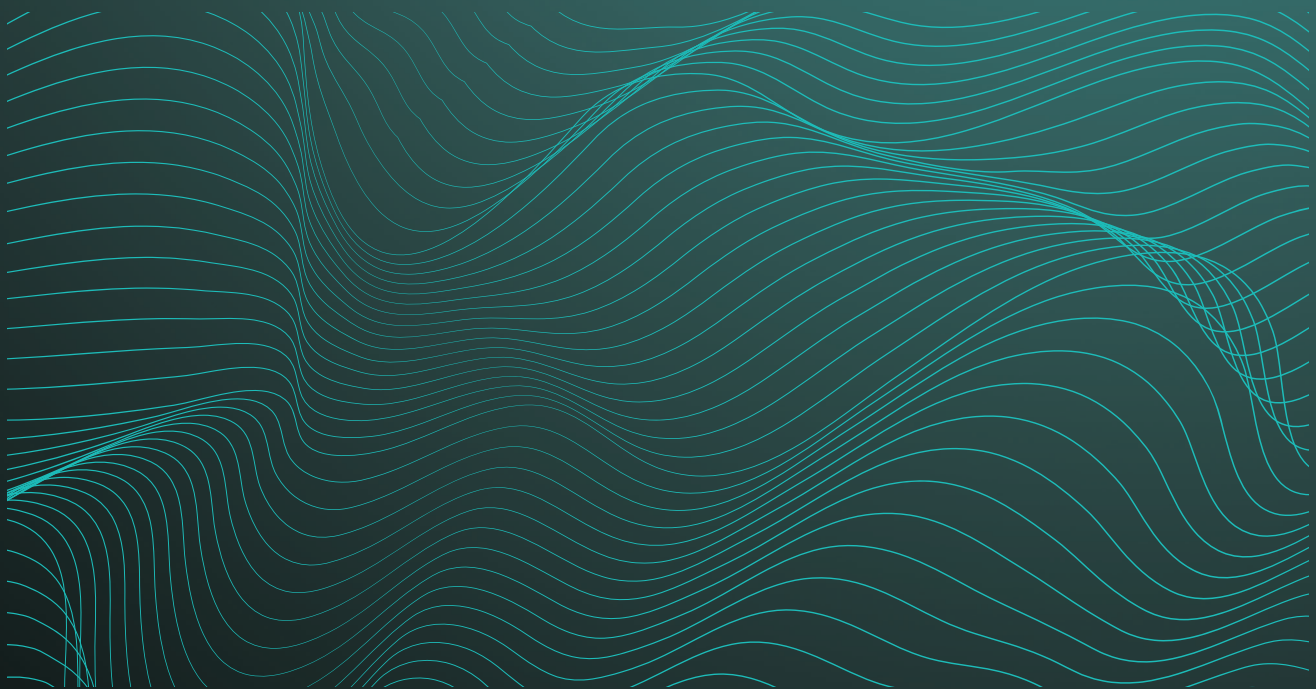


# DRX INSTALLATION MANUAL



**wassp**<sup>®</sup>  
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.



**NOTE:** For DRX with serial number below #50, please refer to WASSP DRX Installation Manual Version 1.1 due to connector configuration changes.

## 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

## RELATED DOCUMENTS

- » WASSP DRX Installation Manual – For the latest version of this manual go to [wassp.com](http://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.
- » WASSP DRX Utilities Operators Manual – Manual describing utility applications shipped with WASSP DRX.
- » 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](http://wassp.com)

## 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.
- » 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 C - Product Registration, Support and Resources"* on page 70.

## 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.

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# GLOSSARY

Term	Description
DHCP	Dynamic Host Configuration Protocol, for automatically providing IP addresses.
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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## 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 currently available in 3 configurations:

- » WSP-603-200; DRX wideband model
- » WSP-603-300; DRX-46 wideband model
- » WSP-603-205; DRX wideband model with IP67 rating

The same software package is applicable to all models.

For specification details on each model [see "9 Technical Specifications" on page 57.](#)



## 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 with WMB160 transducer; 1-150m
  - DRX-46 with WMB160 transducer; 1-300m
  - DRX-46 with WMB80 transducer; 1-600m
- » 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, licence 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 PROFILER;** For accurate range measurement, sound velocity needs to be known at the transducer and through the water column.



**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 69.*

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](http://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

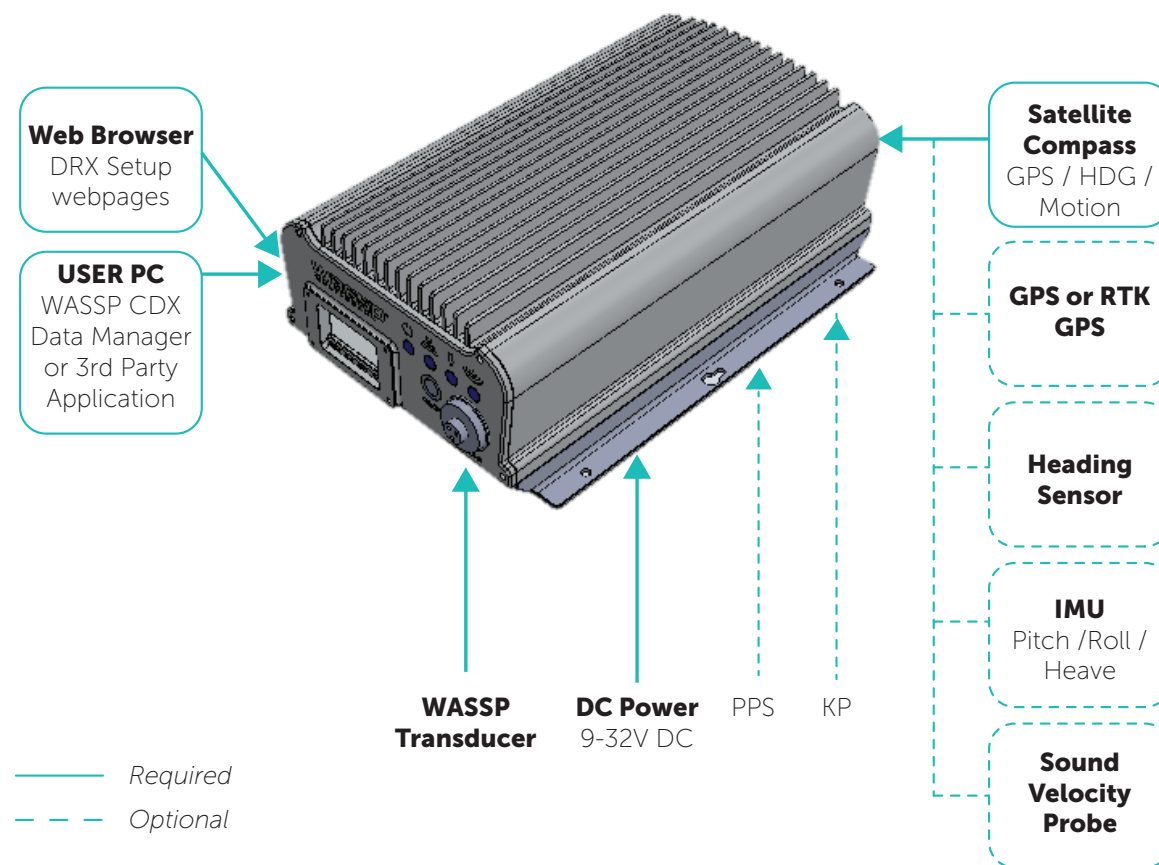


Figure 1. Complete System

## 2.2. RECOMMENDED SYSTEM

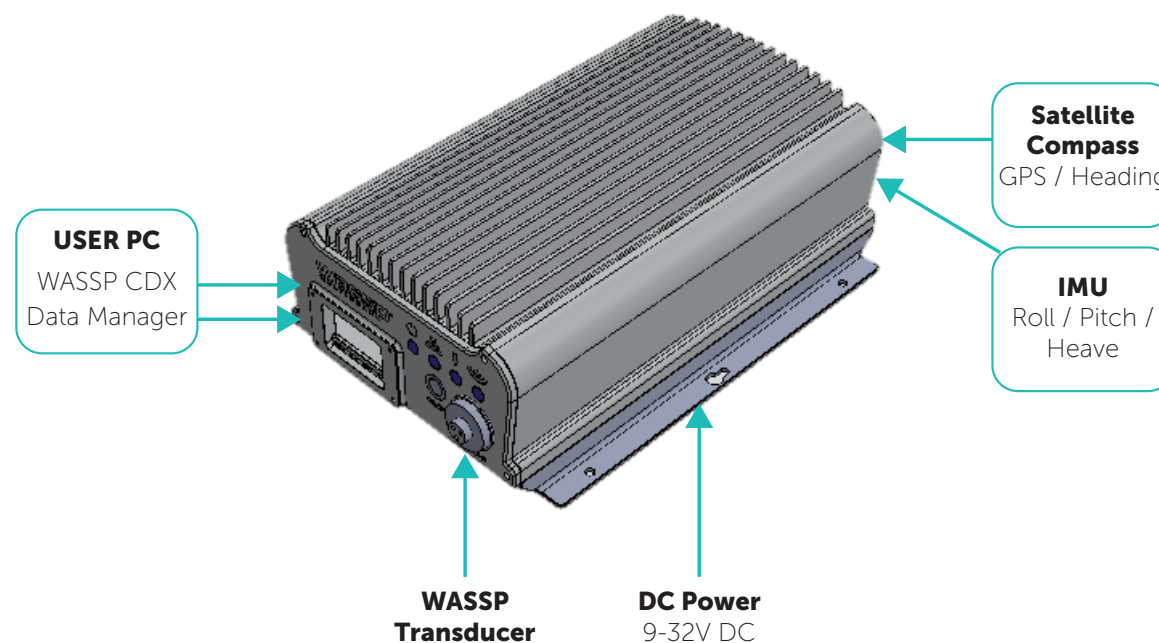


Figure 2. Recommended System

See "8.1. Interconnection For Recommended Sensors" on page 56 for recommended sensor configuration.

## 2.3. SURVEY SYSTEM

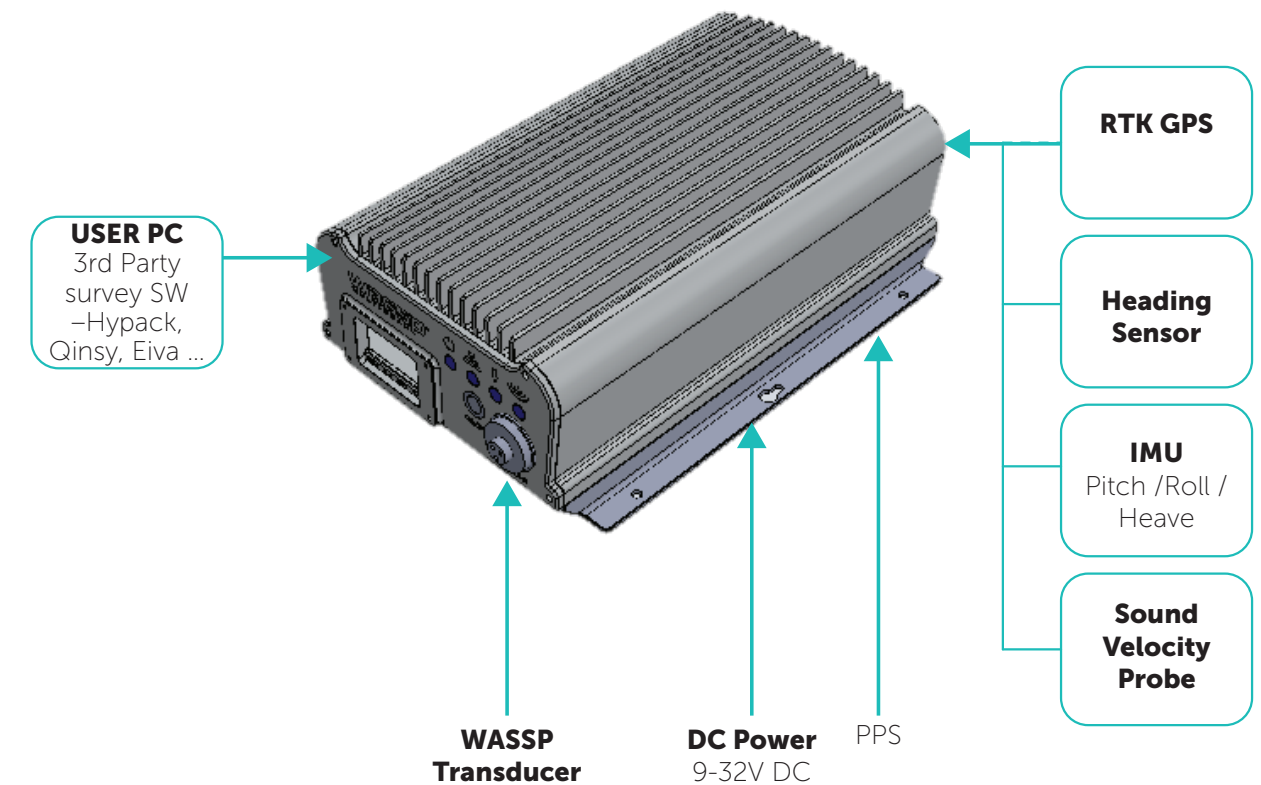
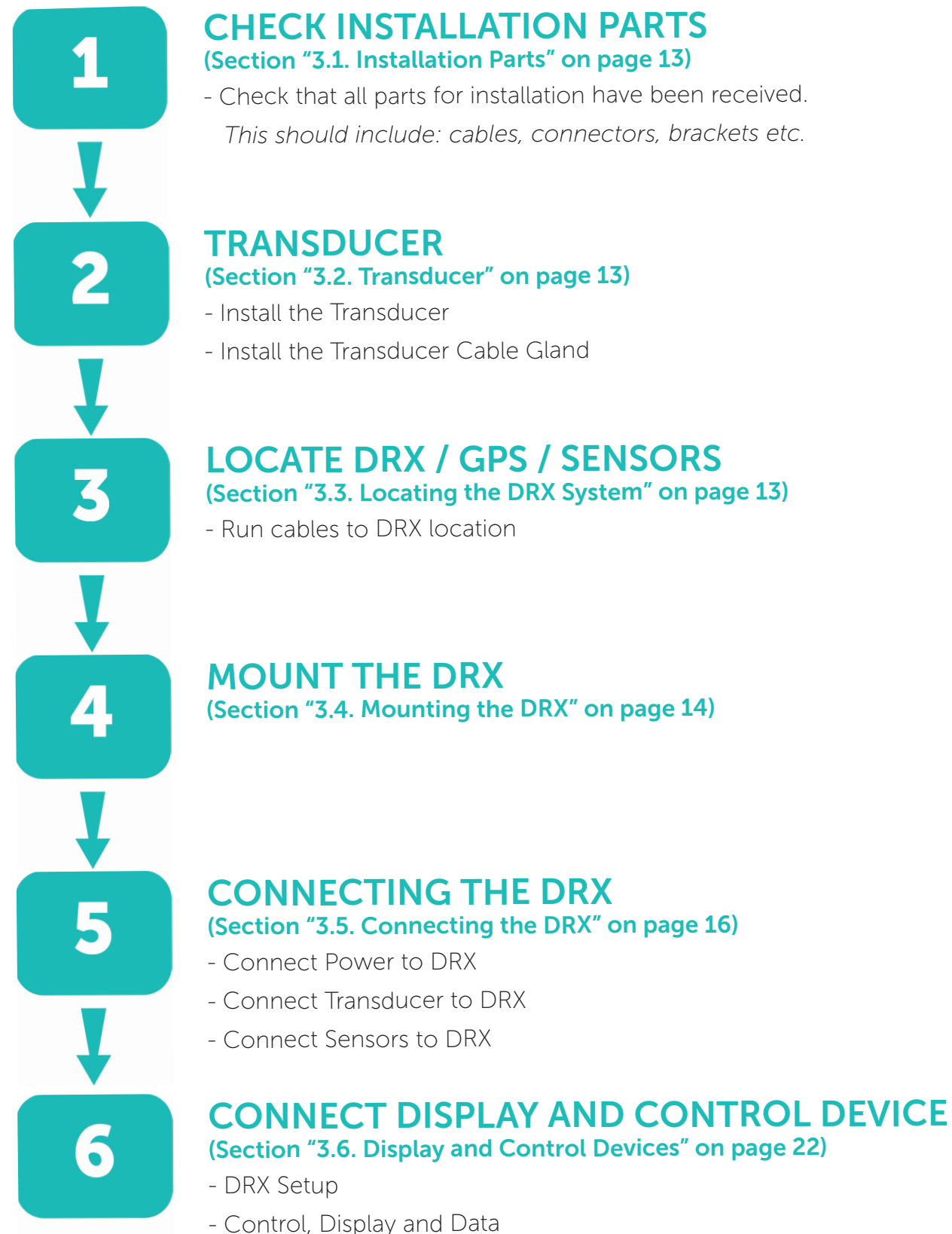


Figure 3. Survey System

## 3 INSTALLATION PROCEDURES

### Basic Installation Flow:



### 3.1. INSTALLATION PARTS

Standard supply:

- » 1 x DRX unit
- » 4 x Connector cable assemblies
- » 1 x power cable
- » 1 x LAN cable
- » 1 x USB Flash Drive:
  - Find My DRX Application
  - WASSP CDX Application
  - WASSP Utilities
  - Licence 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.

### 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. All AC/DC inverters and DC/DC converters should be switched off to maximise system sensitivity.



**CAUTION:** Operating outside the temperature specification will reduce the operating lifetime of the DRX. For specifications, see "9 Technical Specifications" on page 57.

### 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 15
- » The second option is horizontal on a hard, flat surface. See "Figure 5. DRX Horizontal Mount" on page 15.
- » If mounted in an enclosed space, forced ventilation is required to maintain an ambient temperature within the stated limits around DRX. See "Figure 4. DRX Bulkhead Mount" on page 15 and "Figure 5. DRX Horizontal Mount" on page 15. 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 53 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 recommended to avoid vibration loosening
- » DRX should 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 57.



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

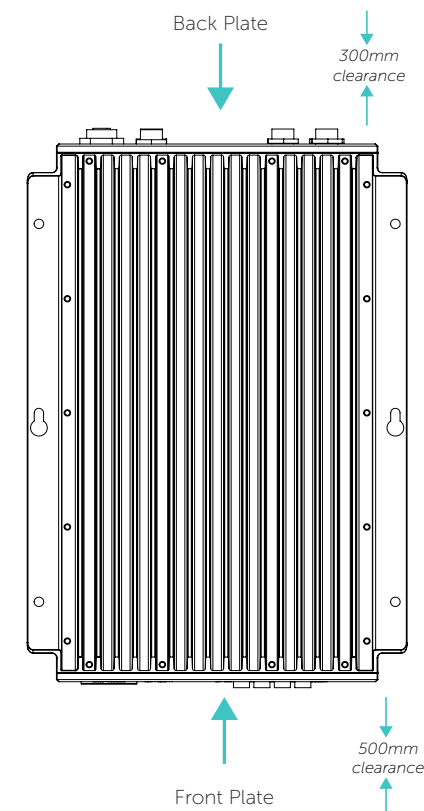


Figure 4. DRX Bulkhead Mount

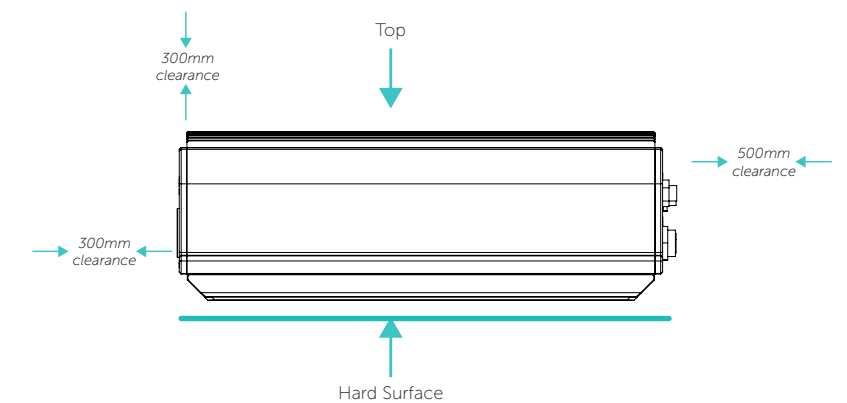


Figure 5. DRX Horizontal Mount

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 an optional fan attachment will significantly improve thermal performance. However, only use the fan attachment as an aid to cooling where 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 use a low noise AC/DC inverter.

Do not use any DC/DC converter with DRX.



**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.

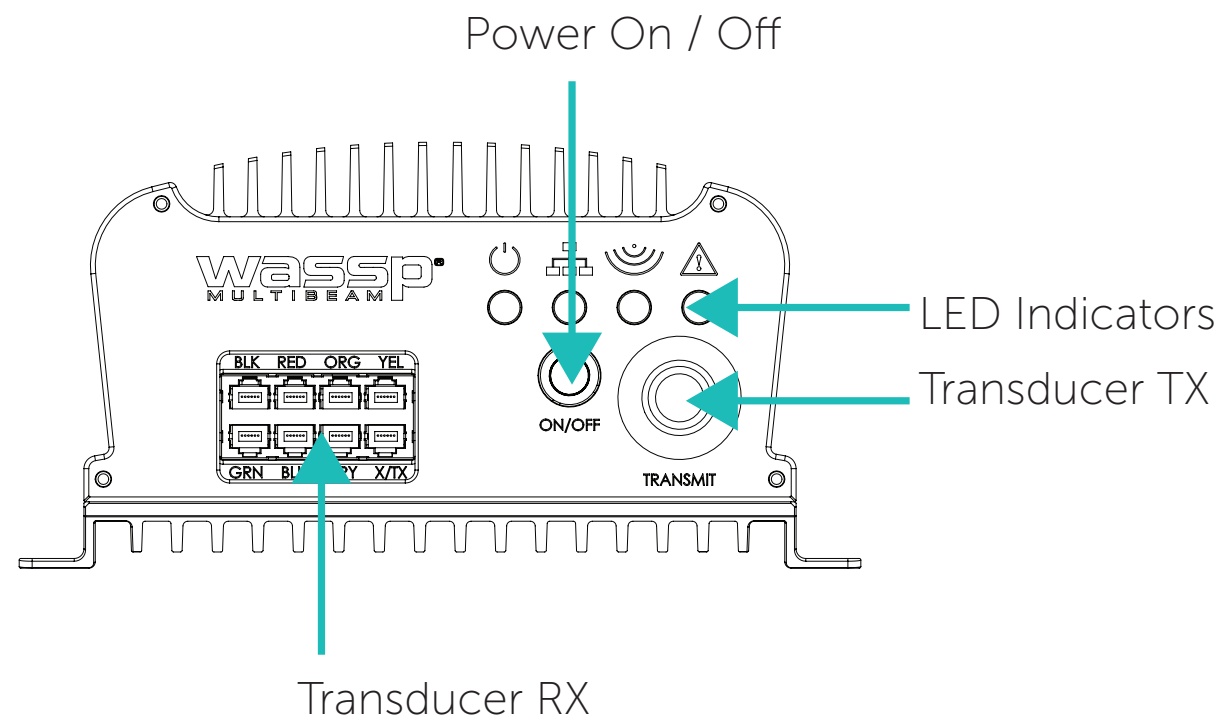


Figure 6. Front Plate



**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 17.](#)

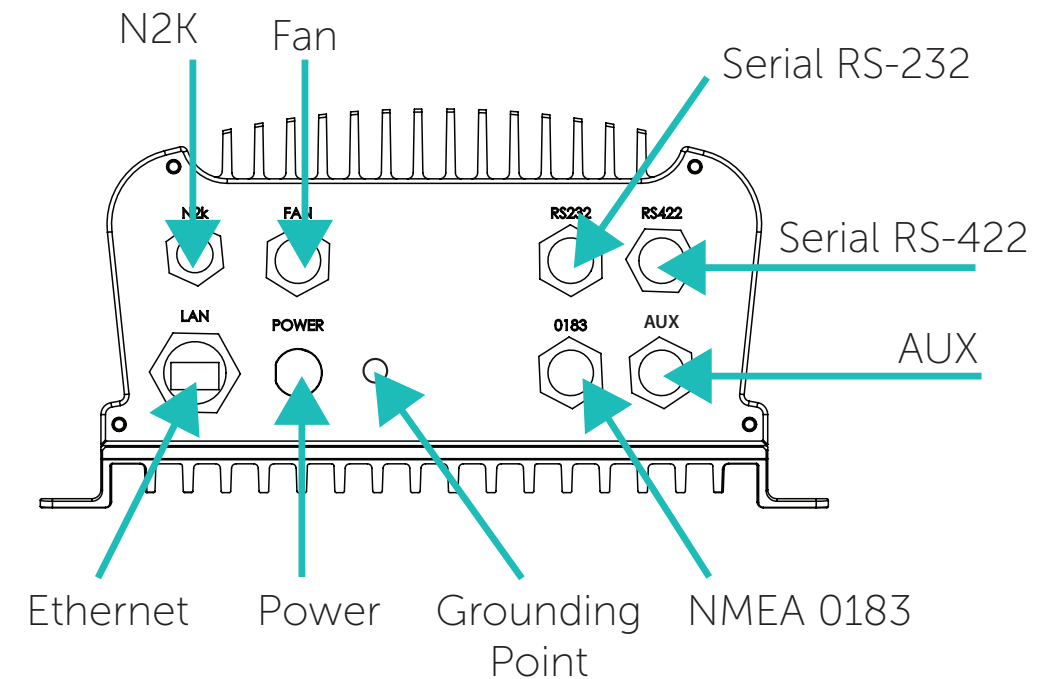


Figure 7. Back Plate



**CAUTION:** All serial cables from sensors on RS-232, RS-422 or NMEA 0183 should be direct with no splitters or interface boxes. 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 19.](#)

#### 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 19.](#)



## 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 58](#) for connection specification.

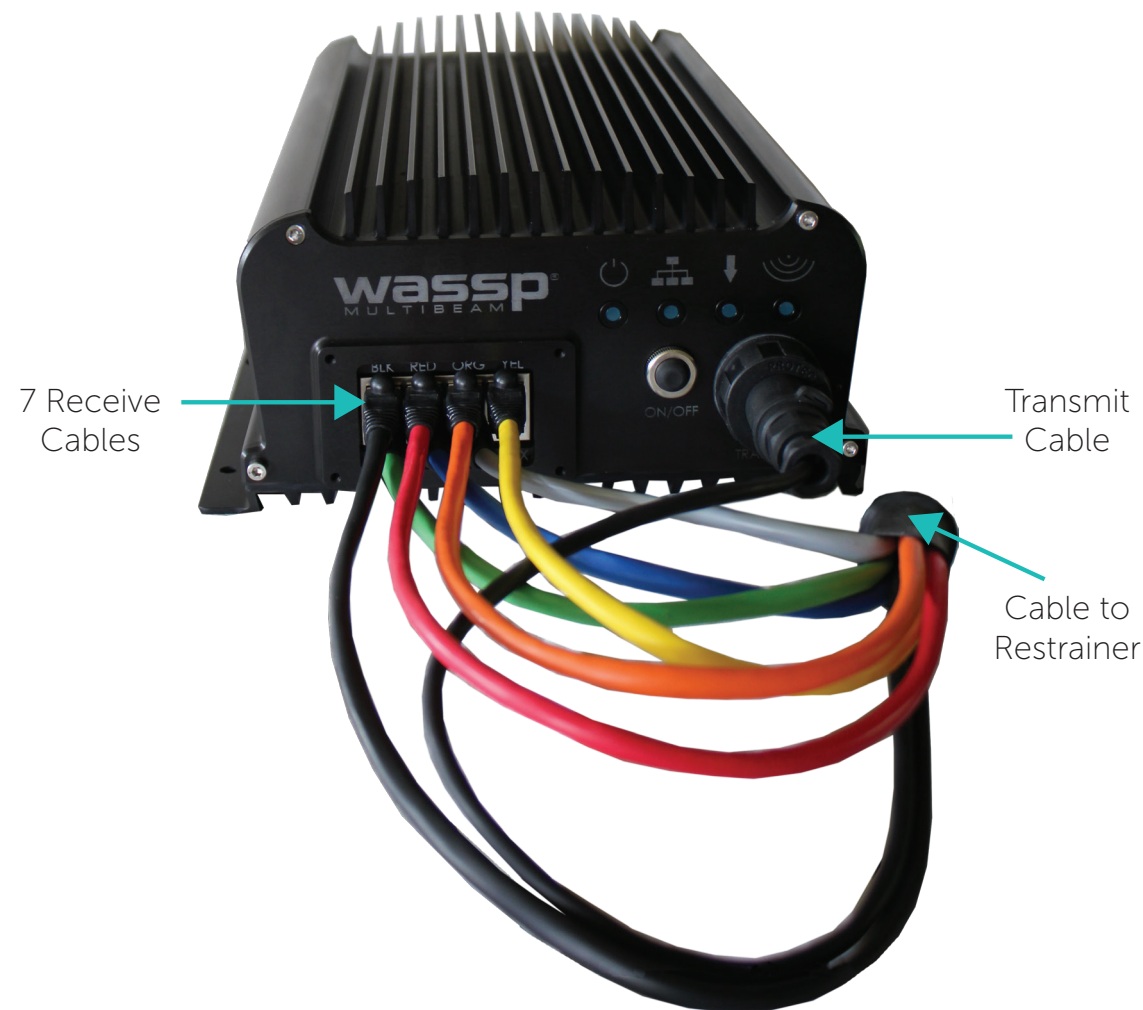


Figure 8. RX Cable Connection



**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 59](#).

## Transducer TX

The Transducer TX cable applies transmit signal to the transducer.

See ["Appendix A.3 Transducer TX" on page 60](#) 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. See ["Appendix B - Supported Sensors and Sentences" on page 69](#).

RS-232 can be configured using the [DRX SETUP WEBPAGES](#). See ["5.2. Commissioning Step 2: Sensor Configuration" on page 32](#).

See ["Appendix A.4 RS-232" on page 61](#) for connection specification.

#### RS-422 IN/OUT

Connector **RS422**

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, described below.

See ["Appendix B - Supported Sensors and Sentences" on page 69](#).

RS-422 can be configured using the [DRX SETUP WEBPAGES](#). See ["5.2. Commissioning Step 2: Sensor Configuration" on page 32](#).

See ["Appendix A.5 RS-422" on page 62](#) for connection specification.

#### 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, described below.

See ["Appendix B - Supported Sensors and Sentences" on page 69](#).

NMEA 0183 can be configured using key [DRX SETUP WEBPAGES](#). See ["5.2. Commissioning Step 2: Sensor Configuration" on page 32](#).

See ["Appendix A.6 NMEA 0183" on page 63](#) for connection specification.

## Remote Power

Connector **AUX**

A local supplied latching switch can be connected to pins four (Remote PWR On) and five (Remote PWR On GND) of connector DATA1 (RS-232). When the switch is closed the DRX will power on. When the switch is open (circuit open) then the DRX will power off.

See ["Appendix A.7 Remote Power" on page 64](#) for 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.8 KP1/KP2 In" on page 65](#) for connection specification.

## 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 ping rate of the DRX over the connected sounder.

See ["Appendix A.9 KP1 Out" on page 66](#) for connection specification.

## PPS IN

Connectors **RS422 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 32](#).

See ["Appendix A.5 RS-422" on page 62](#) and ["Appendix A.6 NMEA 0183" on page 63](#) for connection specification.

## Power

The DRX is designed to be run on DC voltage from 9-32 Vdc.

See ["Appendix A.10 Power Connection" on page 67](#) 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.11 Ethernet" on page 67](#) for connection specification.

## NMEA2K

Connector **N2K**

See ["Appendix B - Supported Sensors and Sentences" on page 69](#).

See ["Appendix A.12 NMEA2K" on page 68](#) 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.13 FAN" on page 68](#) for connection specification.

## Grounding Point

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

For optimal performance, connect the earth lug on the DRX 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.

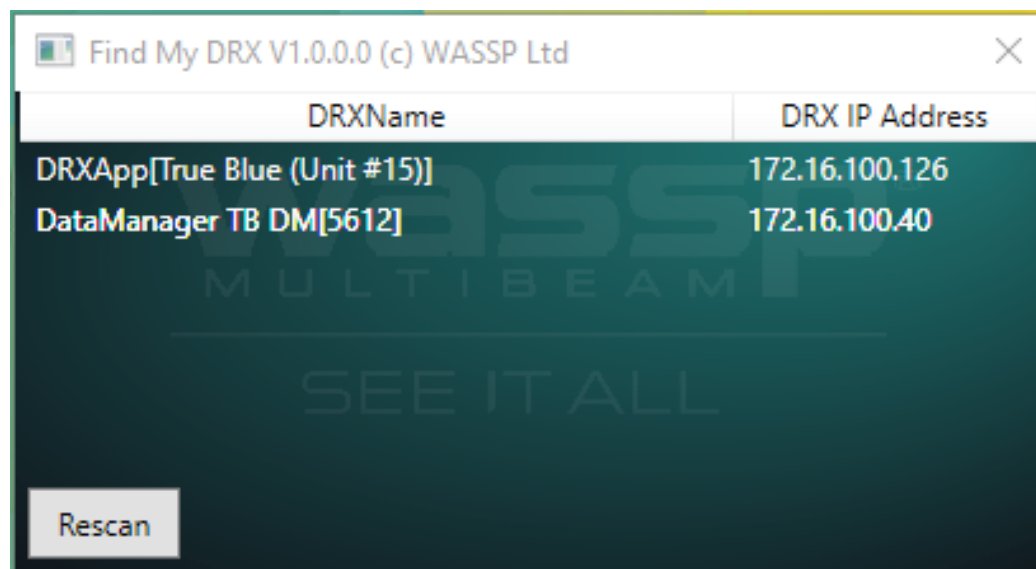


Figure 9. Find My DRX App

#### 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 30](#).

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: Some older browsers may not be fully supported. If the 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 47](#).



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:

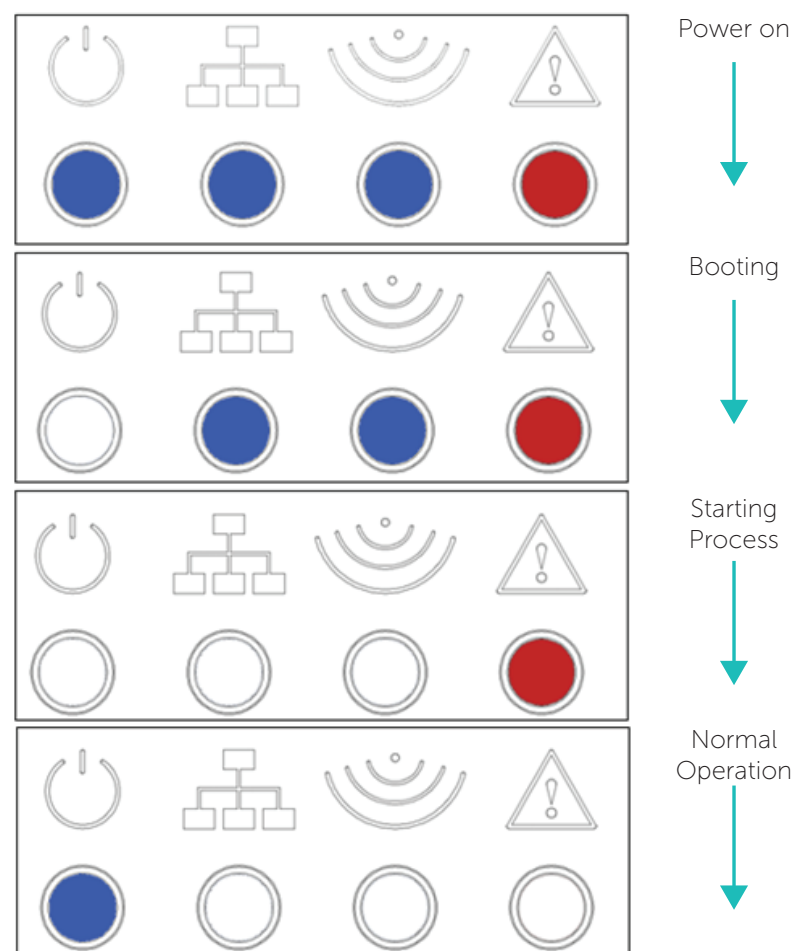


Figure 10. Startup Sequence

#### 4.2.2. Normal Operation LED Indications

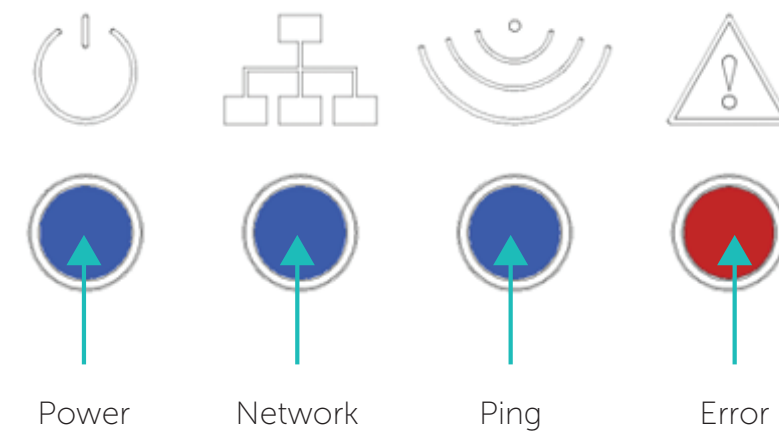


Figure 11. Normal Operation LED Indications

#### 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, refer below table for error.

Power LED	Network LED	Ping LED	Error LED	Error Description
On	Off	Off	On	Power supplied to board, but cannot boot
Off	On	Off	On	Error 1
On	Off	On	On	Error 2
On	On	Off	On	Error 3

Table 1. LED Error Status Table



### 4.3. SYSTEM UPDATE & RESTORE

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 *“3.6.1. DRX Setup Webpages” on page 22*.

To check DRX version, open the [DRX SETUP WEBPAGES](#) and open the [SYSTEM](#) 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.



**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.

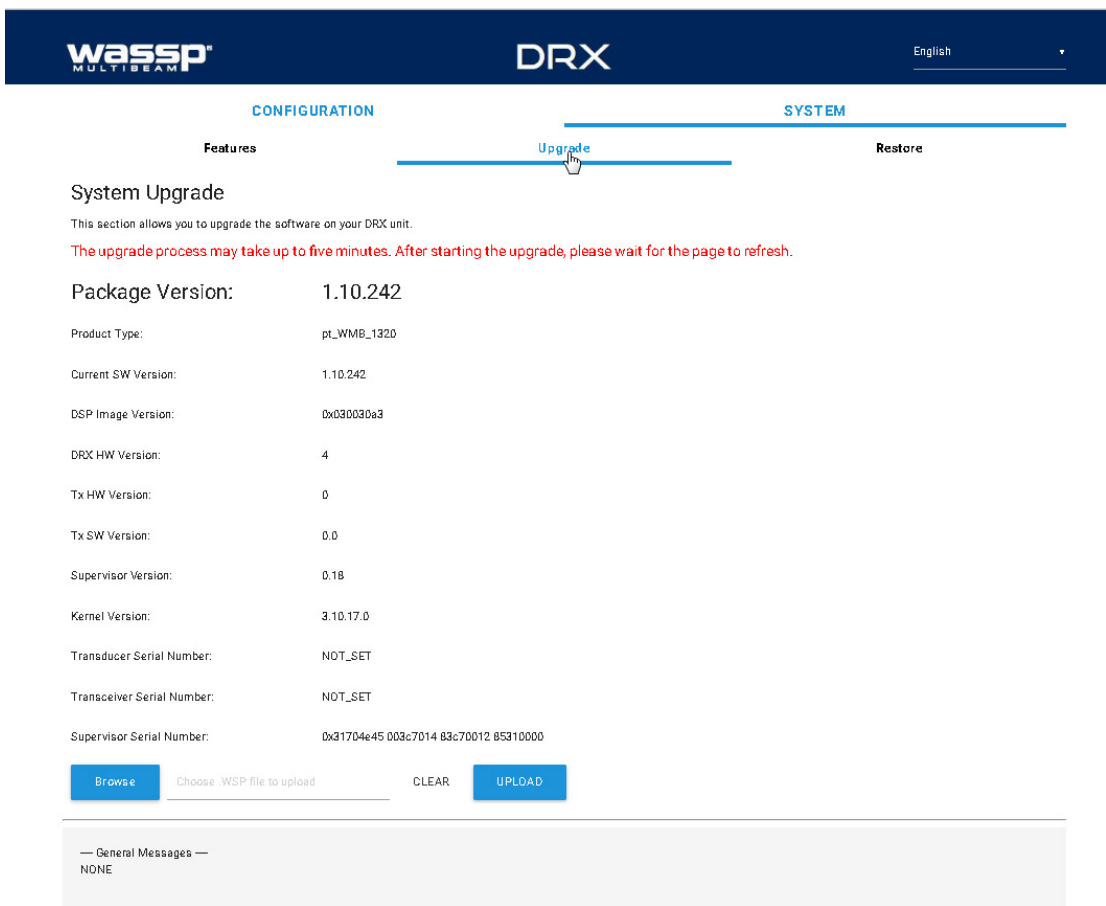


Figure 12. System Upgrade

### 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. To Perform a 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 30.*

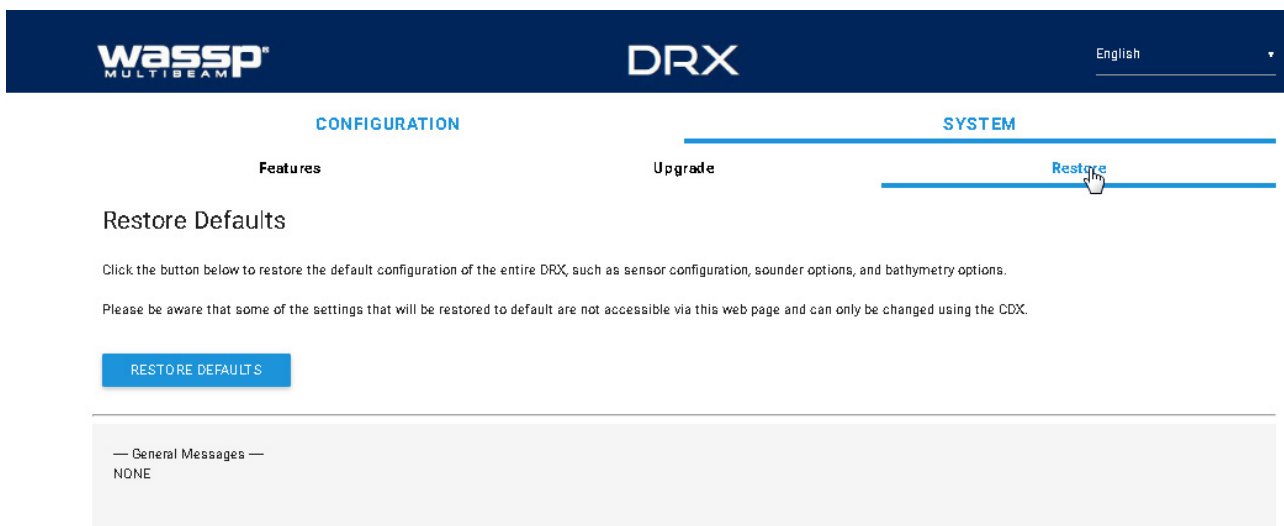


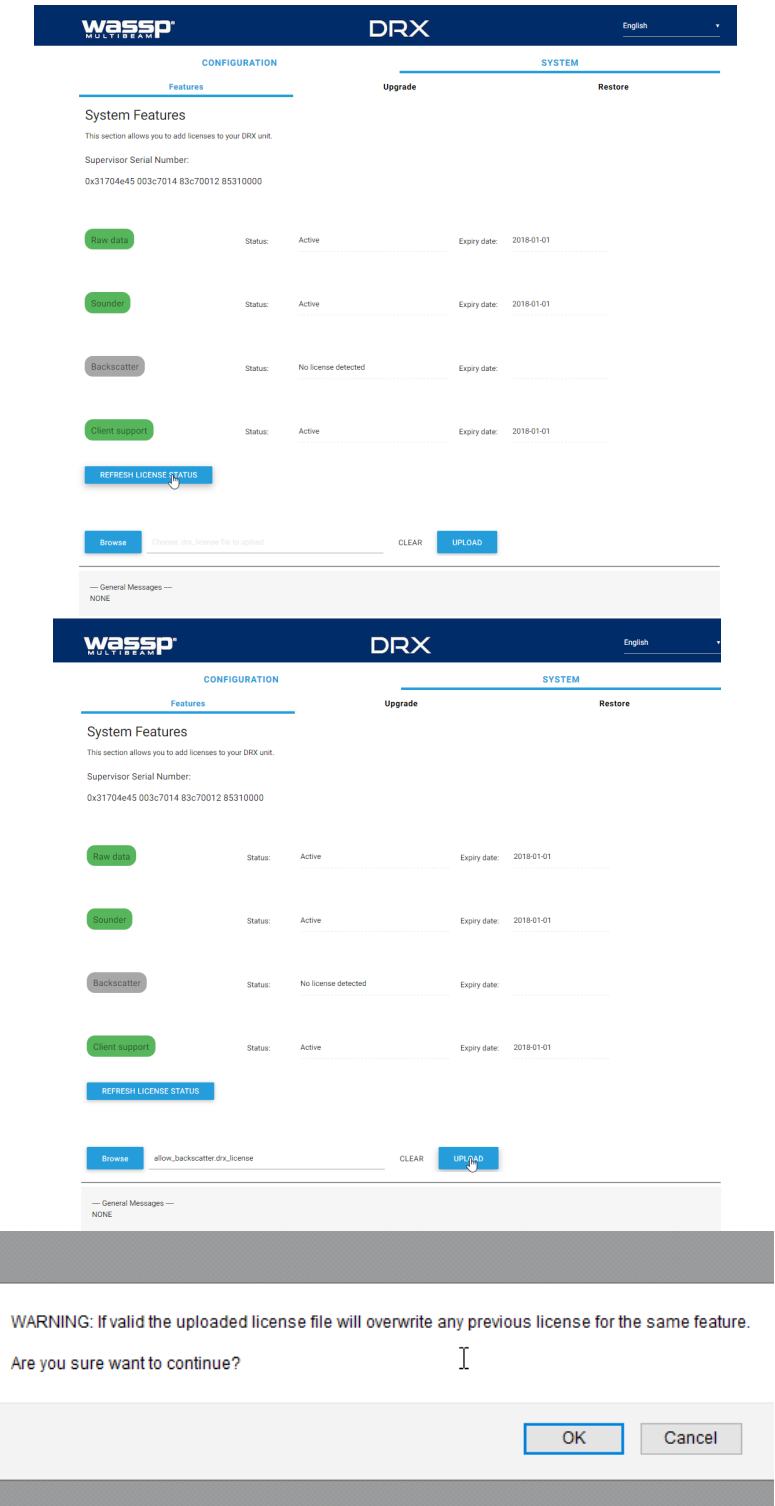
Figure 13. Restore Defaults Tab



4.4. 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.  
To install the license follow the steps below:

- 1. Select **SYSTEM** tab and select **FEATURES** tab.
- 2. Select the **REFRESH LICENSE STATUS** button to see current active licences 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. Licence file will be uploaded and applied.

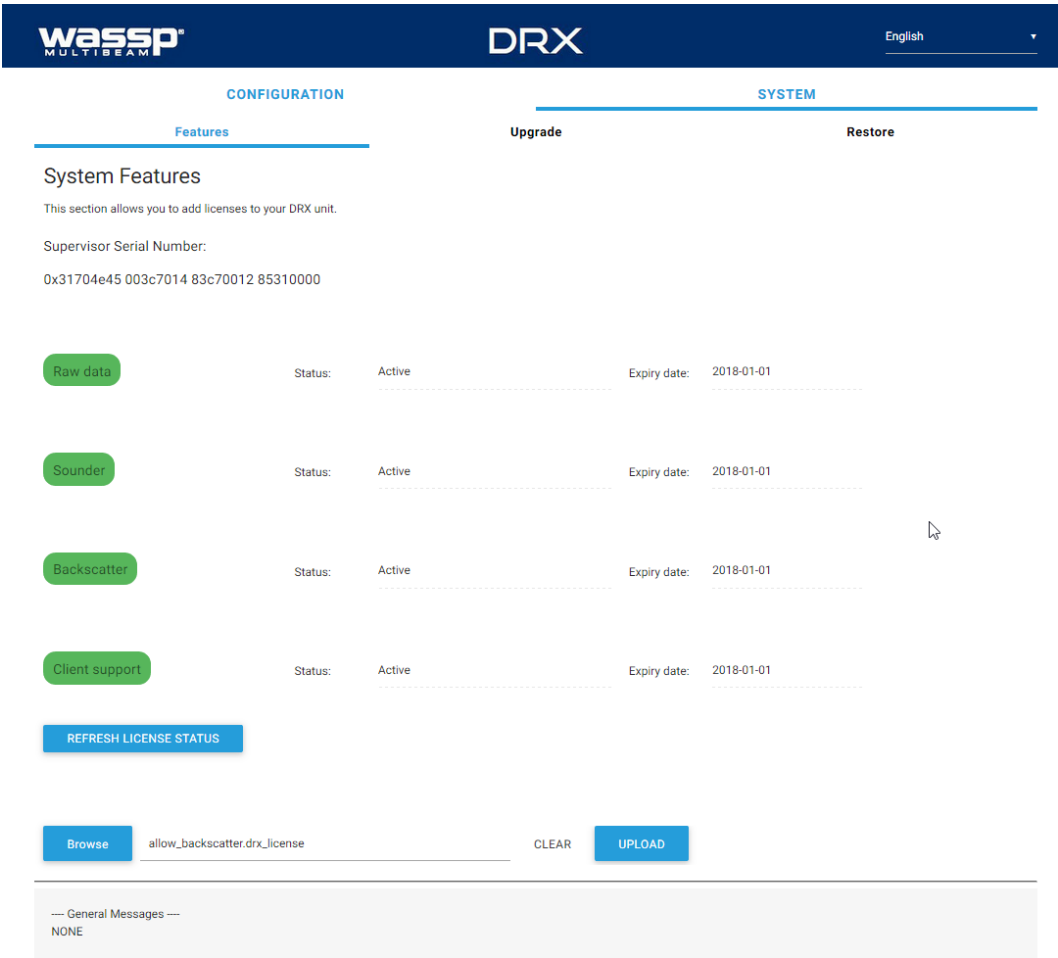
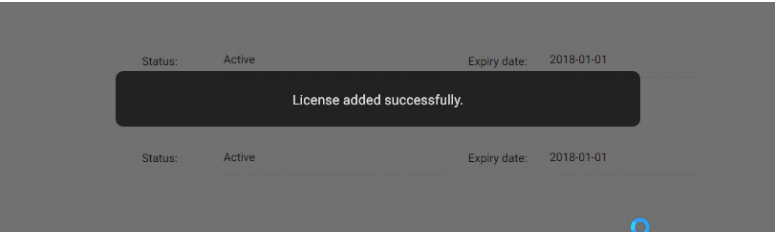


Figure 14. System Features

## 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 69.



NOTE: Currently support sensors and sentences will depend on software version and can be found at [wassp.com](http://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 15. Ship Measurements Diagram" on page 31. **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 18. DRX Setup, Sensor Tab" on page 34.



NOTE: The Ships Reference Point is an arbitrary 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

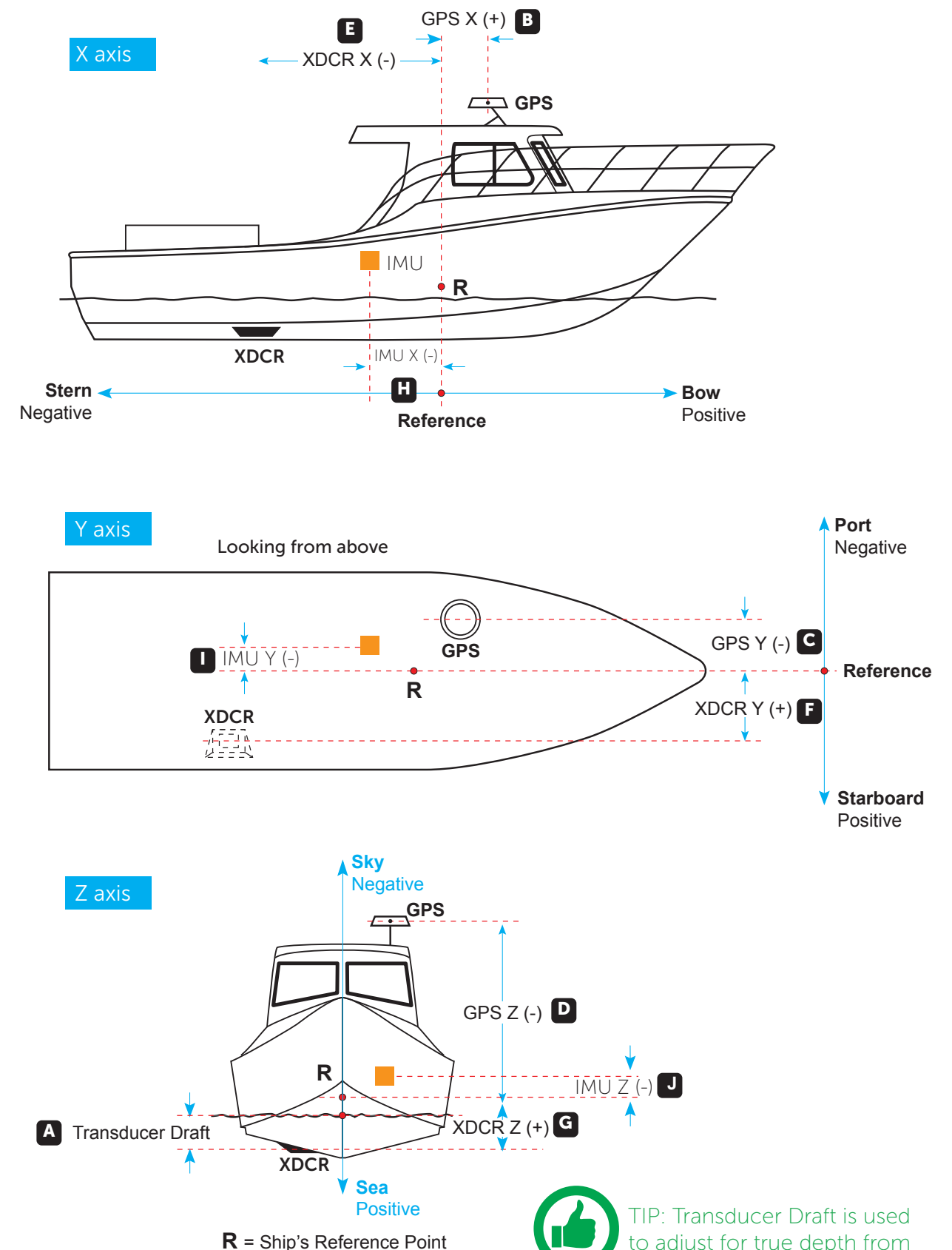


Figure 15. Ship Measurements Diagram

## 5.2. COMMISSIONING STEP 2: SENSOR CONFIGURATION

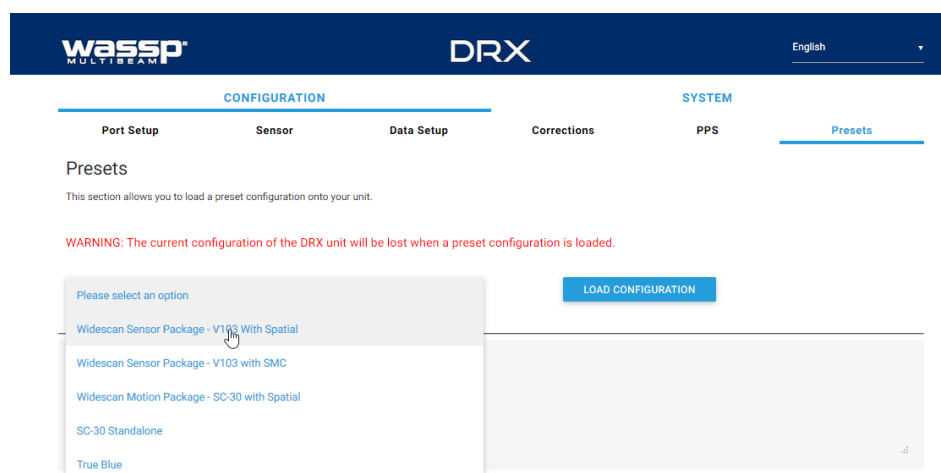
The Configuration section of the [DRX SETUP WEBPAGES](#) is used for configuring the DRX physical ports and the sensors connected to the DRX.

Launching the [DRX SYSTEM WEBPAGE](#) is described in *"3.6. Display and Control Devices" on page 22.*

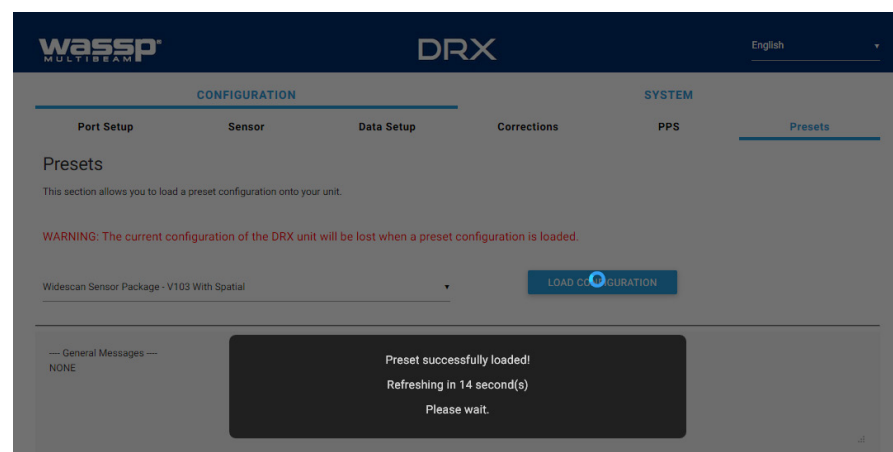
### 5.2.1. Presets Tab

The [PRESETS](#) Tab allows a selection of preconfigured sensor setup options. This is used for automatically configuring sensors in typical deployments. To select a Preset:

1. Select required preset from the [PRESETS](#) tab
2. Select the [LOAD CONFIGURATION](#) button.



3. Presets will be loaded and set [PORT SETUP](#), [SENSOR](#), [DATA SETUP](#), [CORRECTIONS](#). [PPS](#) configuration.



NOTE: Sensor Offsets still need to be manually setup.

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
- » Widescan Motion Package – SC-30 With Spatial; Motion package supplied as option kit to be used with customer supply SC-30 Satellite Compass. Reference Sensor Box Installation Manual for details
- » 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.

### 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.

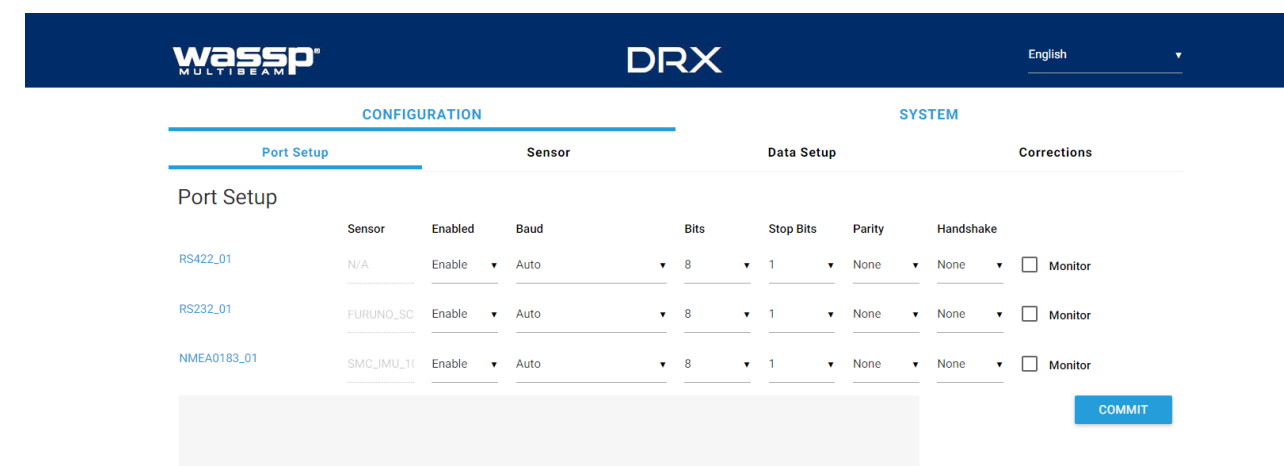


Figure 16. DRX Setup, Port Setup Table

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.

Sensor	Enabled	Baud	Bits	Stop Bits	Parity	Handshake	Monitor	
RS422_01	N/A	Enable ▼	Auto	8	1	None	None	<input type="checkbox"/>
RS232_01	FURUNO	Enable ▼	Auto	8	1	None	None	<input checked="" type="checkbox"/>
NMEA0183_01	N/A	Enable ▼	Auto	8	1	None	None	<input type="checkbox"/>

149401301720 RS232\_01:\$PSEC,GPtIVE,00.4,A\*03  
 1494616064328 RS232\_01:\$GPZDA,092023.43,17,12,2015,+00,00\*43  
 1494619496792 RS232\_01:\$GPVTG,115.4,T,118.6,M,3.9,N,7.2,K\*4e  
 1494622929176 RS232\_01:\$GPHDT,115.4,T\*34  
 1495612423424 RS232\_01:\$PFEC,GPatt,118.6,63.0,58.0\*4e  
 1495615366112 RS232\_01:\$PFEC,GPhve,77.2,A\*0d  
 1495617763712 RS232\_01:\$GPZDA,092024.43,17,12,2015,+00,00\*44

COMMIT

Figure 17. 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	X Offset	Y Offset	Z Offset	Port	
Transducer	-0.30	-1.10	1.86		
Sensor 1	Furuno SC30	2.19	-1.03	-1.92	RS232_01
Sensor 2	SMC IMU-108	1.14	0.07	-0.60	NMEA0183_01
Sensor 3	N/A				N/A
Sensor 4	N/A				N/A
Sensor 5	N/A				N/A

COMMIT

Figure 18. 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 30.
- » Port; Select the physical port on the DRX that the sensor is connected to from the drop down list.



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.

Sensor	Sentence	Lag	Bias	Current Value
POSITION	Furuno SC30	GGA	0.06	031.309127,120.605343
HEADING	Furuno SC30	HDT	0.06	20.300
ROLL	Furuno SC30	PFEC,ATT	0.00	12.700
PITCH	Furuno SC30	PFEC,ATT	0.00	02.000
HEAVE	Furuno SC30	PFEC,HVE	0.00	00.500
TIME	Furuno SC30	ZDA	0.00	0

COMMIT

Figure 19. 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 40](#) 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 40](#) gives details on calculating bias for each of roll, pitch and heading.



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, and correct for depth through adjusting transducer draft.

Correction Type	Enabled	Invert
Roll	<input checked="" type="checkbox"/> <span style="color: green;">●</span>	<input type="checkbox"/> <span style="color: red;">●</span>
Pitch	<input checked="" type="checkbox"/> <span style="color: green;">●</span>	<input type="checkbox"/> <span style="color: red;">●</span>
Heave	<input checked="" type="checkbox"/> <span style="color: green;">●</span>	<input type="checkbox"/> <span style="color: red;">●</span>
Induced Heave	<input checked="" type="checkbox"/> <span style="color: green;">●</span>	

Transducer Draft:

**COMMIT**

--- General Messages ---  
NONE

Figure 20. 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:

7. Select the check boxes of the attitude correction that should be inverted, under **INVERT**.
8. Press **COMMIT** button to save any changes.
9. 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 15. Ship Measurements Diagram" on page 31](#).



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.



## 5.2.6. 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.

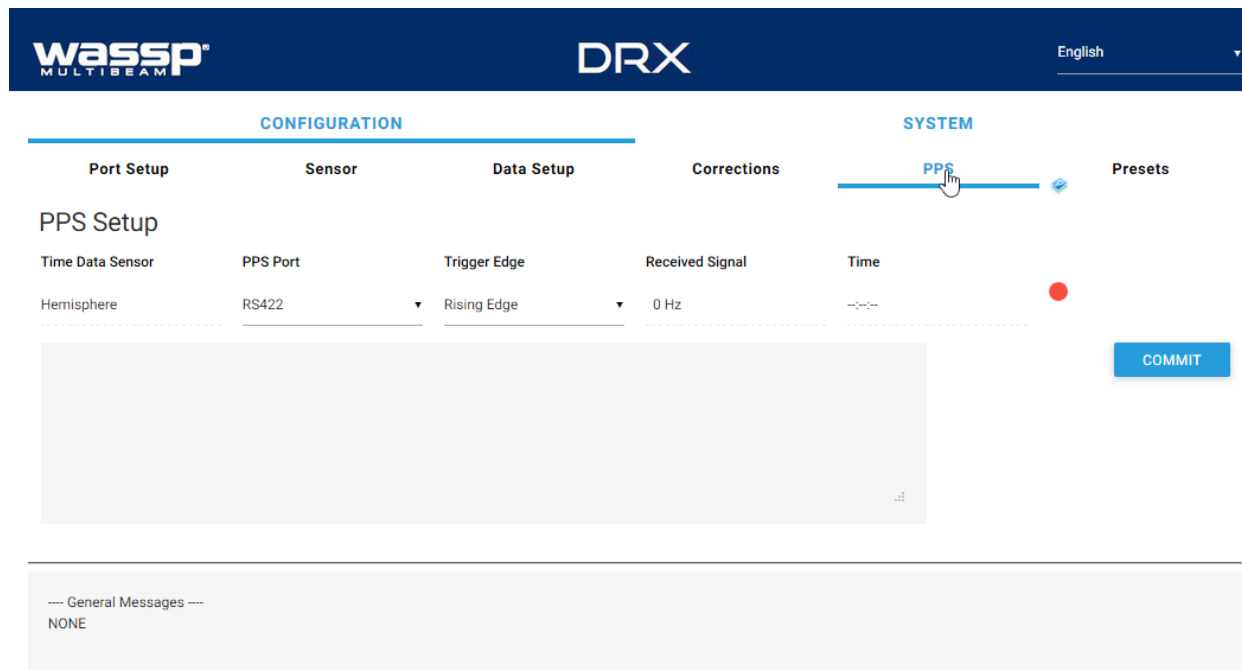


Figure 21. DRX Setup, PPS Tab

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:

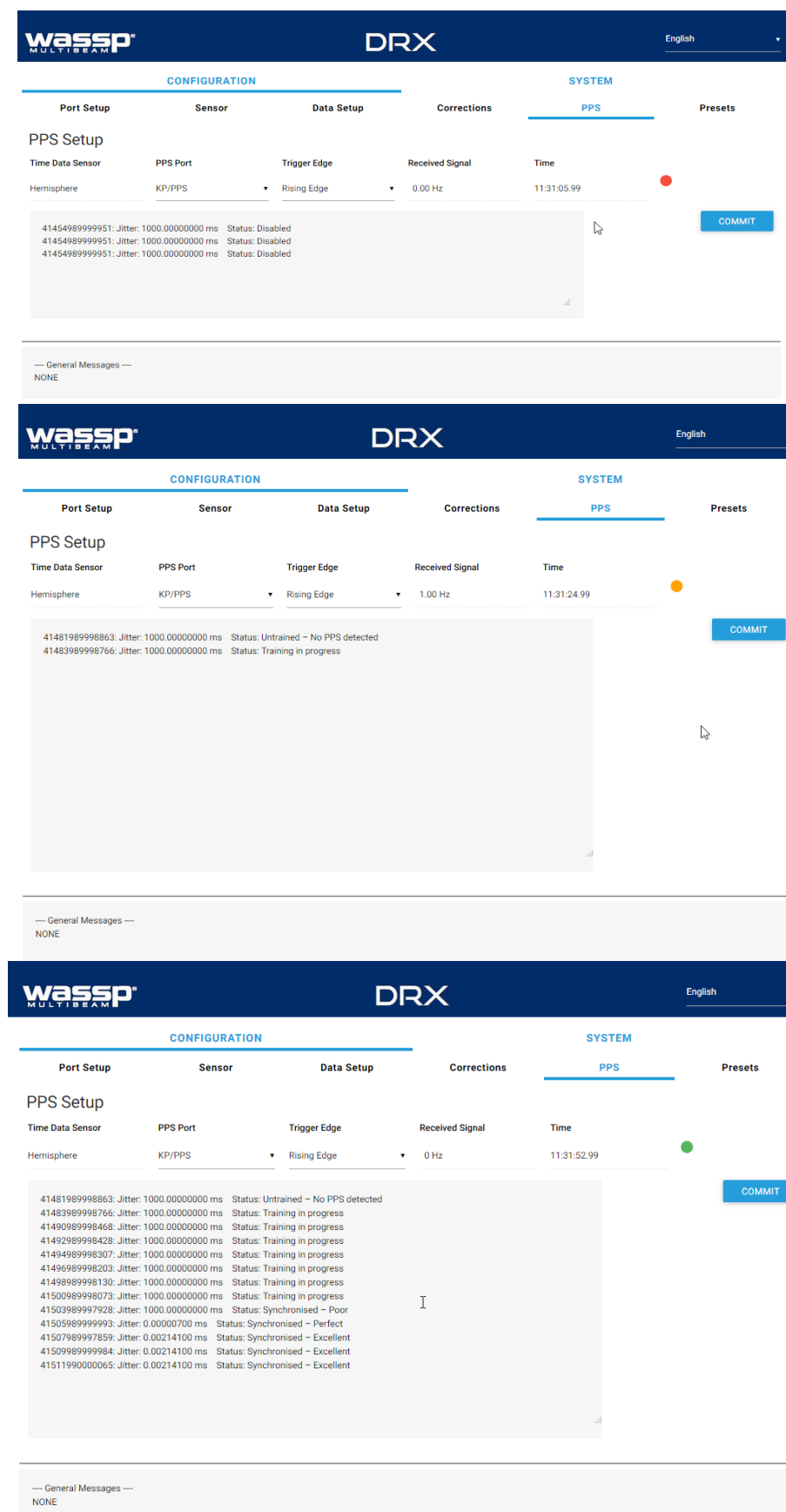


Figure 22. PPS Status

With PPS operating correctly status indicator will remain on green.

### 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).

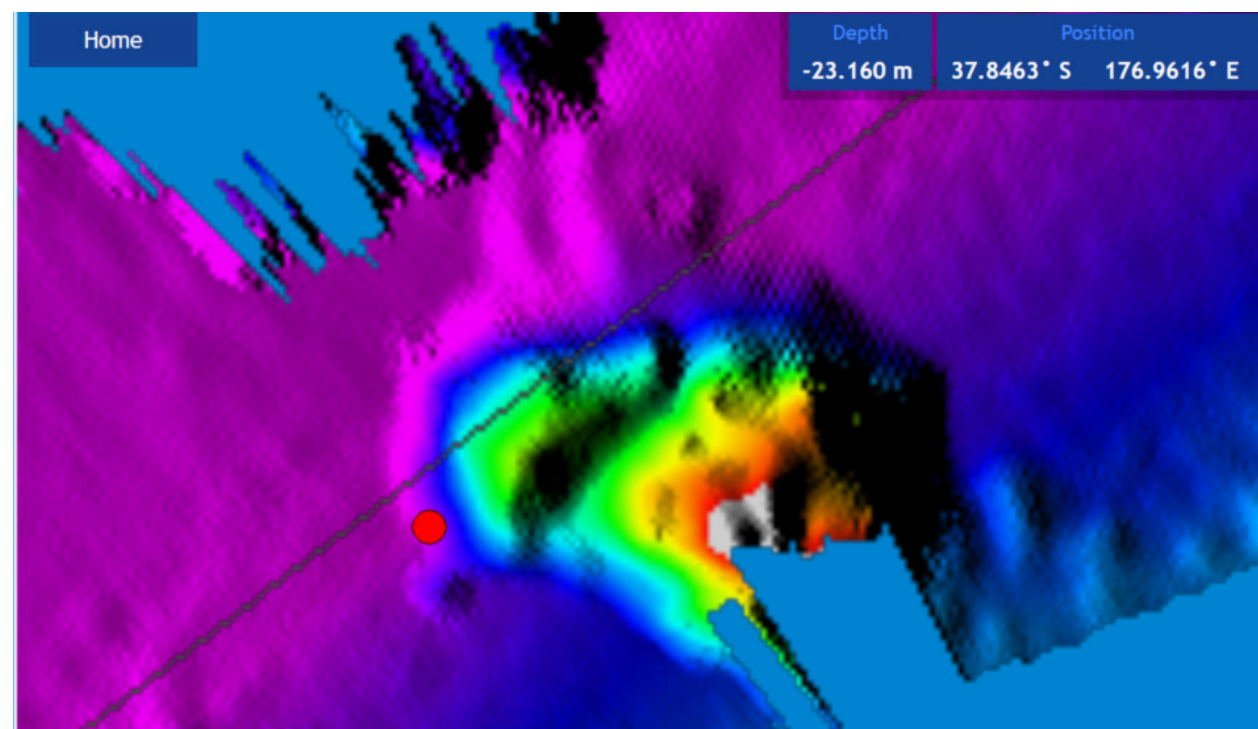


Figure 23. GPS Time Delay Stage 1

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

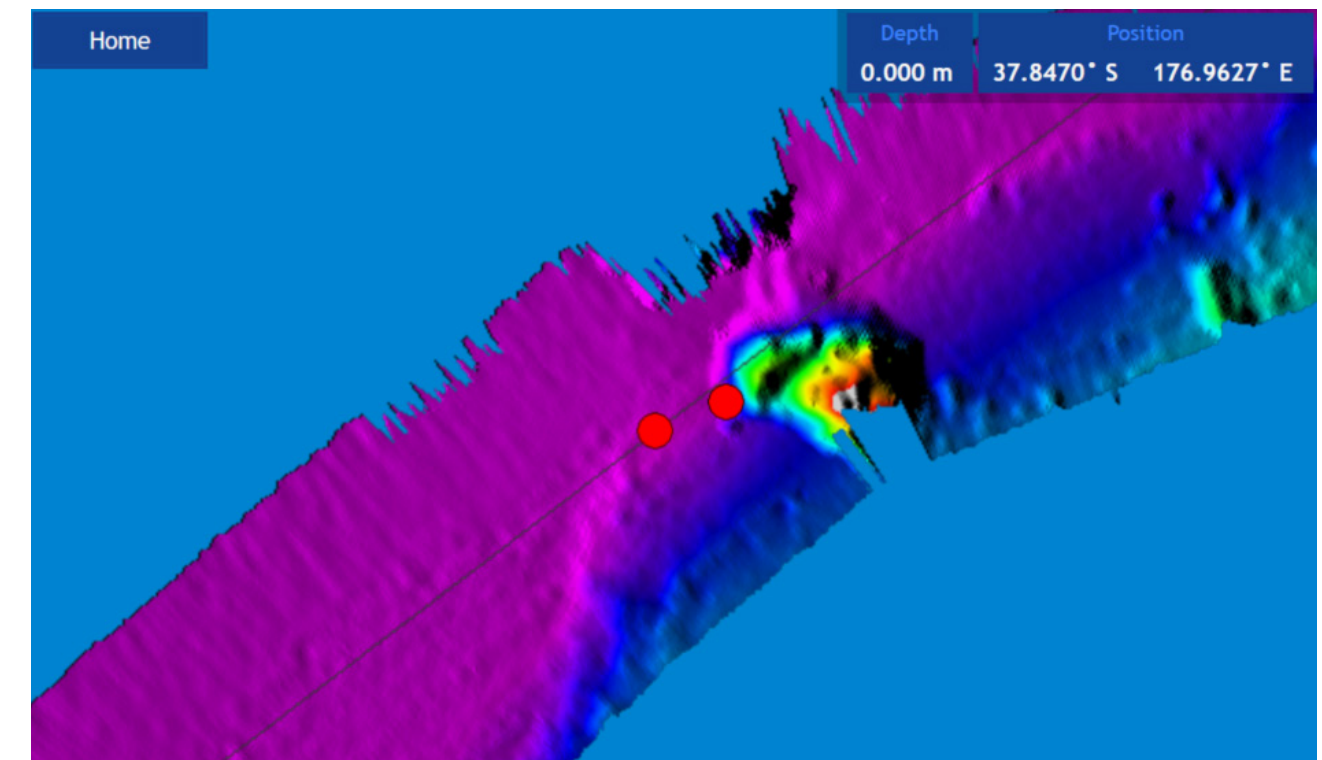


Figure 24. GPS Time Delay Stage 2

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.

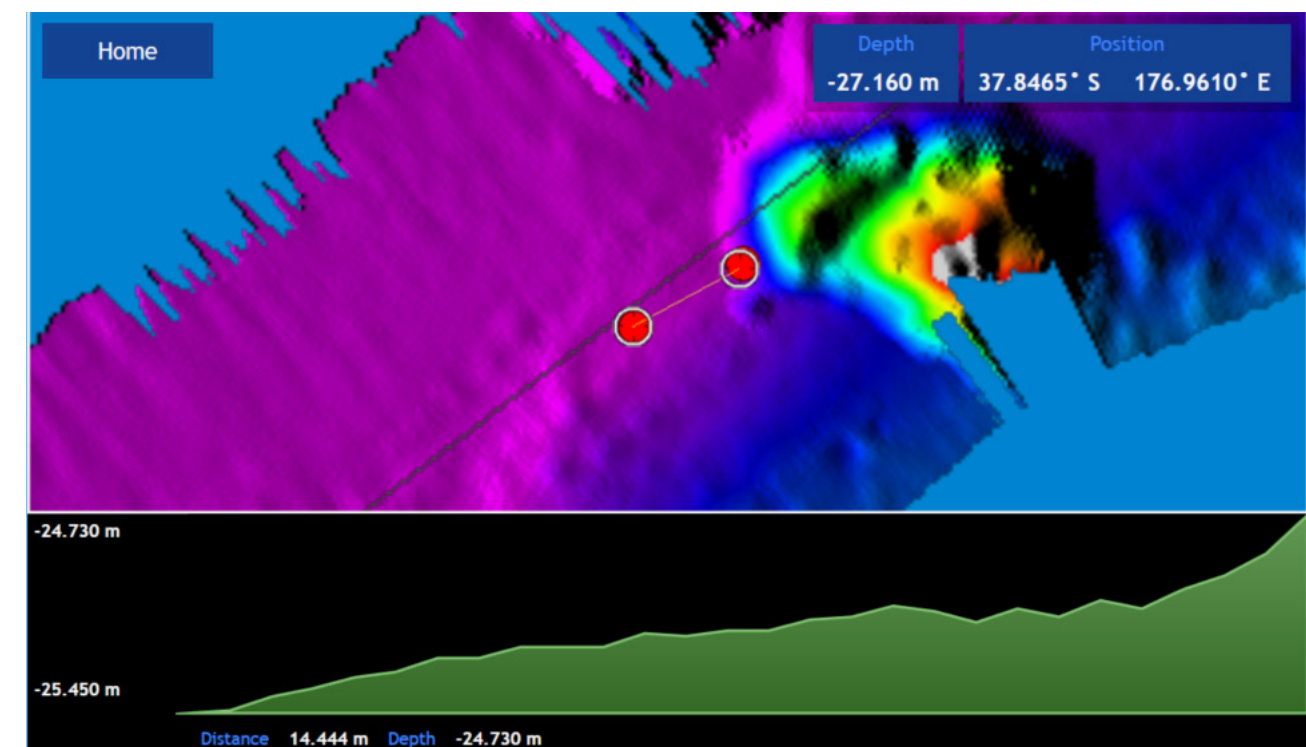


Figure 25. GPS Time Delay Stage 3



The formula below outlines this process.

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

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 35.

## 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:

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

## 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.

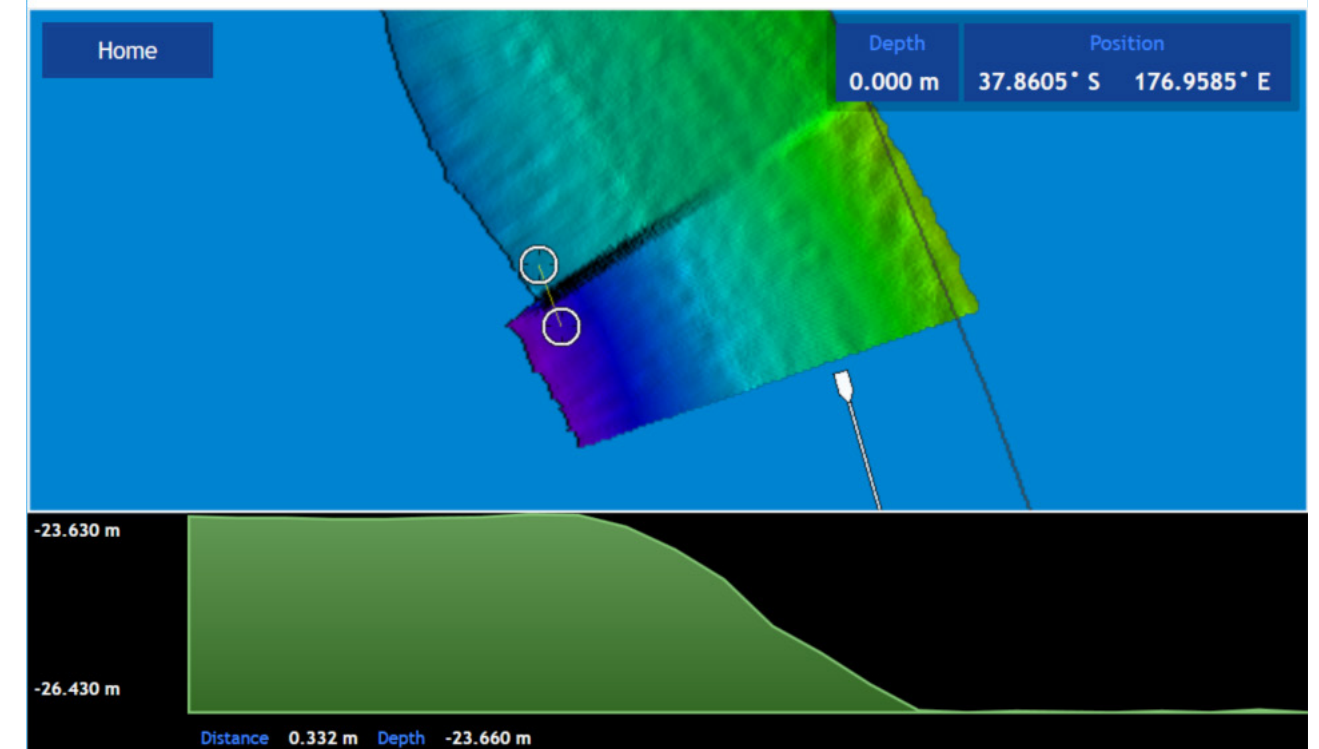


Figure 26. Manual Roll Patch Test



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).

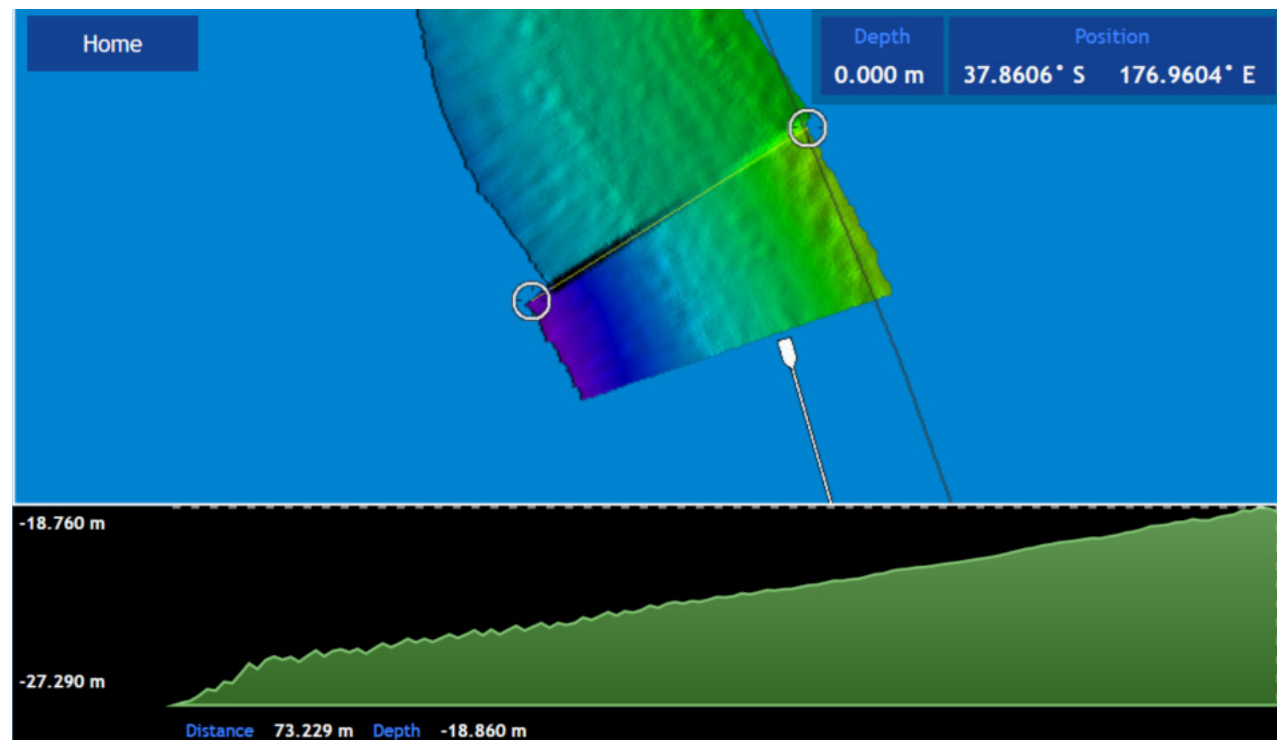


Figure 27. Measurement of Swath Width H



**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  $\tan(\alpha)$  ( $D/H$ ) 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<sup>-1</sup>'
  - 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 35.
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 40 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 35.

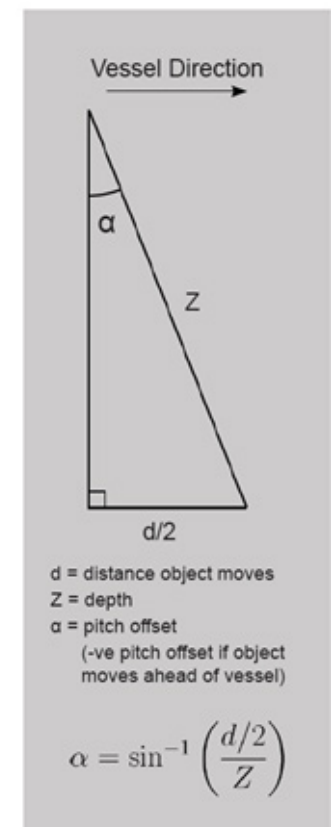


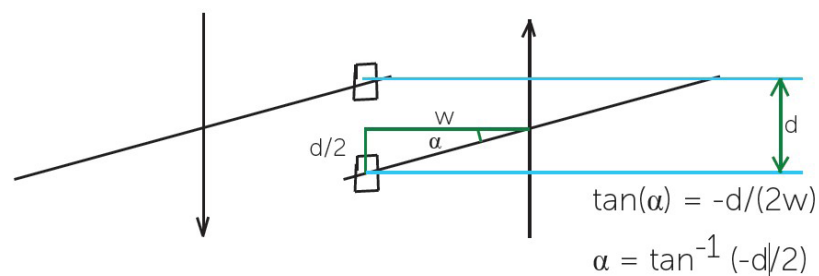
Figure 28. Pitch Corrections

### 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.



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

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

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

4. Enter the calculated value for  $\alpha$  into the Heading Offset in the [DATA SETUP](#) section of the [DRX SETUP WEBPAGES](#). See "5.2.4. Data Setup Tab" on page 35.

### 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.

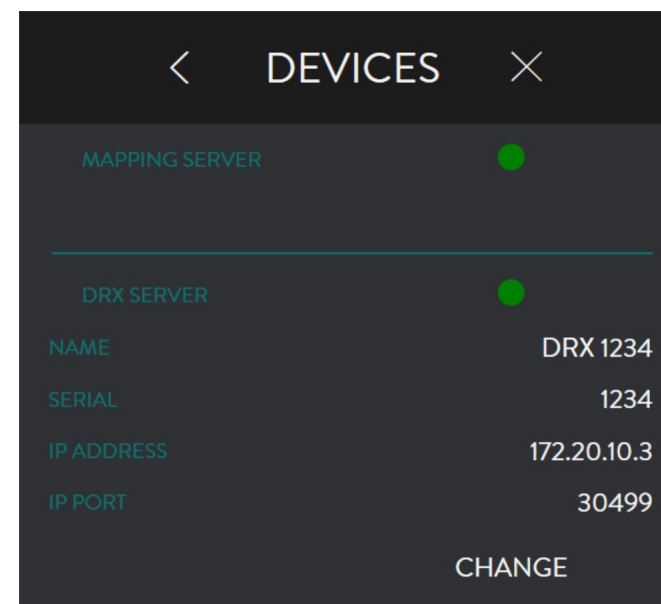
1. After installing WASSP CDX on your PC, start the DRX and run [WASSP CDX](#).
2. WASSP CDX will automatically select the DRX as long as the network has been correctly configured.
3. To manually select the DRX you wish to connect to:



Open the [HOME](#) menu and select [DEVICES](#).

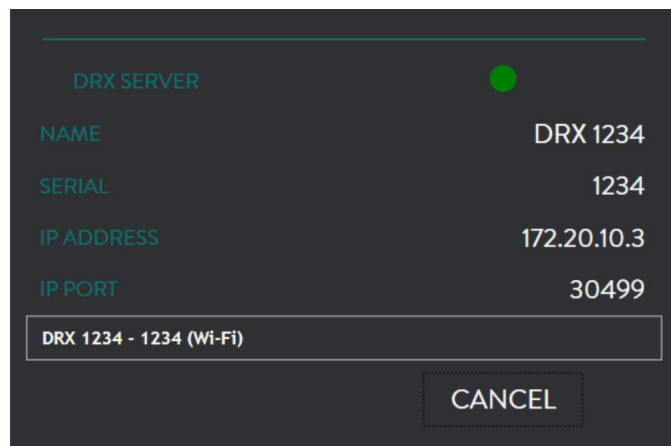


NOTE: Navigation to [DEVICES](#) will depend on CDX version.



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



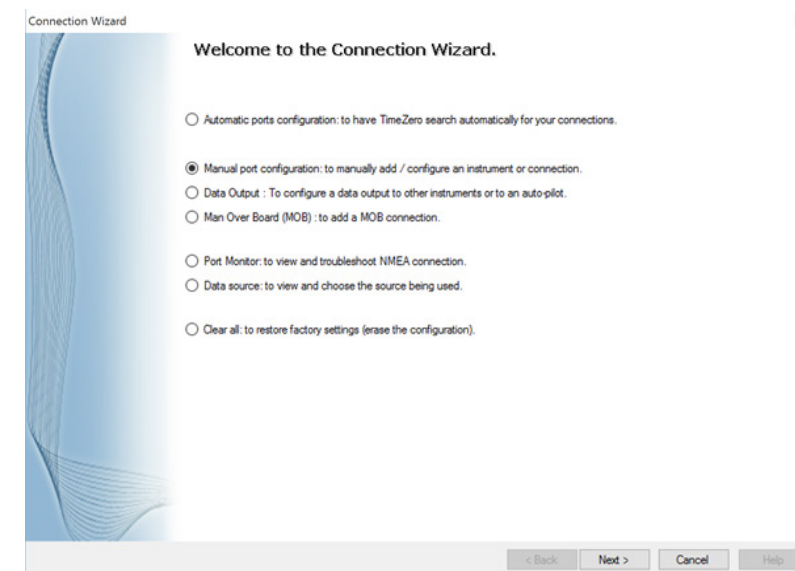
NOTE: Refer to WASSP CDX Operators Manual for more details.

## 6.2. CONNECTING MAXSEA TIMEZERO PLOT TO THE DRX

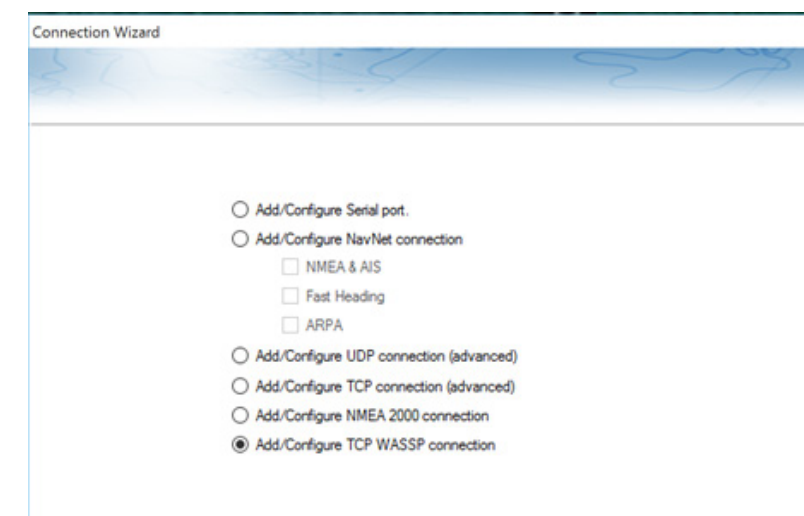
TimeZero Plot needs to be purchased from Maxsea, see <http://www.maxsea.com/products/software>

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'.

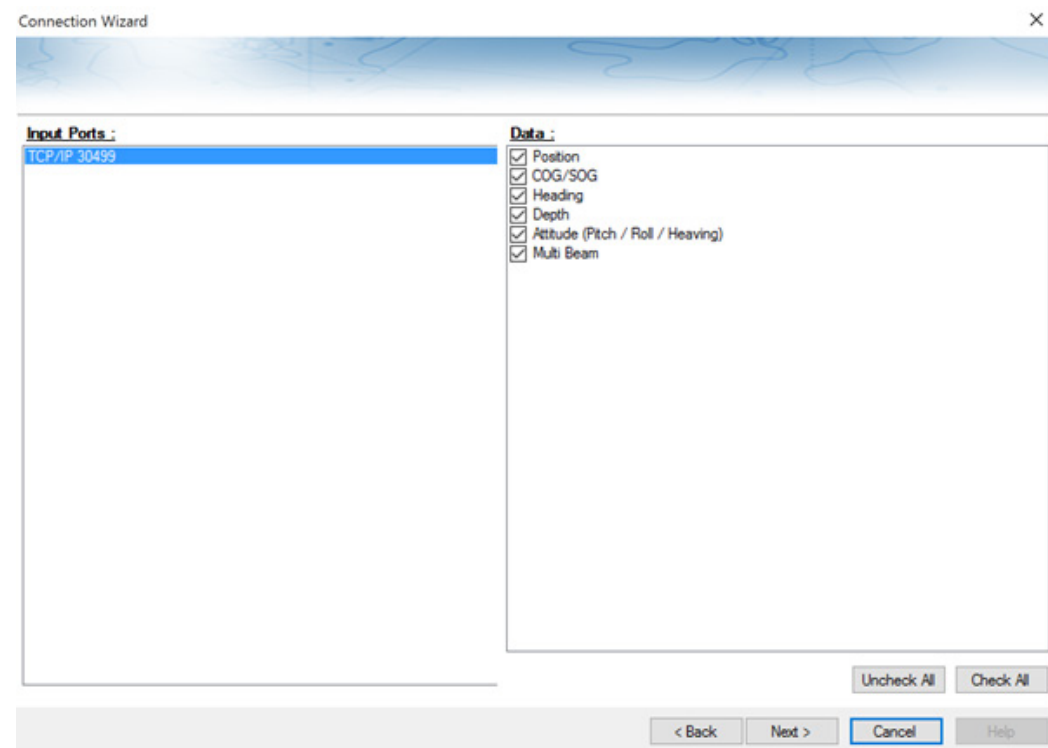


4. Enter in the IP address of the DRX and the TCP port (default is 55555).



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

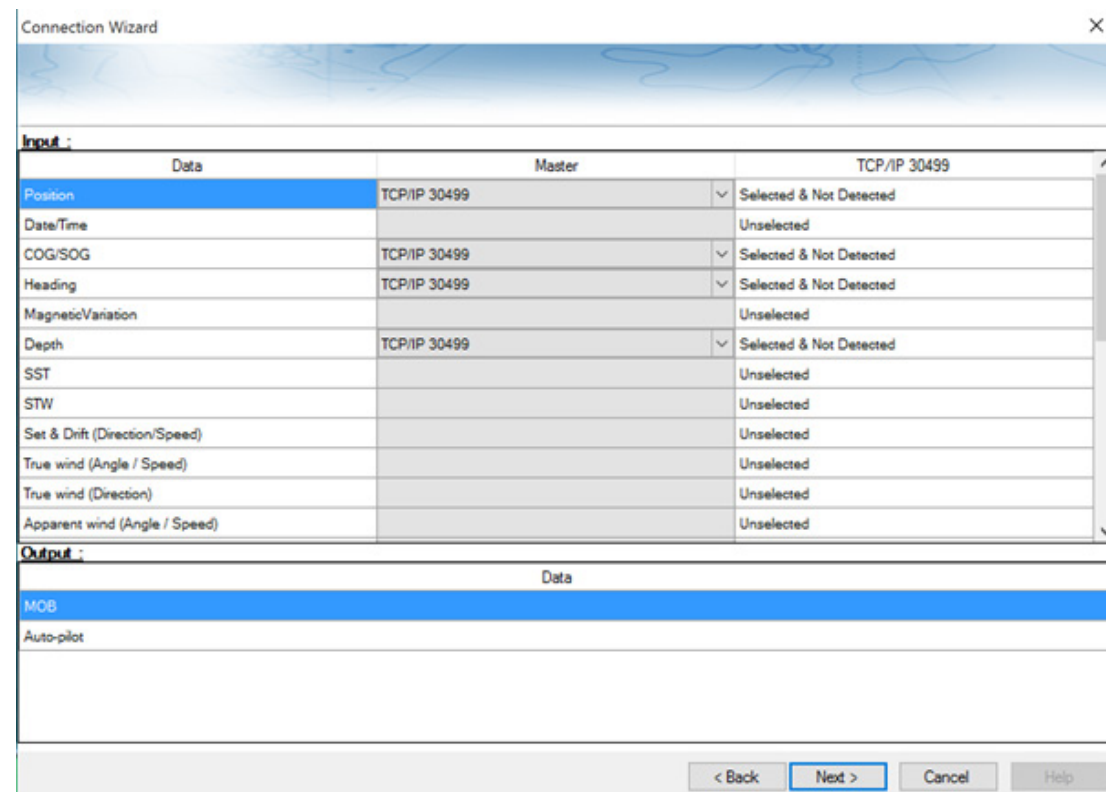
5. The TZ Professional software should find all the data being output from the DRX. If not, recheck your network settings.



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.



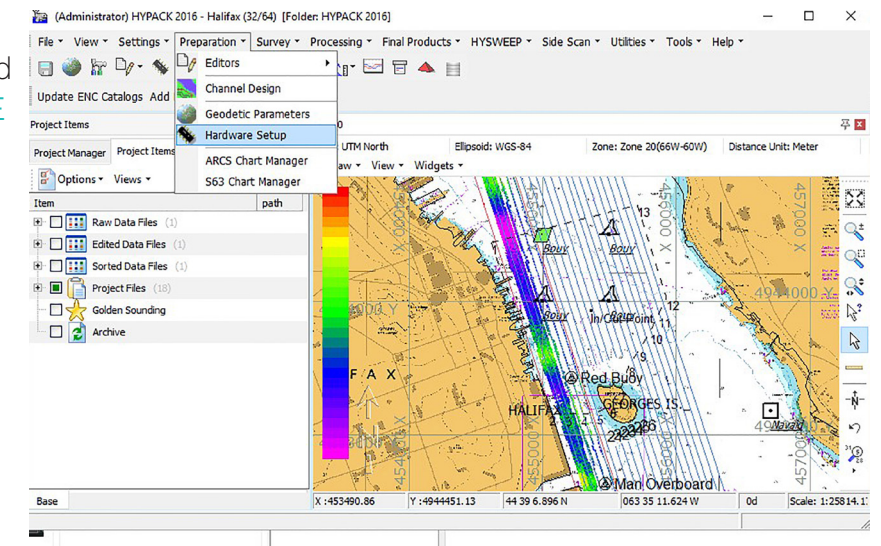
7. To begin logging on to TZ Professional software, ensure that PBG icon is enabled.

## 6.3. CONNECTING HYPACK TO THE DRX

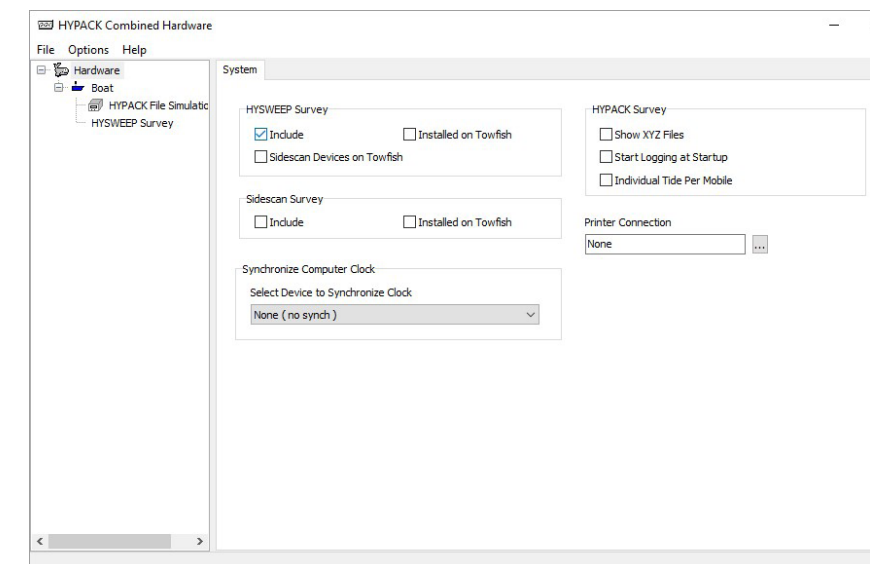
HYPACK needs to be purchased from your local HYPACK dealer. See [www.hypack.com](http://www.hypack.com) for details.

Install HYPACK 2016. Refer to HYPACK manual for details.

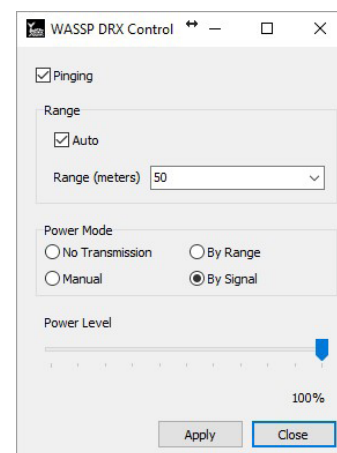
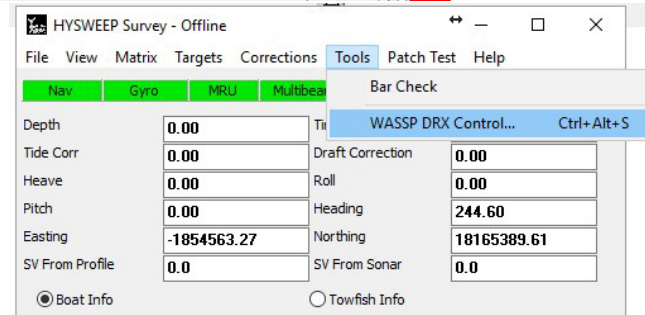
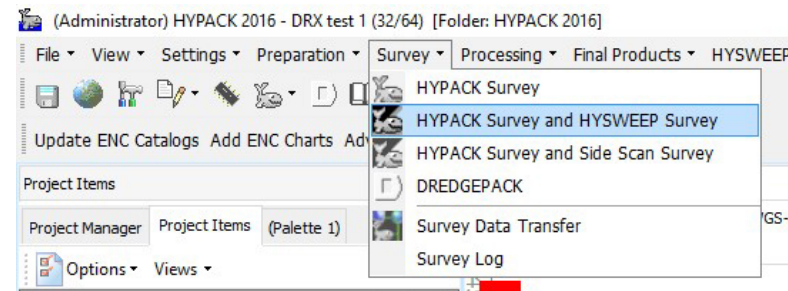
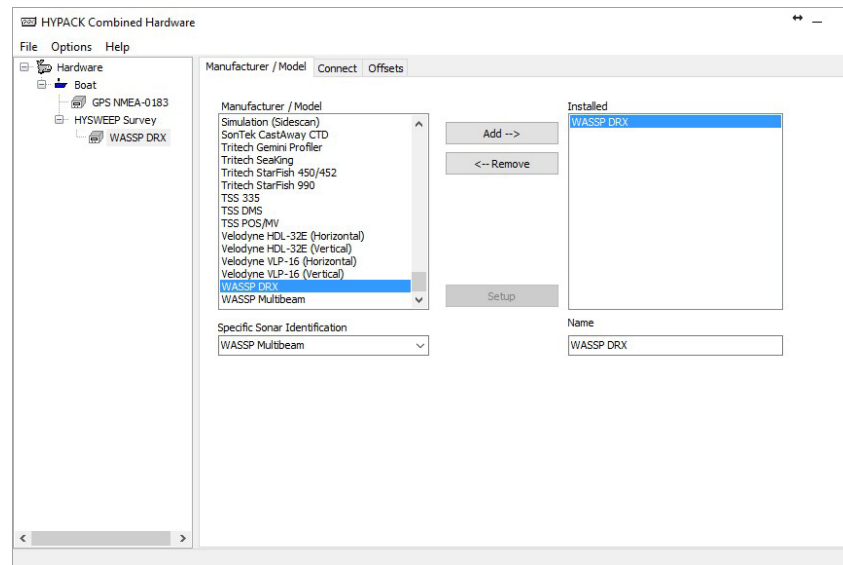
- Go to **PREPARATION** and select **HARDWARE SETUP**.



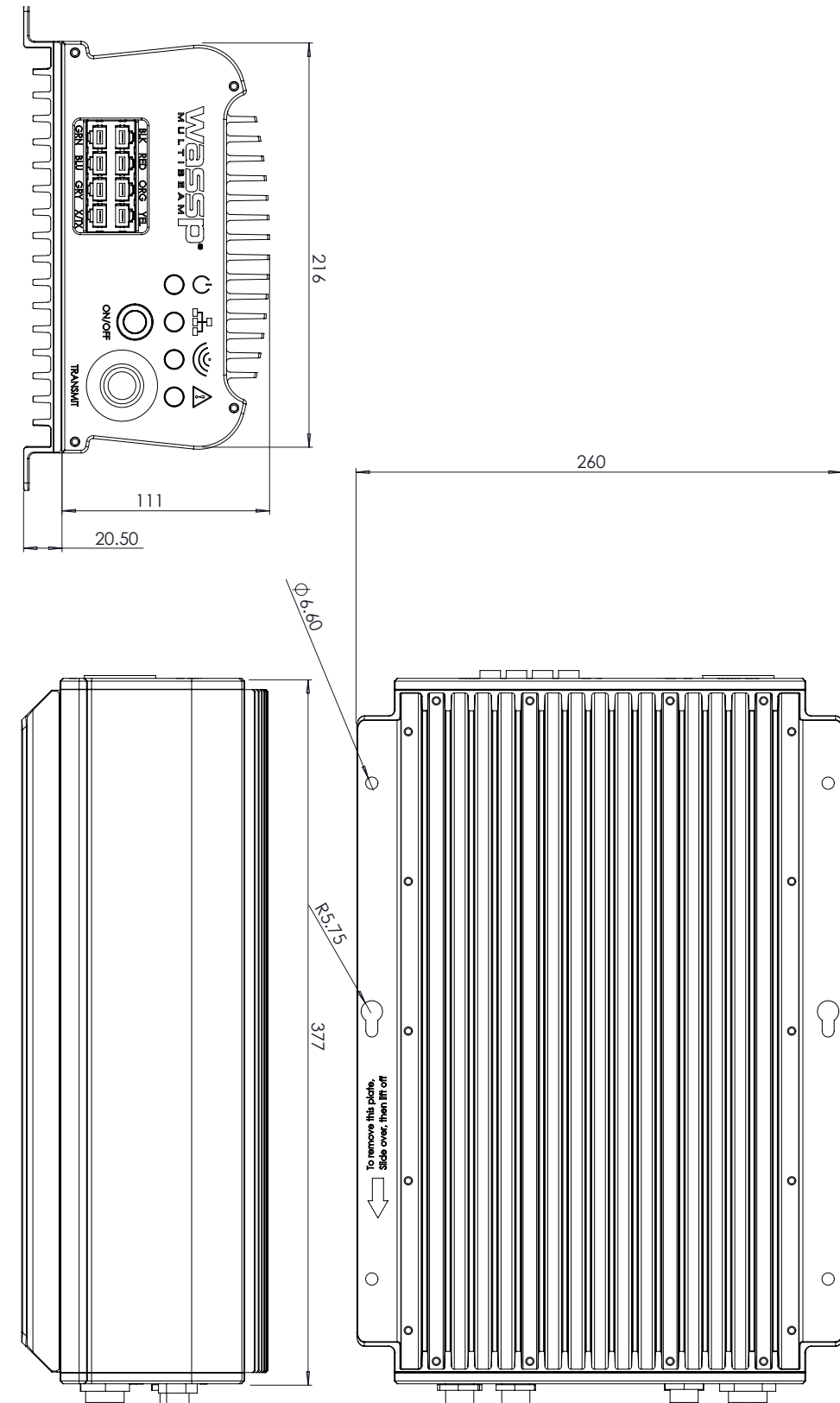
- INCLUDE** HYSWEEP Survey.



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.



## 7 OUTLINE DRAWINGS



NOTE: Offsets recorded under "5.1. Commissioning Step 1: Ship Measurements" on page 30 need to be applied in HYPACK directly.



Figure 29. DRX Dimensions

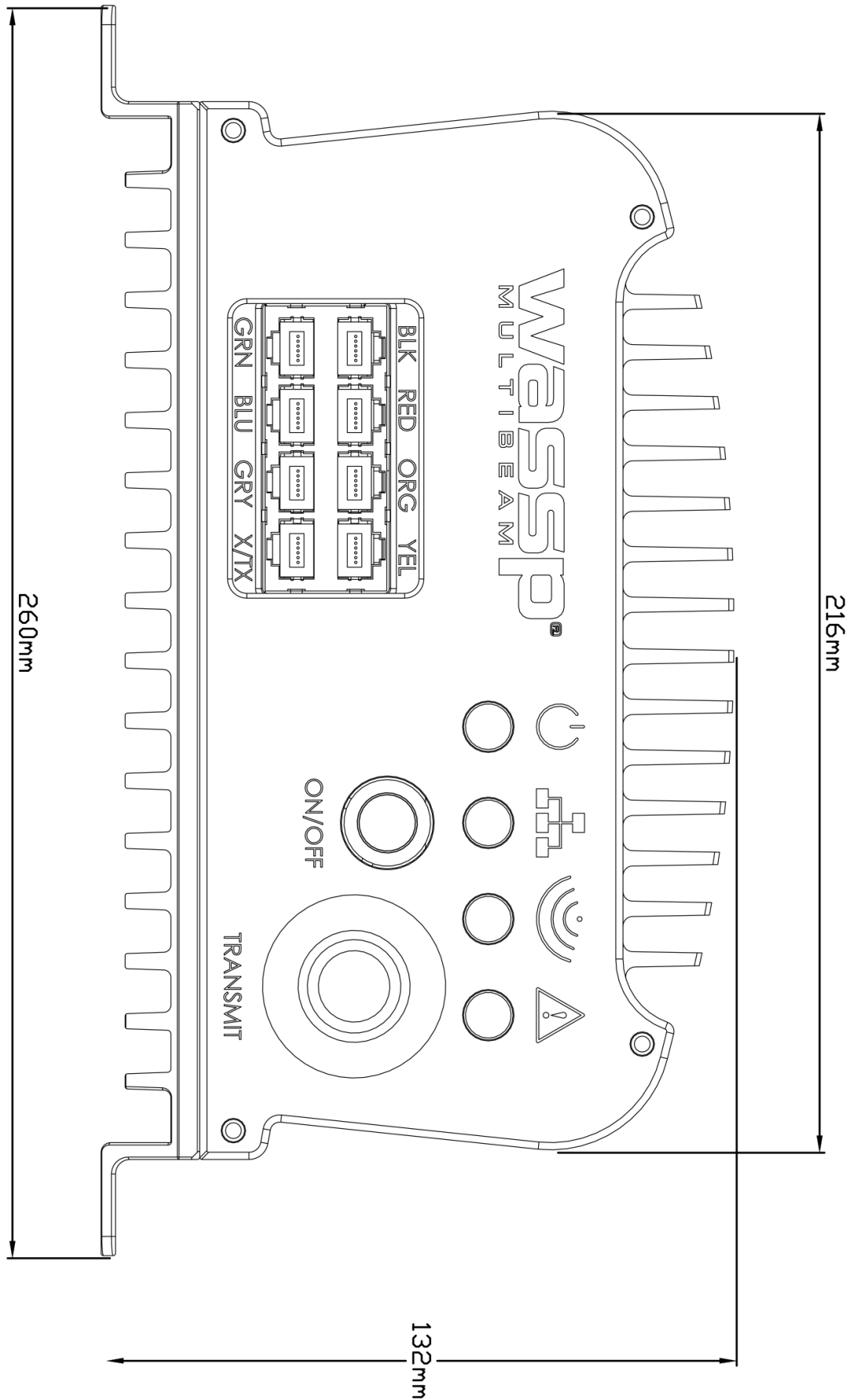


Figure 30. Front Plate

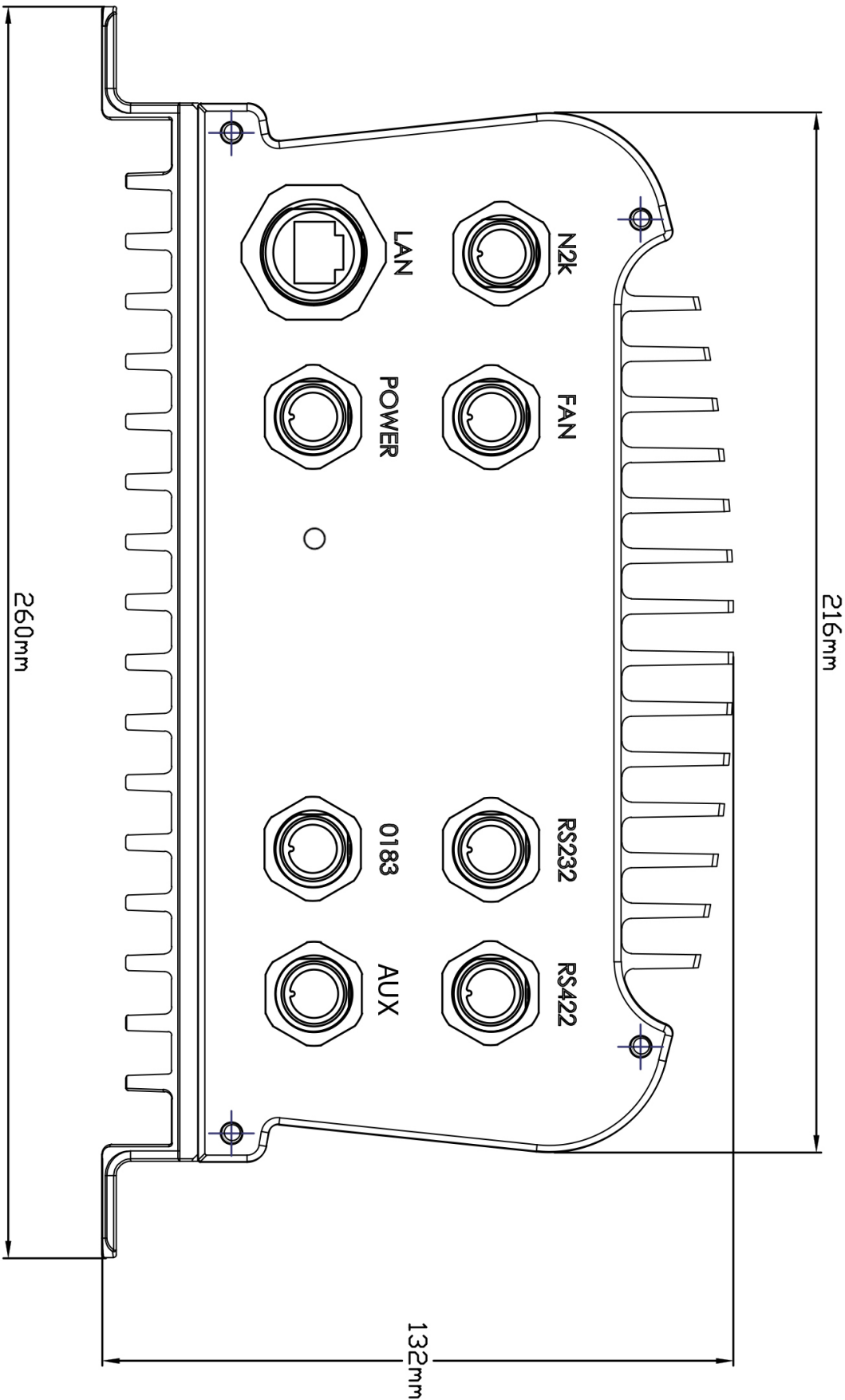


Figure 31. Back Plate



## 8 DRX INTERCONNECTION

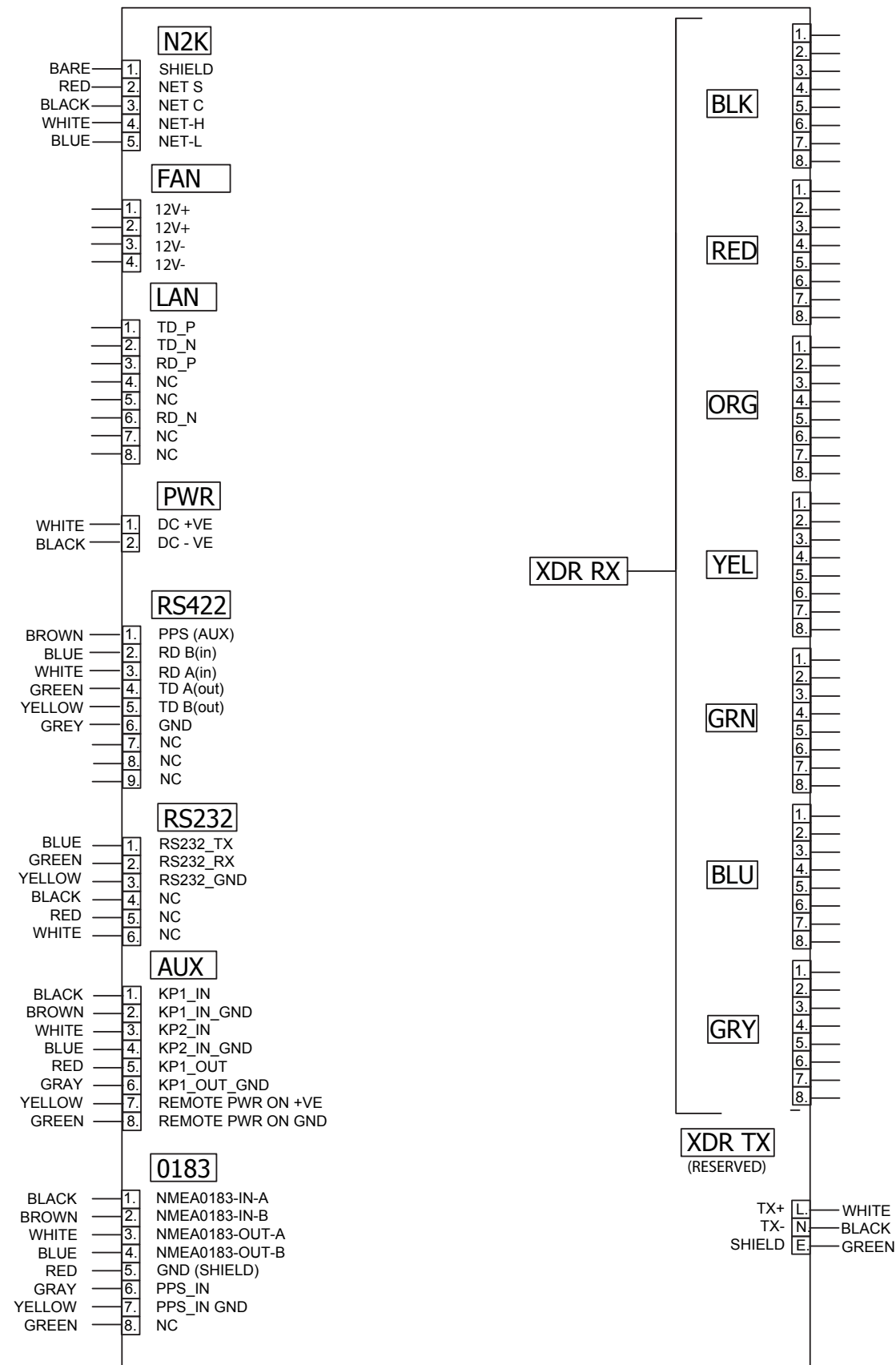


Figure 32. Interconnection Diagram

## 9 TECHNICAL SPECIFICATIONS

### DRX Spec Sheet

System	
- Frequency	Variable, Wideband, Transducer Dependent
- Signal Type	DRX, WSP-603-20X; FM DRX-46, WSP-603-300; FM/CW
- Tx Type	DRX, WSP-603-20X; Full Digital DRX-46, WSP-603-300; Digital
- Ping Rate	Automatic, depth determined; Maximum 50Hz
- Depth Range	Transducer and environmental dependent. Nominally: DRX, WSP-603-20X; 1-150m DRX-46, WSP-603-300; 1-300m (WMB160), 1-600m (WMB80)
-Range Resolution	Nominal 3.9cm
I/O Interface	
- Ethernet	GbE
- Serial	RS-232, RS-422, NMEA 0183
- CAN	NMEA 2K
- Analog	KP in x2, KP out, PPS
- Other	Remote Power Control, Power out 12V x2 (model dependent)
Data Formats	
- Input Sentences	See "Appendix B - Supported Sensors and Sentences" on page 69
- Output Sentences	See "Appendix B - Supported Sensors and Sentences" on page 69
- Output Data types	See WASSP DRX ICD (Interface documentation for DRX and associated DRX SDK/API documentation)
Power	
- Power Supply	DC Input, 9-32V DC
- Power Consumption (max)	DRX, WSP-603-20X; 25W DRX-46, WSP-603-300; 50W
Mechanical	
- Dimensions	377mm(L) x 260mm(W) x 132mm (H)
- Weight	8.3kg
- Mounting	Bulkhead or Flat
Environmental	
- Operating Temperature*	DRX, WSP-603-20X; 0°C to 50°C DRX-46, WSP-603-300; 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	*IEC60945 Sweep 2 Hz – 13,2 Hz at ± 1 mm, 13,2 Hz – 100 Hz at 7 m/s <sup>2</sup> and for 2 h on each resonance, otherwise 2 h at 30 Hz in all three axes"
- Shock	MIL-STD-901, Grade B, Class II
- EMC	IEC60945

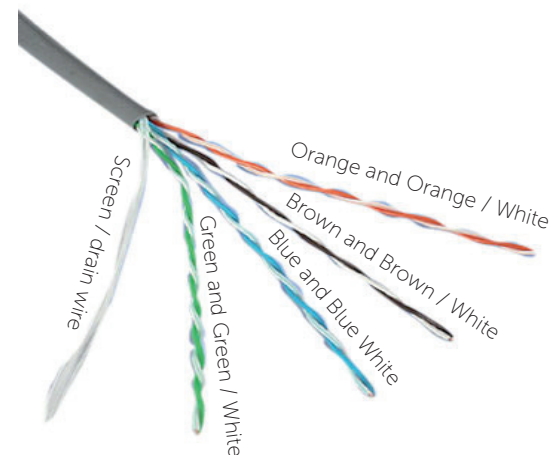
\*Extending the operating temperature to 0°C to 50°C by using the optional external fan mount

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

## 10 APPENDIX

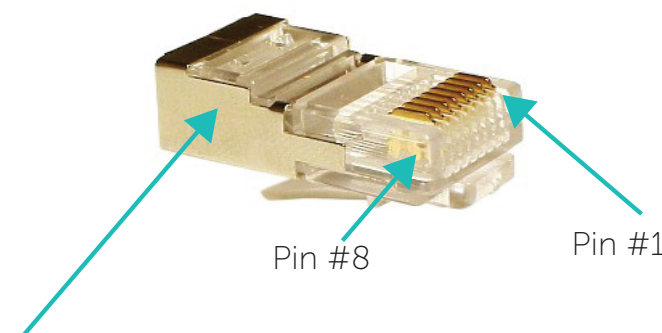
### APPENDIX A - CABLE DRAWINGS

#### APPENDIX A.1 TRANSDUCER RX

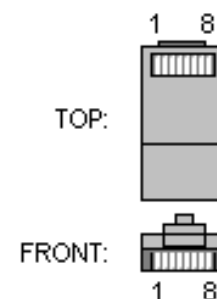


The CAT5E cables used in the transducer cable follow standard CAT5 colour codes but the RJ-45 plug wiring is specific to the DRX and does NOT conform to T568A or B.

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)

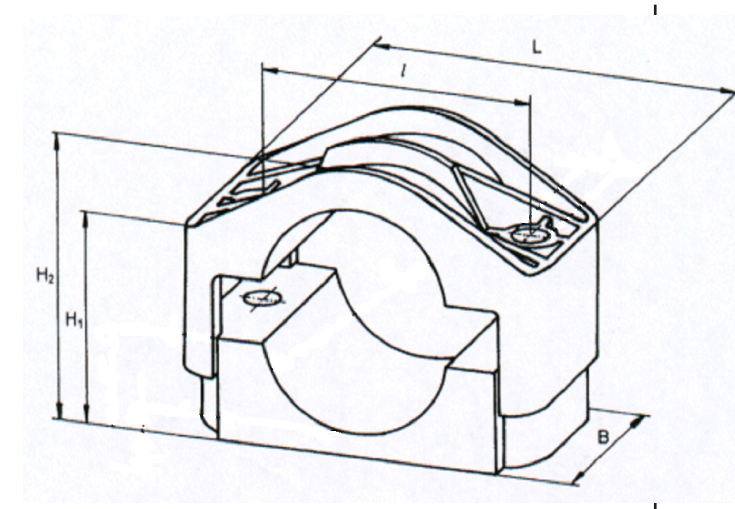


The screen / drain wire should be soldered on to the side of the RJ-45 connector. Scratch the side of the connector with something sharp before soldering to assist with the join.



#### 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.



H1	H2	L	L	B
34-46	45-57	60	90	60

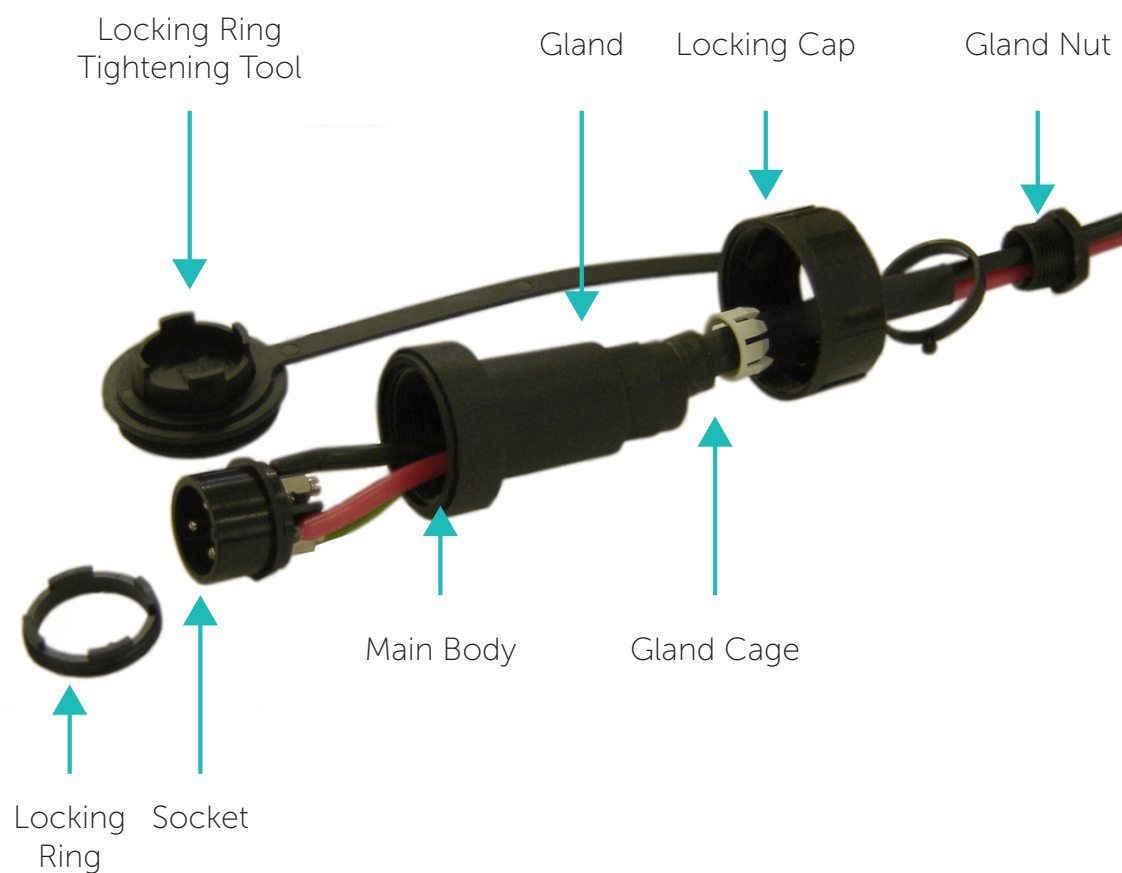
## APPENDIX A.3 TRANSDUCER TX

### Transmitter Cable Socket Assembly

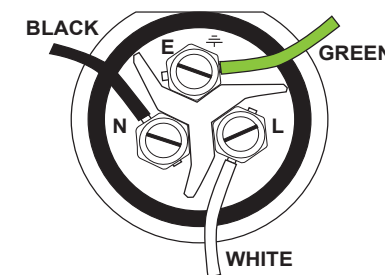
If the transmitter cable socket needs to be disassembled, use the locking ring tightening tool (supplied with the DRX) to loosen the locking ring. To assemble the 3-pin sealed plug:

1. Push the following parts over the transmitter wires:

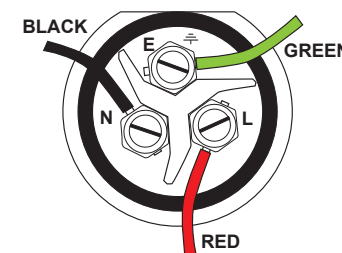
- Gland Nut
- Gland Cage
- Gland
- Main Body



2. 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.

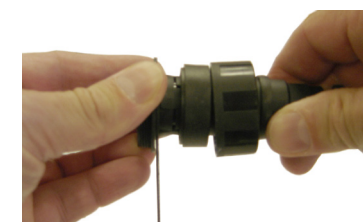


Later Cable Colour Code



Early Cable Colour Code

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



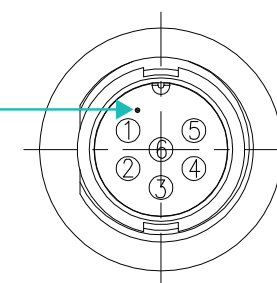
Tightening tool

## APPENDIX A.4 RS-232

### Connector RS-232

PIN	Function
1	RS-232_TX
2	RS-232_RX
3	RS-232_GND
4	
5	
6	

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



### Example Connection:

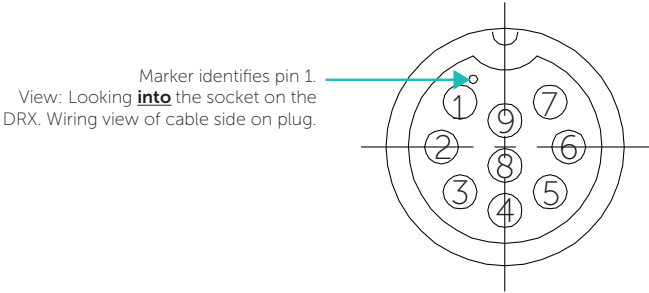
1	RS-232_TX		RS-232_TX
2	RS-232_RX		RS-232_RX
3	RS-232_GND		RS-232_GND
4			
5			
6			

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

APPENDIX A.5 RS-422

Connector **RS-422**

PIN	Function
1	PPS (AUX)
2	RD B (IN + )
3	RD A (IN - )
4	TD A (OUT - )
5	TD B (OUT +)
6	GND
7	
8	
9	



Example Connection:

1	PPS (AUX)	←	PPS OUT
2	RD B (IN + )	←	TD B (OUT + )
3	RD A (IN - )	←	TD A (OUT - )
4	TD A (OUT - )	→	RD A (IN - )
5	TD B (OUT +)	→	RD B (IN + )
6	GND	←	PPS OUT GND
7			
8			
9			

- » Isolation; Fully electrically isolated
- » Cable; Multi core or multi core screened with tinned copper conductors
- » Shield; If using should be connected at far end

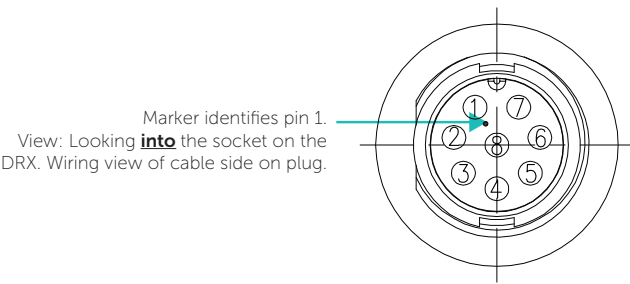


NOTE: Depending on sensor compliance, this may be used as direct NMEA 0183 input

APPENDIX A.6 NMEA 0183

Connector **0183**

PIN	Function
1	NMEA 0183_IN A
2	NMEA 0183_IN B
3	NMEA 0183_OUT A
4	NMEA 0183_OUT B
5	GND (Shield)
6	PPS_in
7	PPS_in GND
8	



Example Connection:

1	NMEA 0183_IN A	→	NMEA 0183_IN A
2	NMEA 0183_IN B	→	NMEA 0183_IN B
3	NMEA 0183_OUT A	→	NMEA 0183_OUT A
4	NMEA 0183_OUT B	→	NMEA 0183_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 or multi core screened with tinned copper conductors.



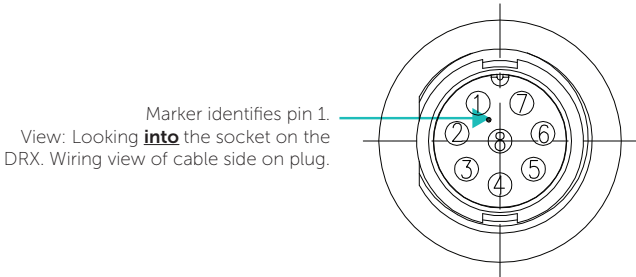
NOTE: A second NMEA 0183 input can be wired if required. Consult your dealer on specification.



APPENDIX A.7 REMOTE POWER

Connector **AUX**

PIN	Function
1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND



Example Connection:

1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND

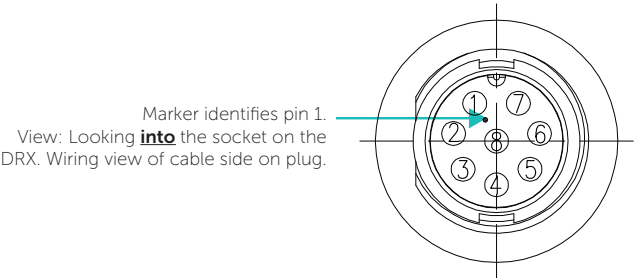


APPENDIX A.8 KP1/KP2 IN

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	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND



Example Connection:

1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND

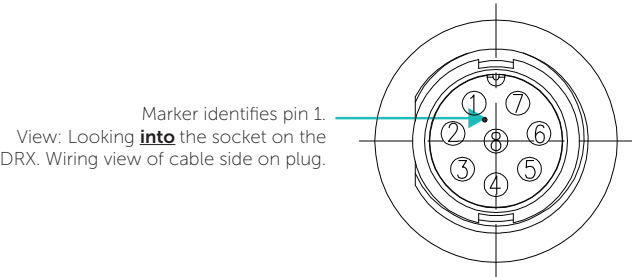


- » Isolation; Fully electrically isolated
- » Drive; Selectable as high, low or auto

APPENDIX A.9 KP1 OUT

Connector **AUX**

PIN	Function
1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND



Example Connection:

1	KP1_in
2	KP1_in_GND
3	KP2_in
4	KP2_in_GND
5	KP1_OUT
6	KP1_OUT_GND
7	REMOTE_PWR_ON
8	REMOTE_PWR_ON_GND

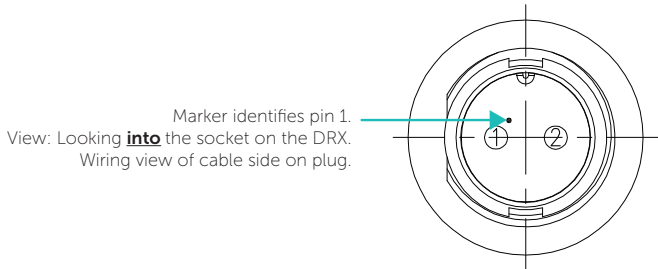


» Isolation; Output isolation, if required, should be at receive end

APPENDIX A.10 POWER CONNECTION

Connect the cable assembly to 9 - 32V 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;**  
Peak current at 12V is 3A  
Peak current at 24V is 1.5A  
Recommended 5A to 10A Breaker  
**DRX WSP-603-300;**  
Peak current at 12V is 10A  
Peak current at 24V is 5A  
Recommended 15A Breaker

APPENDIX A.11 ETHERNET

Standard Gigabit Ethernet.

Std T568A wiring:

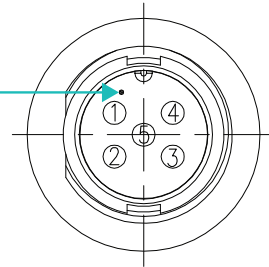
1	TP1+
2	TP1 -
3	TP2 +
4	TP3 +
5	TP3 -
6	TP2 -
7	TP4 +
8	TP4 -

## APPENDIX A.12 NMEA2K

Connector **N2K**

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

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



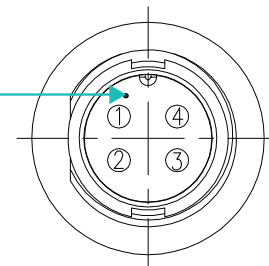
- » Isolation; Fully electrically isolated
- » Standard DeviceNet, "NMEA 2000 Approved"

## APPENDIX A.13 FAN

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 -

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



- » 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 Suggestions
Furuno SC30/SC50	Position and heading via IF-NMEASC Interface unit <i>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.</i>
SMC IMU-108	Roll, pitch, heave, TSS sentence
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

Table 2. Supported Sensors

NMEA / Serial Sentence	Description
PFEC ATT	True heading (Furuno proprietary sentence)
GGA	Global positioning system (GPS) fix data.
GLL	Geographic position, Latitude and Longitude
HDG	Magnetic Heading
HDT	True Heading
ZDA	Time and date
TSS/TSS1	Roll, pitch, heave
PTNL GGK	Trimble Geographic Position

Table 3. Supported NMEA / Serial Sentences

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.

## APPENDIX C - 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](http://wassp.com).

DRX technical support is available directly through:

- » Email: [support@wassp.com](mailto:support@wassp.com)
- » Online: <http://wassp.com/support/> and click on 'Request Support'

## LATEST RESOURCES

- » For the latest version of manuals: <http://wassp.com/manuals/>
- » For software updates and release notes: <http://wassp.com/software-updates/>
- » For System drawings, mechanical drawings and declarations of conformity: <http://wassp.com/dealer-resources/>

## YOUR NOTES



