
BLACK	4	NC
RED	5	9-32V+
WHITE	6	9-32V-

Figure 37. DRX-32 Interconnection Diagram

8.2. DRX-46 INTERCONNECTION

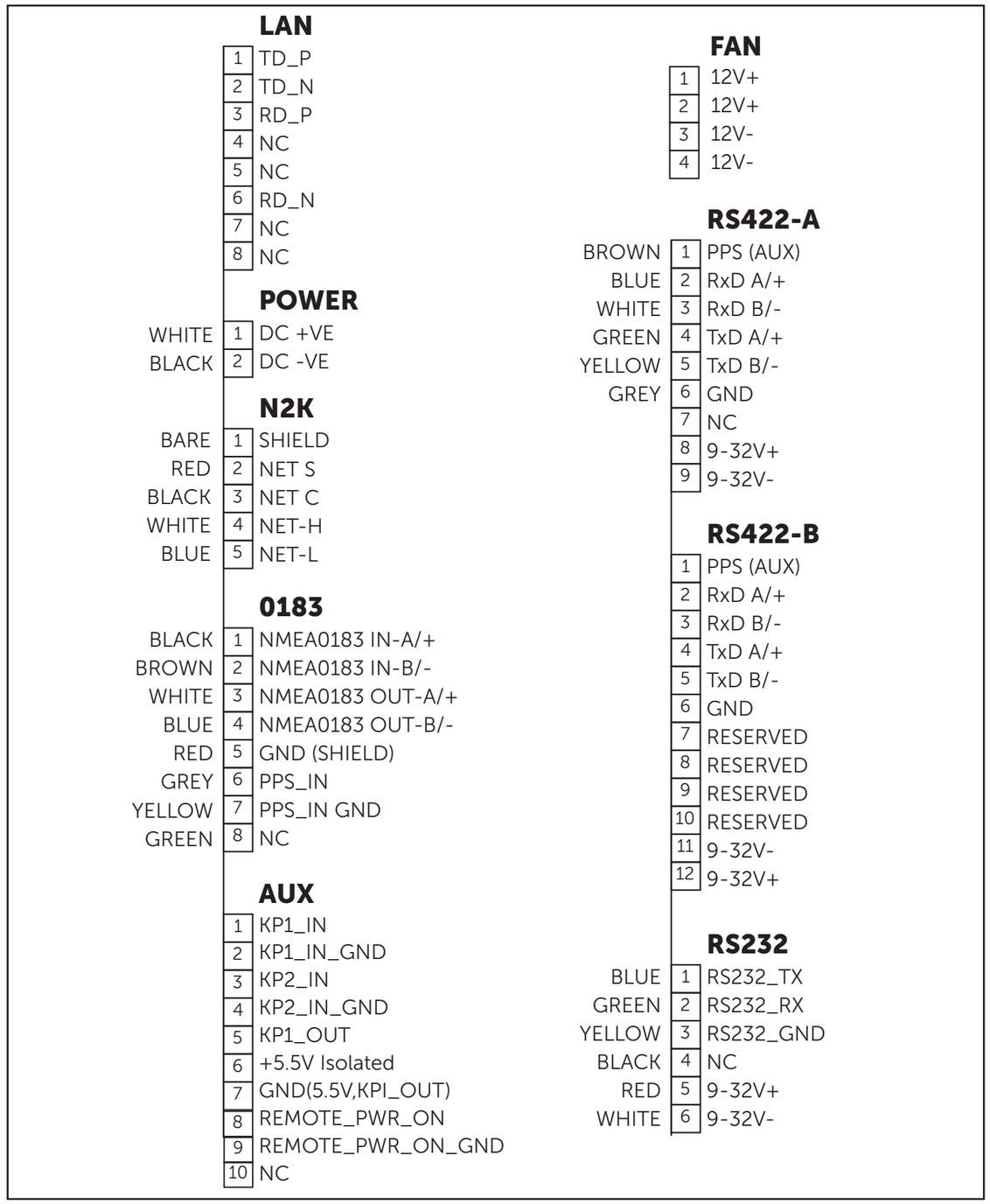


Figure 38. DRX-46 Interconnection Diagram

9 TECHNICAL SPECIFICATIONS

DRX Spec Sheet

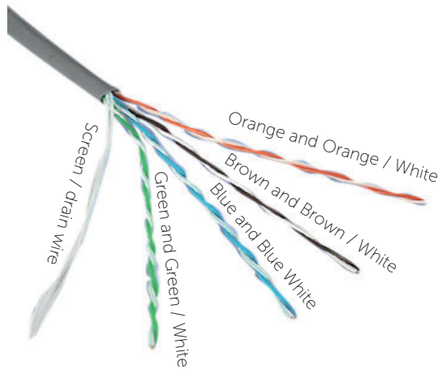
System	
- Frequency	Variable, Wideband, Transducer Dependent
- Signal Type	DRX-32, WSP-603-20X; FM DRX-46, WSP-603-25X; FM/CW
- Tx Type	DRX-32, WSP-603-20X; Full Digital DRX-46, WSP-603-25X; Digital
- Ping Rate	Automatic, depth determined; Maximum 50Hz
- Depth Range	Transducer and environmental dependent. Nominally: DRX-32, WSP-603-20X; 1-200m (WMB160). 2-450m (WMB80) DRX-46, WSP-603-25X; 1-400m (WMB160). 2-600m (WMB80)
-Range Resolution	Maximum 2cm
I/O Interface	
- Ethernet	GbE
- Serial	RS-232, RS-422 x 2 (model dependent), NMEA 0183
- CAN	NMEA 2K
- Analog	KP in x2, KP out, PPS
- Other	Remote Power Control, Fan Power out 12V x2 (model dependent)
Data Formats	
- Input Sentences	*See "Appendix B - Supported Sensors and Sentences" on page 82*
- Output Sentences	*See "Appendix B - Supported Sensors and Sentences" on page 82*
- Output Data types	See WASSP DRX ICD (Interface documentation for DRX and associated DRX SDK/API documentation)
Power	
- Power Supply	DC Input DRX-32, WSP-603-20X; 9-32V DC DRX-46, WSP-603-25X; 18-32V DC
- Power Consumption (max)	DRX-32, WSP-603-20X; 30W DRX-46, WSP-603-25X; 50W
Mechanical	
- Dimensions	DRX-32, WSP-603-20X; DRX377mm(L) x 260mm(W) x 132mm (H) DRX-46, WSP-603-25X; DRX377mm(L) x 260mm(W) x 175mm (H)
- Weight	DRX-32, WSP-603-20X; 8.3kg DRX-46, WSP-603-25X; 9.5kg
- Mounting	Bulkhead or Flat
Environmental	
- Operating Temperature	DRX-32, WSP-603-20X; 0°C to 50°C DRX-46, WSP-603-25X; 0°C to 40°C
- Storage Temperature	-20°C to 85°C
- Ingress/Water Impact*	IP53, Bulkhead Mounted
- Humidity/Damp Heat	IEC60945 +40°C 93 % relative humidity
- Vibration	DRX-32, WSP-603-20X; "IEC60945 Sweep 2 Hz – 13,2 Hz at ± 1 mm, 13,2 Hz – 100 Hz at 7 m/s2 and for 2 h on each resonance, otherwise 2 h at 30 Hz in all three axes"
- Shock	DRX-32, WSP-603-20X; MIL-STD-901, Grade B, Class II
- EMC	IEC60945

*Extended ingress rating to IP67 available; model WSP-603-205

10 APPENDIX

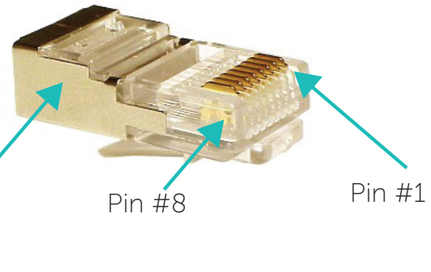
APPENDIX A - CABLE DRAWINGS

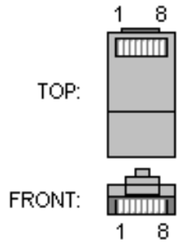
APPENDIX A.1 TRANSDUCER RX



The CAT5E cables used in the transducer cable follow standard CAT5 colour codes but the RJ-45 plug wiring is specific to the DRX and does NOT conform to T568A or B.

RJ-45 Plug Pin Number	CAT 5 conductor colour
1	Orange
2	Orange / White
3	Green
4	Green / White
5	Blue
6	Blue / White
7	Brown
8	Brown / White
Case	Screen / drain wire (solder)

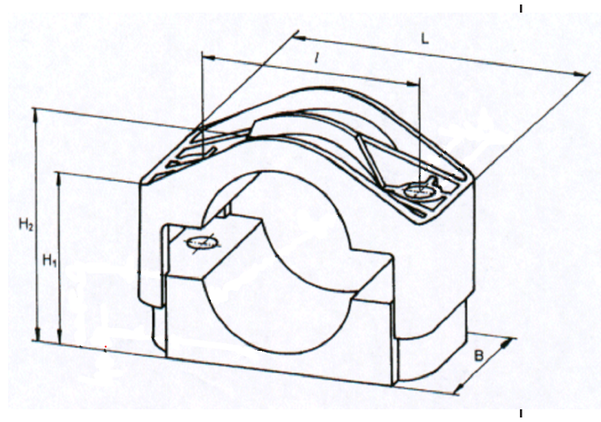




The screen / drain wire should be soldered on to the side of the RJ-45 connector. Scratch the side of the connector with something sharp before soldering to assist with the join.

APPENDIX A.2 TRANSDUCER CABLE RESTRAINER

The supplied cable restrainer must be fitted to ensure that transducer connections are not damaged due to strain from the transducer cable. Ensure that when mounted there is still room to remove the cables from the DRX for servicing.



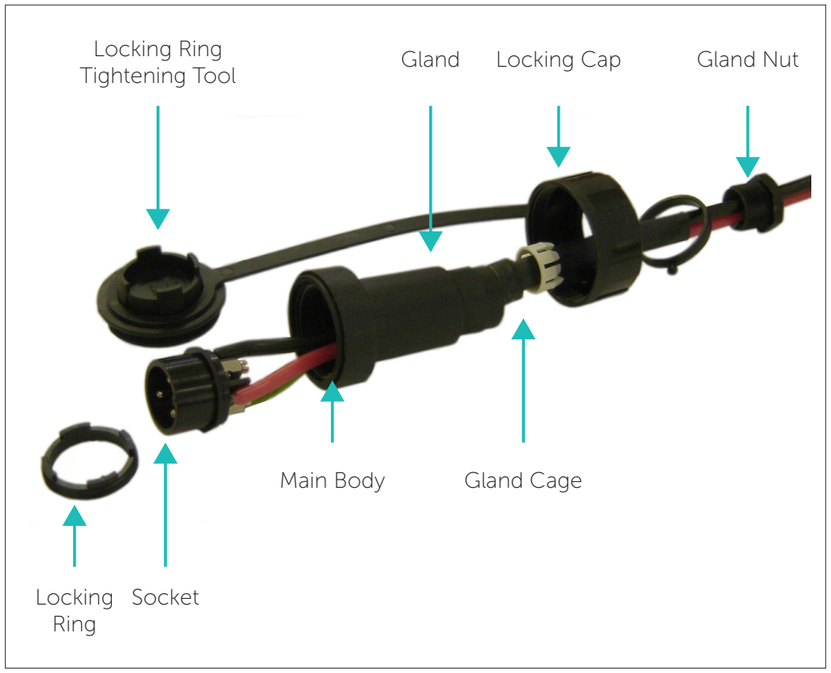
APPENDIX A.3 TRANSDUCER TX

Transmitter Cable Socket Assembly

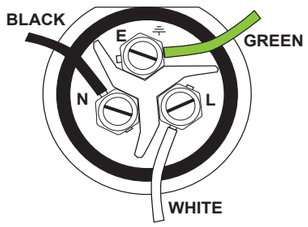
If the transmitter cable socket needs to be disassembled, use the locking ring tightening tool (supplied with the DRX) to loosen the locking ring. To assemble the 3-pin sealed plug:

Push the following parts over the transmitter wires:

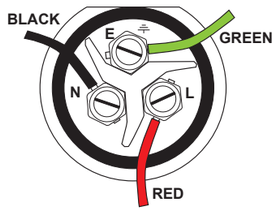
- Gland Nut
- Gland Cage
- Gland
- Main Body



1. Attach the RED or WHITE wire to L, the BLACK wire to N, and the GREEN wire to E on the socket and tighten all three screws.

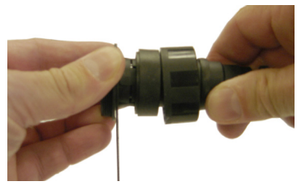


Later Cable Colour Code



Early Cable Colour Code

2. Push the socket into the main body, making sure that the flat on the socket locates into the flat on the main body.
3. Using the tightening tool, screw the locking ring into the front of the socket until tight.
4. Push the gland, gland cage, and gland nut into the main body as far as it will go and tighten the nut securely.

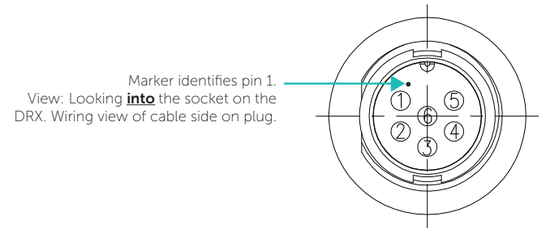


Tightening tool

APPENDIX A.4 RS-232

Connector **RS-232**

PIN	Function
1	RS-232_TX
2	RS-232_RX
3	RS-232_GND
4	
5	9-32V+
6	9-32V-



Example Connection:

1	RS-232_TX	→	RS-232_TX
2	RS-232_RX	→	RS-232_RX
3	RS-232_GND	→	RS-232_GND
4			
5	9-32V+		
6	9-32V-		

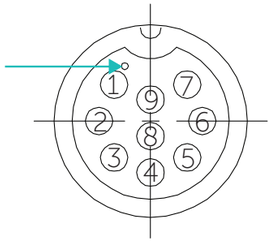
» Isolation; Fully electrically isolated.
» Cable; Multi core or multi core screened with tinned copper conductors.

APPENDIX A.5 RS-422-A

Connector **RS422-A**

PIN	Function
1	PPS (AUX)
2	RxD A/+
3	RxD B/-
4	TxD A/+
5	TxD B/-
6	GND
7	
8	9-32V+
9	9-32V-

Marker identifies pin 1.
View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	PPS (AUX)	←	PPS OUT
2	RxD A/+	←	TxD A/+
3	RxD B/-	←	TxD B/-
4	TxD A/+	→	RxD A/+
5	TxD B/-	→	RxD B/-
6	GND	←	PPS OUT GND
7			
8	9-32V+		
9	9-32V-		

- » Isolation; Fully electrically isolated.
- » Cable; Multi core screened with tinned copper conductors.
- » Shield; Should be connected at far end.

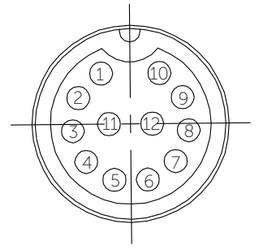
NOTE: Depending on sensor compliance, this may be used as direct NMEA 0183 input.

APPENDIX A.6 RS-422-B

Connector **RS422-B**

PIN	Function
1	PPS (AUX)
2	RxD A/+
3	RxD B/-
4	TxD A/+
5	TxD B/-
6	GND
7	RESERVED
8	RESERVED
9	RESERVED
10	RESERVED
11	9-32V-
12	9-32V+

View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	PPS (AUX)	←	PPS OUT
2	RxD A/+	←	TxD A/+
3	RxD B/-	←	TxD B/-
4	TxD A/+	→	RxD A/+
5	TxD B/-	→	RxD B/-
6	GND	←	PPS OUT GND
7	RESERVED		
8	RESERVED		
9	RESERVED		
10	RESERVED		
11	9-32V-		
12	9-32V+		

- » Isolation; Fully electrically isolated.
- » Cable; Multi core screened with tinned copper conductors.
- » Shield; Should be connected at far end.

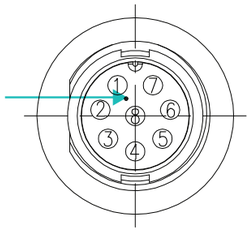
NOTE: Depending on sensor compliance, this may be used as direct NMEA 0183 input.

APPENDIX A.7 NMEA 0183

Connector **0183**

PIN	Function
1	NMEA0183 IN A/+
2	NMEA0183 IN B/-
3	NMEA0183 OUT A/+
4	NMEA0183 OUT B/-
5	GND (Shield)
6	PPS_in
7	PPS_in GND
8	

Marker identifies pin 1.
View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	NMEA0183 IN A/+		NMEA0183 IN A/+
2	NMEA0183 IN B/-		NMEA0183 IN B/-
3	NMEA0183 OUT A/+		NMEA0183 OUT A/+
4	NMEA0183 OUT B/-		NMEA0183 OUT B/-
5	GND (Shield)		PPS OUT +
6	PPS_in		PPS OUT GND
7	PPS_in GND		
8			

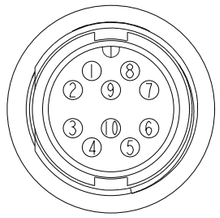
- » Isolation; Input electrically isolated. Output isolation, if required, should be at receive end.
- » Cable; Multi core screened with tinned copper conductors.

APPENDIX A.8 REMOTE POWER

Connector **AUX**

PIN	Function
1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	+5.5V Isolated
7	GND(5.5V,KP1_OUT)
8	REMOTE_PWR_ON
9	REMOTE_PWR_ON_GND
10	

View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	+5.5V Isolated
7	GND(5.5V,KP1_OUT)
8	REMOTE_PWR_ON
9	REMOTE_PWR_ON_GND
10	

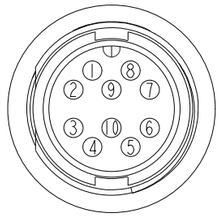
APPENDIX A.9 KP1/KP2 IN

Connector **AUX**

A Key Pulse (KP) can be connected to/from the sensor port of the DRX connection plate. Input can detect a short circuit in addition to a voltage ranging from 0 - 15 V. See "KP (Key Pulse) Settings" operating the WASSP system with a key pulse.

PIN	Function
1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	+5.5V Isolated
7	GND(5.5V,KP1_OUT)
8	REMOTE_PWR_ON
9	REMOTE_PWR_ON_GND
10	

View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	KP1_in	←	KP H
2	KP1_in_GND	←	KP C
3	KP2_in		
4	KP2_in_GND		
5	KP1_OUT		
6	+5.5V Isolated		
7	GND(5.5V,KP1_OUT)		
8	REMOTE_PWR_ON		
9	REMOTE_PWR_ON_GND		
10			

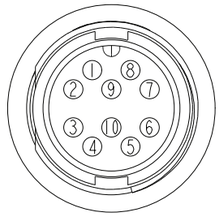
» Isolation; Fully electrically isolated.
» Drive; Selectable as high, low or auto.

APPENDIX A.10 KP1 OUT

Connector **AUX**

PIN	Function
1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	+5.5V Isolated
7	GND(5.5V,KP1_OUT)
8	REMOTE_PWR_ON
9	REMOTE_PWR_ON_GND
10	

View: Looking **into** the socket on the DRX. Wiring view of cable side on plug.



Example Connection:

1	KP1_in		
2	KP1_in_GND		
3	KP2_in		
4	KP2_in_GND		
5	KP1_OUT	→	KP IN H
6	+5.5V Isolated	→	+VIN
7	GND(5.5V,KP1_OUT)	→	KP IN C
8	REMOTE_PWR_ON		
9	REMOTE_PWR_ON_GND		
10			

» Isolation; Fully electrically isolated.

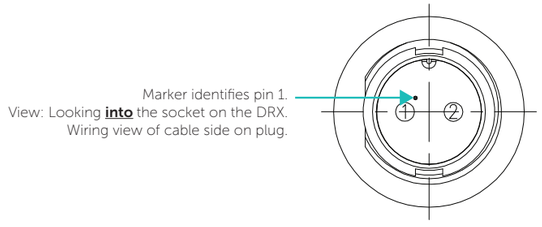
NOTE: For DRX serial numbers below #360 please refer to WASSP DRX Installation Manual Version 4.0, as output isolation, if required, should be at receive end.

APPENDIX A.11 POWER CONNECTION

Connect the cable assembly to appropriate DC power supply and connect to the POWER connector located on the connection end of the DRX.

See below for connection details.

Pin No.	Colour
1 (+)	Red or Clear
2 (-)	Black



NOTE: Recommended Fuse/Circuit Breaker ratings:

DRX WSP-603-20X; DRX-32

Peak current at 12V is 3A

Peak current at 24V is 1.5A

Recommended 5A to 10A Breaker

DRX WSP-603-250; DRX-46

Peak current at 24V is 12A

Recommended 15A Breaker

APPENDIX A.12 ETHERNET

Standard Gigabit Ethernet.

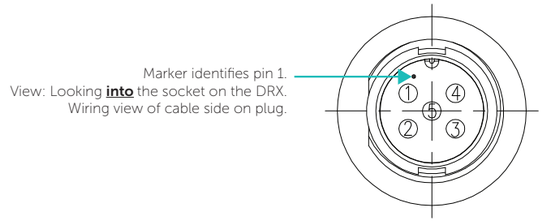
Std T568A wiring:

1	TP1+
2	TP1 -
3	TP2 +
4	TP3 +
5	TP3 -
6	TP2 -
7	TP4 +
8	TP4 -

APPENDIX A.13 NMEA2K

Connector **N2K**

PIN	Function
1	SHIELD
2	+12V
3	GND
4	NET-H
5	NET-L



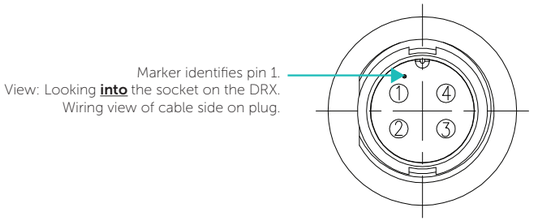
» Isolation; Fully electrically isolated.

» Standard DeviceNet, “NMEA 2000 Approved”.

APPENDIX A.14 FAN

Depending on DRX Model, an optional FAN can be added to assist cooling the DRX in high temperature environments. The fan connector has two 12V outputs that are switched on when the DRX is turned on/off.

PIN	Function
1	12V +
2	12V +
3	12V –
4	12V –



» Voltage; Regulated.

» Current should not exceed 1A.

APPENDIX B - SUPPORTED SENSORS AND SENTENCES

The following tables show sensors and sentences currently supported by DRX. This is not a definitive list and is updated as required.

Device	Configuration
Furuno SC30/SC50	Position and heading via IF-NMEASC Interface unit *Select Sentence #7 when configuring the IF-NMEASC port. This will output ATT, HVE, GGA, VTG and ZDA NMEA sentences. Set baud rate to 38400bps and interval to 25ms.*
SMC IMU-108	Roll, pitch, heave, TSS1
Trimble GPS	Position, heading, speed, TNL GGK, HDT, VTG sentences
Hemisphere V103	Position and heading; GGA, HDT, ZDA, VTG
Spatial IMU	Roll, Pitch, Heave; TSS1
SMC IMU-008	Roll, Pitch, Heave; TSS1
Valeport MiniSVS/ MiniSVP Valeport Midas	Valeport Real Time format; Sound Velocity<TAB> Units<CR><LF>
AML Xchange	Xchange Format; Sound Velocity<CR><LF>

Table 1. Supported Sensors

NMEA 0183 and serial sentences supported by DRX:

NMEA / Serial Sentence	Description
GGA	GPS Position Fix and related data
GLL	Position, Latitude/Longitude
GNS	GNSS position fix data and related data
PTNL GGK	Trimble Geographic Position
RMC	Navigation Information; Position, Track Made Good and Speed Over Ground
ZDA	Time and date
HDG	Magnetic Heading
HDT	True Heading
HDM	Heading Magnetic
PFEC ATT	True heading (Furuno proprietary sentence), optionally pitch and roll
PFEC HVE	Heave (Furuno proprietary sentence)
TSS1	Roll, pitch, heave
PASHR	Roll, pitch, heave, heading
VTG	Track Made Good and Ground Speed
MTW	Water Temperature
AML SVS	Sound Velocity, see Supported Devices
Valeport SVS	Sound Velocity, see Supported Devices

Table 2. Supported NMEA / Serial Sentences

NMEA 0183 sentences output by DRX. Sentences are output from the NMEA 0183 port at 1Hz.

NMEA	Description
DBT	Depth Below Transducer
DBS	Depth Below Surface
DBK	Depth Below Keel

Table 3. NMEA Sentences Output

NMEA 2K	Description
None currently supported.	

Table 4. Supported NMEA 2K Sentences

Points to Note:

- Satellite Compass with PPS output will improve system timing and simplify commissioning.
- IMU performance will be improved with Satellite Compass input. Depending on IMU, Satellite Compass input may be required for accurate attitude data.

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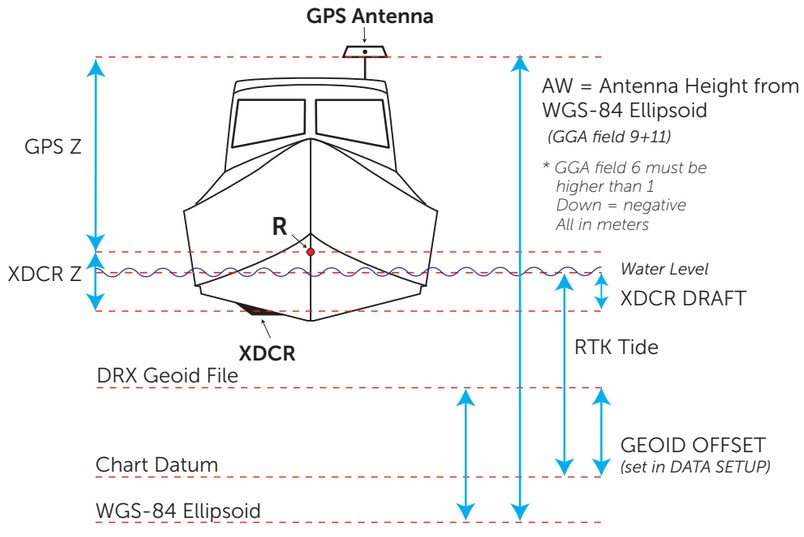
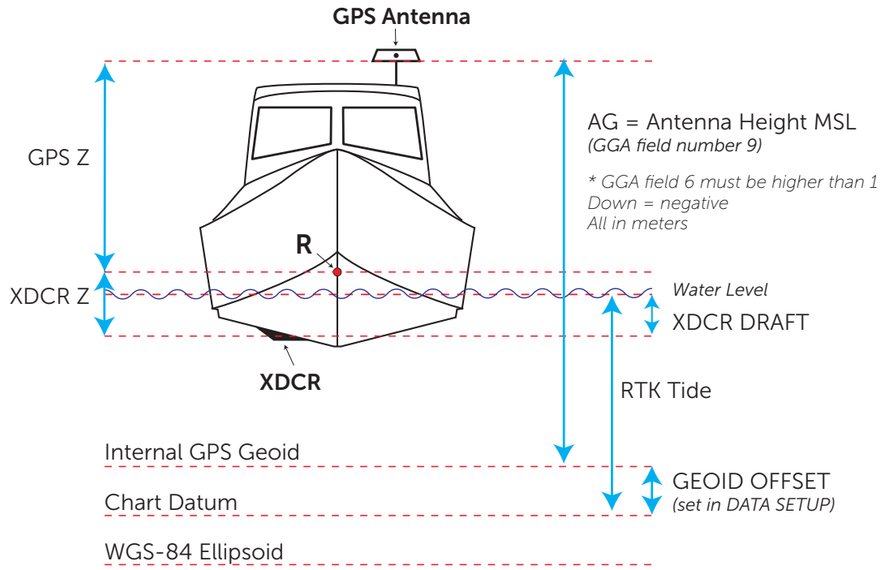
APPENDIX C - SEA LEVEL HEIGHT USING GPS HEIGHT

APPENDIX C.1 SEA LEVEL HEIGHT USING DRX GEOID FILE



RTK Tide =
AW + DRX GEOID FILE - GPS Z - XDCR Z + XDCR DRAFT + GEOID OFFSET

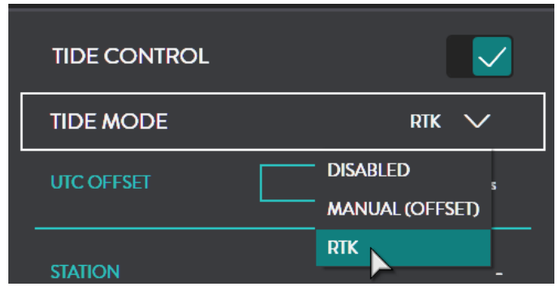
APPENDIX C.2 SEA LEVEL HEIGHT USING INTERNAL GPS GEOID



RTK tide = AG - GPS Z - XDCR Z + XDCR DRAFT + GEOID OFFSET

APPENDIX C.3 ENABLING GPS HEIGHT FOR SEA LEVEL HEIGHT

RTK tide mode can be enabled in CDX under the TIDE CONTROL.



NOTE: To enable RTK tide mode in other applications refer to the appropriate manual.

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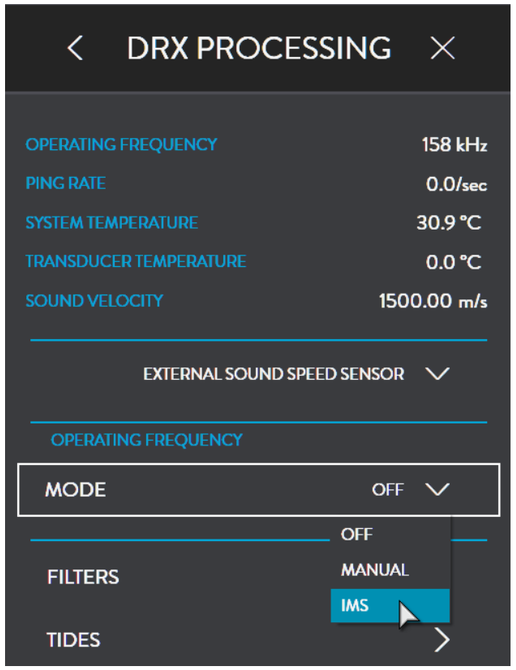
APPENDIX D - IMS CONTROL IN CDX

IMS can be turned on in CDX under DRX PROCESSING.



APPENDIX E - DRX INTERCONNECT CHANGE HISTORY

	Back Panel 1 Up to DRX #50		Back Panel 2 DRX #51 to #216		Back Panel 3 DRX #217+		Back Panel 4 DRX #360+		Back Panel 5 DRX #389+, DRX-46 #1+	
	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin
RS422-A	RS-422, PPS	6	RS-422, PPS	9	RS-422, PPS, DC 9-32V	9	RS-422, PPS, DC 9-32V	9	RS-422, PPS, DC 9-32V	9
RS422-B	n/a	-	n/a	-	RS-422, PPS	12	RS-422, PPS	12	RS-422, PPS, DC 9-32V	12
RS232	RS-232, Remote PWR	6	RS-232	6	RS-232, DC 9-32V	6	RS-232, DC 9-32V	6	RS-232, DC 9-32V	6
0183	NMEA0183, PPS	8	NMEA0183, PPS	8	NMEA0183, PPS	8	NMEA0183, PPS	8	NMEA0183, PPS	8
AUX	KP In, KP Out, PPS	8	KP In, KP Out, Remote PWR	8	KP In, KP Out, Remote PWR	8	KP In, KP Out (Isolated) KP-EXT-SW, Remote PWR	10	KP In, KP Out (Isolated) KP-EXT-SW, Remote PWR	10
FAN - DRX-46									12V x 2	4
Manual Reference	Version 1.1		Version 2.0		Version 4.0		Version 4.2		Version 5.0	

APPENDIX F - GLOSSARY

Term	Description
DHCP	Dynamic Host Configuration Protocol, for automatically providing IP addresses.
DRX-32	DRX model used with S3 And F3 product models.
DRX-46	DRX model used with F3X product models.
DRX Setup Webpages	Webpages that DRX provides for configuration, setup, installation, upgrading.
GbE	Gigabit Ethernet.
HDG	Heading.
IMU	Inertial Motion Unit/Motion Sensor, typically for roll, pitch and heave.
KP	Key Pulse, typically used to synchronise sonar/sounder transmit timing.
LAN	Local Area Network.
LED	Light Emitting Diode.
PPS	Pulse Per Second, used for synchronising time, typically to UTC through GPS.
RTK GPS	Real Time Kinematic GPS, used for high quality positioning.
RX	Receive.
TX	Transmit.
WASSP CDX	WASSP PC application for control, visualisation and post processing of DRX data.
XDCR	Transducer.

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APPENDIX G - PRODUCT REGISTRATION, SUPPORT AND RESOURCES

WARRANTY

DRX products are covered with a one year limited warranty. In order to be covered by the warranty, the WASSP DRX must be registered with WASSP Ltd. The product warranty registration form can be filled in online by going to:
http://wassp.com/product-warranty-registration/

TECHNICAL SUPPORT

If you require maintenance and/or repair contact your local dealer. A list of WASSP dealers and distributors is available at wassp.com.

DRX technical support is available directly through:

» Online: http://wassp.com/support/ and click on 'Request Support'

LATEST RESOURCES

» For the latest version of manuals: http://wassp.com/support/ and click on 'Manuals'

» For software updates and release notes: http://wassp.com/support/ and click on 'Request Support'

» For Knowledge Base: http://support.wassp.com:8095/display/KB/

» For System drawings, mechanical drawings and declarations of conformity: http://wassp.com/support/ and click on 'Request Support'

YOUR NOTES

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YOUR NOTES

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