

UM-8315

User Manual for the Type 8315 iWAND

Issue B Rev 2

Issue Date: 12 February 2016

© 2013 Sonardyne International Limited. All rights reserved.

This user manual is the copyright and intellectual property right of Sonardyne International Limited ("Sonardyne") and is provided solely for the customer's use of the Sonardyne equipment as described in this user manual and in accordance with Sonardyne's then prevailing terms and conditions of sale. This user manual has been compiled to the best of Sonardyne's knowledge and belief, but no representation, warranty (whether express or implied) or guarantee is made to any persons or legal entities as to the accuracy, reliability or completeness of the information contained in this user manual.

This user manual contains the proprietary, confidential information of Sonardyne and other third parties and as such may not be used, disclosed or placed in the public domain (by whatever means) by the customer except expressly in accordance with and subject to the above referenced terms and conditions of sale.

The copyright and any and all intellectual property rights of any and all third parties which may be referenced in this user manual or which may have provided proprietary products and/or software and/or documentation (in whatever format) to Sonardyne in respect of the Sonardyne equipment as described in this user manual are hereby duly acknowledged. The provision of any and all such products and/or software and/or documentation by Sonardyne shall be subject to and in accordance with the relevant third parties' terms and conditions or the Sonardyne then prevailing conditions of sale, as appropriate.

The Sonardyne equipment described in this user manual is protected by various UK and US Patents and other patents internationally and registered trademarks of Sonardyne International Limited.

Contacting the Sonardyne Support Team

24-hour Emergency Telephone Helpline: +44 (0) 1252 877600

The Sonardyne 24-hour helpline is answered at the UK Headquarters during normal office hours (08:00 to 17:00). Outside these hours, your call is automatically transferred to an agency, which logs the details of your emergency and alerts the appropriate Sonardyne personnel.

Our aim is to make sure emergency requests are dealt with immediately during office hours, and are responded to within 30 minutes at all other times.

Please note the helpline is for emergency use only.

If you require non-emergency product support, please contact your nearest Sonardyne office. Alternatively, contact the Sonardyne Head Office:

Sonardyne International Ltd
Blackbushe Business Park
Yateley
Hampshire
GU46 6GD
United Kingdom

Telephone: +44 (0) 1252 872288

Fax: +44 (0) 1252 876100

Email: support@sonardyne.com

Note



Email and telephone support is available during normal UK office hours (08:00 to 17:00).

Contents

Contacting the Sonardyne Support Team.....	iii
Amendment History.....	viii
Section 1 – Introduction	1
1.1 Scope of this Manual	1
1.2 Purpose of this Manual	1
1.3 Related Publications	1
1.4 Conventions.....	1
Section 2 – Safety	2
2.1 Introduction.....	2
2.2 Safety Procedures	2
2.2.1 Warnings.....	2
2.2.2 Cautions.....	2
Section 3 – Technical Description	3
3.1 Introduction.....	3
3.2 Hardware Description	3
3.2.1 Battery and Charging	3
3.2.2 Communications	4
3.2.3 User Interface	4
3.2.4 Transducer Connector	6
3.2.5 USB Connector	6
3.2.6 9-way ‘D’ connector.....	6
3.2.7 Endcap Connector Cover	7
3.2.8 GPS	7
3.2.9 Power Modes	7
Section 4 – Connection and Setup	9
4.1 Introduction.....	9
4.2 Charging the iWAND	9
4.3 Setting the iWAND Time.....	9
4.4 Connecting to the iWAND	10
4.4.1 Bluetooth.....	10
4.4.2 USB	15
4.4.3 RS232/RS485 Connection	18
4.5 iWAND Setup	19
4.5.1 iWAND Information	19
4.5.2 Time Information	20
4.5.3 Communications	20
4.5.4 User Interface	20
4.5.5 Power Saving.....	22
4.5.6 Discovery Options.....	23
4.5.7 ABOP Mode	25

4.5.8	Transponder Mode.....	26
4.5.9	Accessories.....	27
Section 5 – Operation		29
5.1	Introduction.....	29
5.2	Menu System.....	29
5.3	Prerequisites for Operation	29
5.4	Ping Check	30
5.5	Quick Check	32
5.5.1	Acoustic Settings	33
5.5.2	Battery Status	33
5.5.3	Firmware Information	34
5.5.4	View Sensors	34
5.5.5	Lodestar Support	35
5.5.6	Acoustic Check	39
5.5.7	HPR Check	39
5.5.8	Test Release.....	40
5.5.9	Acoustic Terminal	42
5.5.10	Predeploy Check.....	43
5.6	Get and Set Configuration	48
5.6.1	Get Configuration.....	48
5.6.2	Set Configuration	53
5.7	Tone Testing.....	57
5.7.1	Sonardyne WSM 6.....	57
Section 6 – Maintenance		61
6.1	Introduction.....	61
6.2	Scheduled Maintenance and Recalibration	61
6.3	General Maintenance	61
Section 7 – Functional Test.....		62
7.1	Running Self-Test.....	62
7.2	Running an External Unit Test	62
Section 8 – Firmware Upgrade.....		63
8.1	Introduction.....	63
8.2	Firmware Upgrade Procedure.....	63
Section 9 – Fault Diagnosis		70
9.1	General Operation	70
9.1.1	Unit Does Not Power On When a Key is Pressed on the Keypad.....	70
9.1.2	Unit Not Responsive	70
9.2	PC Communications	70
9.2.1	Bluetooth not Functional on Windows XP.....	70
9.2.2	USB not Communicating	70
9.2.3	Acoustic Communications	70
Section 10 – Storage.....		71

10.1 Storing the iWAND.....	71
Section 11 – Technical Specifications.....	72
11.1 Acoustics	72
11.2 External Power	72
11.3 Battery	72
11.4 Environmental.....	72
11.5 Mechanical	73
11.6 Firmware Requirements.....	73
Appendix A – Firmware History record	74
A.1 Firmware History Record	74
Appendix B – Windows 8 Driver Installation.....	75
B.1 USB Driver Installation on Windows 8.....	75
Definitions	78

Figures

Figure 3-1 8315 iWAND	3
Figure 3-2 Example LCD Display Screen.....	4
Figure 3-3 Scrolling Displays	5
Figure 3-4 Keypad	5
Figure 4-1 Mini USB Connection Point for Charging	9
Figure 4-2 GPS Enabled and Receiving a Signal.....	9
Figure 4-3 GPS Enabled / Disabled	10
Figure 4-4 Enabling Bluetooth.....	11
Figure 4-5 iWAND Driver Installation	16
Figure 4-6 iWAND Serial Output After a <BREAK>.....	19
Figure 4-7 iWAND Information	19
Figure 4-8 Time Information View	20
Figure 4-9 Colour Scheme – Standard.....	21
Figure 4-10 Colour Scheme – Green	21
Figure 4-11 Colour Scheme – Orange	21
Figure 4-12 Screen Power On Time Options	22
Figure 4-13 GPS Enable / Disable	22
Figure 4-14 Power On Time Before Entering Sleep Mode	23
Figure 4-15 LMF, MF and HMF Bands.....	24
Figure 4-16 Acoustic Bands	24
Figure 4-17 Sync Pin Options	25
Figure 4-18 ABOP Mode Selection	26
Figure 4-19 Quick Check with ABOP Mode enabled	26

Figure 4-20 Transponder Mode	26
Figure 4-21 Serial Terminal Startup View.....	27
Figure 4-22 Serial Terminal Command Response View.....	27
Figure 4-23 GPS Status View	28
Figure 4-24 Current Position View	28
Figure 5-1 Home Screen.....	29
Figure 5-2 Positioning the iWAND Against the Instrument Transducer	30
Figure 5-3 Acoustic Settings	33
Figure 5-4 Battery Status	33
Figure 5-5 Firmware Information	34
Figure 5-6 Sensors	34
Figure 5-7 Acoustic Check	39
Figure 5-8 Selecting Correct Mode for WSM 6.....	57
Figure 5-9 Interrogation Channel Selection.....	57
Figure 5-10 Sonardyne Tone Mode	59
Figure 5-11 HPR400 Mode	60

Tables

Table 1–1 Related Publications	1
Table 1–2 Conventions used in this Manual.....	1
Table 3-1 9-way D Connector Connections.....	6
Table 3-2 iWAND Power Modes	7

Amendment History

The amendment history records all amendments and additions made to this manual.

Issue	Revision	Date	Comments	Section	Page
A	0	07/03/2013	Initial Issue	All	All
B	0	21/06/2013	ECN12223 Inclusion of Firmware Upgrade instructions.	8	54
B	1	27/05/2014	ECN12598: ABOP Mode added. Lodestar Configuration added. Windows 8 Driver Installation added. Updated Section 1 Formatting and minor text updates.	4.5.7 5.5.5 App C 1 All	27-29 38-41 75-77 1 All
B	2	12/02/2016	ECN13257: Release mechanism section updated. Predeploy check description added. General update including images. Safety Section updated.	5.5.7 5.5.10 2	44 All All

Section 1 – Introduction

1.1 Scope of this Manual

This User Manual describes the safe installation, operation and maintenance of the 8315 iWAND. The information and procedures within this manual are based on Sonardyne's experience and knowledge.

To make sure the safety of the installer and operator is maintained it is important that all Warnings, Cautions and Safety Section in this manual, and the Warnings, Cautions and Safety Section of any additional manuals are read and understood.

1.2 Purpose of this Manual

This user manual contains information for personnel involved in installing, operating and maintaining the iWAND.

1.3 Related Publications

To make sure the equipment is operated safely, a *Sonardyne Safety Manual* is supplied with this user manual. It is important that the *Sonardyne Safety Manual* is read and fully understood before proceeding with any activity on the equipment.

Table 1–1 Related Publications

Publication	Title
<i>Sonardyne Safety Manual</i>	<i>Operational and Safety Precautions</i>
UM-8300-099	<i>User Manual for 6G Terminal Lite</i> (included on the 6G Utilities Disc)

1.4 Conventions

Table 1–2 Conventions used in this Manual

Format	Convention
Boldface Type	User Input, Menu Options, Keys, e.g. Click OK
Arrow (>)	Selection of an additional menu item e.g. File>Save
<i>Italic Type</i>	References to Figures, Tables, Sections and internal/external source

Section 2 – Safety

2.1 Introduction

The 8315 iWAND contains no user serviceable parts. Under no circumstances should the plastic housing be opened. If any repairs are required the unit must be returned to Sonardyne.

Before any activity is carried out on the equipment, it is recommended that the included *Sonardyne Safety Manual* and all warnings and cautions in this manual are read and fully understood.

It is recommended the operator complies with the Health and Safety Regulations applicable to the vessel and the region before operating this equipment.

Operators and service personnel must be familiar with the normal operating and safety procedures for subsea equipment.

Documentation must be consulted whenever a  or  warning symbol is found on the equipment, in order to determine the nature of the potential hazard and any actions which must be taken.

If any additional equipment is used, any warnings and cautions in the equipment user manual must be read and fully understood and the equipment must only be used as specified by the manufacturer.

The safety of any system incorporating this equipment is the responsibility of the assembler of the system.

2.2 Safety Procedures

Before carrying out any procedure on the equipment, make sure that all of the following warnings and cautions are read and fully understood.

2.2.1 Warnings



Personal protection. Appropriate protective equipment such as protective footwear, hard hat and gloves must be worn when handling or carrying out any procedures involving Sonardyne and other equipment.



Heavy equipment. Many Sonardyne products and equipment types, such as transponders, transceivers, cable drums etc. require Manual Handling Equipment (MHE) for lifting due to their heavy weight. If MHE is not available, it is the responsibility of the operator to perform a manual handling risk assessment prior to carrying out manual lifting/handling. Refer to the individual equipment documentation for weight specifications.

2.2.2 Cautions



Risk of equipment damage. All instruments must be maintained according to their individual operating manuals. Failure to follow recommended procedures could result in instrument failure, and loss of system integrity.



Risk of Corrosion. When the iWAND is not in-use make sure the tethered transducer is plugged in to reduce the risk of corrosion forming on the BNC connector.



Equipment Inoperable. Incorrect Firmware will render the iWAND inoperable. When updating the firmware, make sure the correct firmware file is selected.

Section 3 – Technical Description

3.1 Introduction

The Type 8315 iWAND (iWAND) is a handheld multiband test unit for acoustic testing and configuration of Sonardyne 6G equipment. The iWAND utilizes Sonardyne 6G Discovery to identify the unit under test (UUT) with a simple one-touch operation without knowledge of the acoustic address or frequency band. The rugged design coupled with simple interface and local colour display makes the iWAND ideal for back-deck operations.

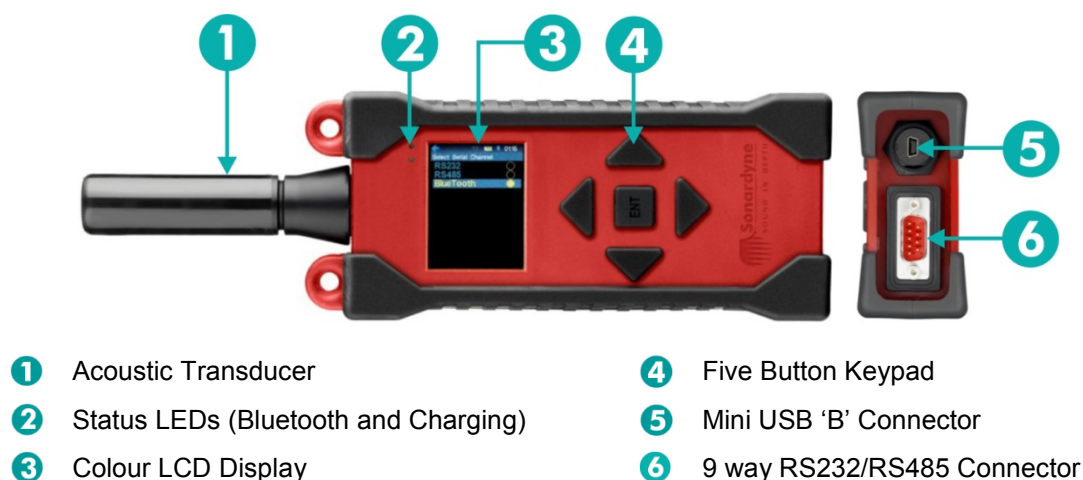
Using the companion iWAND 6G Configurator software, the iWAND simplifies configuration without the need for special knowledge of the Sonardyne 6G configuration language. When configured the 6G Configurator can generate a formatted report reflecting all settings configured on a unit prior to deployment. A database is held by the software so a history of all units configured can be maintained for later review.

The iWAND supports all 6G acoustic frequency bands (LMF, MF and HMF) and address ranges (Wideband® V1, Wideband® V2 and Wideband® V2 plus).

3.2 Hardware Description

The iWAND contains a low-power transceiver that communicates in the 6G command language. The rugged enclosure is rated to IP65 and can be operated over the temperature range [-10..+55]°C making it functional in most environments.

Figure 3-1 8315 iWAND



3.2.1 Battery and Charging

The iWAND contains an integrated lithium polymer battery. Charging is performed either when the unit is plugged into a computer via USB interface or via the supplied USB mains power adapter. The charge indicator LED on the front of the case above the screen indicates the 3 states of charging:

- OFF – no USB power has been detected
- Orange – the battery is being charged
- Green – the battery charge has completed

3.2.2 Communications

The iWAND can communicate serially via either RS232, half-duplex RS485, Bluetooth or USB. The iWAND 6G Configurator software will automatically identify the iWAND and establish a link to it. In addition to PC communication, the 9-way 'D' connector can be used with a standard Compatt data cable for serial testing. The RS232 connections on the connector are configured as data terminal equipment (DTE) so a cross-over cable is required to connect to a computer via this interface.

3.2.3 User Interface

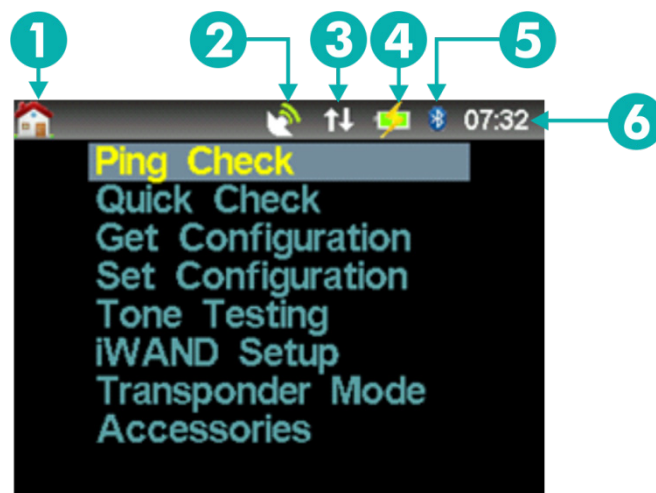
The iWAND user interface comprises 3 units:

- a 320x240 pixel sunlight readable LCD display
- a five key push-button keypad and
- a 3-axis accelerometer for orientation detection.

LCD Display

The LCD display provides local feedback of test results and progress of configuration related operations. It also provides configuration of the iWAND settings. All user interface screens have a common title bar at the top of the screen to display persistent information.

Figure 3-2 Example LCD Display Screen



- | | |
|--------------------------------|---|
| 1 Menu Navigation | 4 Internal Battery Level and Charging State |
| 2 GPS Status | 5 Serial Communication Method |
| 3 Serial Communications Status | 6 UTC Time |

For any menus or table displays that are too long to fit on the screen a direction indicator icon is displayed. The **UP** and **DOWN** arrow keys can be used to scroll the display.

Figure 3-3 Scrolling Displays



Keypad

The five button keypad enables menu navigation and option selection on the iWAND User Interface. Options are selected with the four outer buttons and the central **ENT** key is pressed to make the selection.

Figure 3-4 Keypad



Power to the unit can be controlled by the **ENT** button. Pressing the **ENT** button for more than 1 second and less than 5 seconds will put the iWAND into **IDLE** mode (refer to *Section 3.2.9 "Power Modes"*).

When entering **IDLE** mode via this method the 'shake to wake' function is disabled. Pressing the **ENT** for more than 5 seconds will put the iWAND into SLEEP mode.

NOTE

 In the event the iWAND becomes unresponsive, pressing the **UP** and **DOWN** keys together for more than 3 seconds resets the unit.

Accelerometer

The accelerometer performs two functions:

- Wakes up the unit from sleep when shaken 'shake to wake'
- Rotates the screen dependent on the orientation of the unit to make reading easier

When the **Shake to Wake** mode is disabled a press on any key on the keypad is required to wake the unit.

The screen rotation control allows the screen to rotate when the iWAND orientation is changed. The internal accelerometers are used to detect the orientation of the unit and rotate the screen accordingly to make the display easier to read.

3.2.4 Transducer Connector

Note

 When the iWAND is not in-use make sure the tethered transducer is plugged in to reduce the risk of corrosion forming on the BNC connector.

The BNC connector in the top of the enclosure is for attachment of the tethered iWAND transducer or an external hydrophone. Care should be taken when an external hydrophone is used as the splash-proofing of the housing will be compromised.

3.2.5 USB Connector

A standard Mini-USB Type 'B' connector is mounted at the bottom of the housing. This is for data communications with a host PC and for charging the unit. The iWAND complies with the USB 2.0 specification. While the unit will charge from a PC USB port, due to the charging requirements of the iWAND (especially when connected via unpowered hubs) it is recommended to use the supplied external mains USB adapter for charging.

3.2.6 9-way 'D' connector

The 9-way 'D' connector carries the following signals:

- RS232
- RS485
- Trigger In / Out

Table 3-1 9-way D Connector Connections

Pin #	Signal	Description
1	N/C	
2	RS232RX / RS485B	Receive line into iWAND in RS232 mode Data B line (Data -) in RS485 mode
3	RS232TX / RS485A	Transmit line out from iWAND in RS232 mode Data A line (Data +) in RS485 mode
4	N/C	
5	GND	Signal GND
6	N/C	
7	RS232 RTS	Request to send out from iWAND
8	RS232 CTS	Clear to send into iWAND
9	Trigger	Software configurable {IN / GPS PPS OUT}

3.2.7 Endcap Connector Cover

The rubber bung tethered to the endcap must be fitted whenever the connectors are not in use. Any internal connector covers should also be fitted. It is **critical** the connectors are protected as much as possible for both direct splash and moist air.

3.2.8 GPS

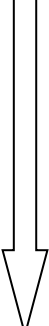
A GPS receiver is built into the iWAND for time synchronization and position recording. The primary functions of the GPS are:

- Synchronize the iWAND real-time clock with UTC time
- Provide location information when the iWAND is used to either set or get a configuration from a 6G instrument
- Keep time after the iWAND has powered down
- Provide a 1 PPS trigger out for external unit synchronization

3.2.9 Power Modes

As the iWAND has a limited capacity battery pack, to maximize battery life a number of power management features have been included in its design. These are outlined below.

Table 3-2 iWAND Power Modes

Mode	Description	To wake up	Increasing Battery Life 
Normal	Active mode – all systems on	N/A	
Idle	Screen switched off – all other systems active. Fully functional as transceiver	'Shake to wake' or keypad button press	
Sleep	Keypad powered for keypress wakeup and GPS real-time clock maintained. No longer functional as a transceiver.	Keypad button press	
Deep Sleep	All systems switched off.	Connect USB power	

The battery life for each mode above is shown in *Section 11.3 "Battery"*.

3.2.9.1 Normal Mode

In this mode the screen and all systems are powered, this will result in maximum battery drain. To increase battery life it is advisable to keep the screen-on time to a minimum.

3.2.9.2 Idle Mode

In this mode the screen is turned off to reduce power consumption. If used as a transceiver the unit will continue to function normally in this state. The unit can be returned to the normal mode by pressing any button on the keypad; if inertial wakeup is enabled shaking the unit will have the same effect. The time the iWAND stays in Normal Mode before entering Idle Mode is user configurable from between 1 and 30 minutes. The shorter the screen-on time, the longer the battery will last.

Each time a button is pressed while the screen is on or the orientation of the unit is changed, the screen-on timer is reset so the screen will stay on for the configured time after this event. The iWAND can be manually put into Idle Mode by holding the **ENT** button down for more than 1 second (but less than 5 seconds or the unit will enter Sleep Mode).

3.2.9.3 Sleep Mode

In this mode the main processor is switched off so the unit can no longer respond to serial commands or communicate acoustically. The only systems that are maintained in this state are the keypad, so a button press can wake the unit and the real-time clock in the GPS unit so the processor has an approximate time on power-up. An accurate time will be acquired as soon as the unit has a view of the sky to get an updated GPS fix.

The iWAND can be manually put into Sleep Mode by holding down the **ENT** button for more than 5 seconds.

3.2.9.4 Deep Sleep

This mode is the lowest power mode for the iWAND. In this state all systems are powered off so the GPS will lose its time and the keypad wakeup will not function. The only way to start-up from this state is by plugging in USB power.

This mode should be used when shipping the unit – it electronically disconnects the battery and the disabling of the keypad means that it won't accidentally be turned on and arrive with a flat battery. When leaving this mode the battery level indicator will not be valid until the unit has fully charged.

When leaving the unit on the shelf for extended periods it is advisable to put it in this mode.

Section 4 – Connection and Setup

4.1 Introduction

The iWAND is supplied in a transit case containing all accessories including charging equipment (with international plug adapters) and Bluetooth dongle.

Note



Before operating the iWAND it must first be fully charged and the UTC time must be set.

4.2 Charging the iWAND

To charge the iWAND, connect the wall plug charger to the mini USB connection point on the bottom of the iWAND and using one of the international plug adapters connect to a mains power supply.

Figure 4-1 Mini USB Connection Point for Charging



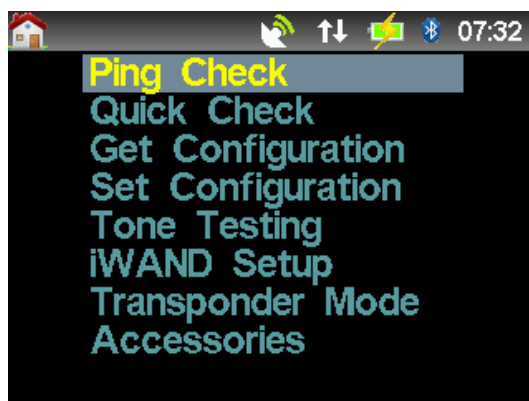
1 Mini USB 'B' Connector

The iWAND will be fully charged when the green LED light is illuminated. With the iWAND attached to the charger, switch the iWAND **ON** to configure the charge percentage value.

4.3 Setting the iWAND Time

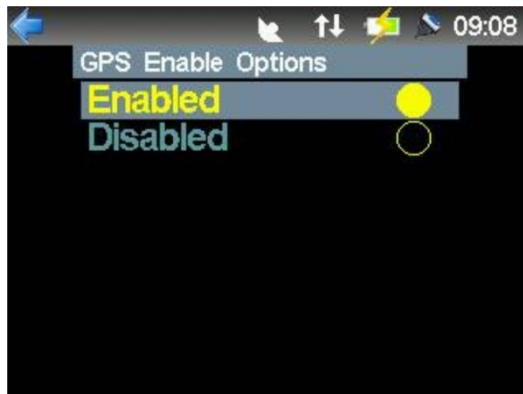
On receipt of the iWAND, the UTC time on the unit will need to be set. To set the time the GPS must be enabled and receiving a signal. A satellite symbol with signal bars will be displayed on toolbar when the GPS is enabled and receiving a signal.

Figure 4-2 GPS Enabled and Receiving a Signal



If the GPS symbol is not present it can be enabled by scrolling to the **iWAND Setup > Power Saving > GPS Enable**.

Figure 4-3 GPS Enabled / Disabled



Make sure the iWAND has a clear view of the sky. The satellite symbol will flash to indicate the internal clock is being set. Wait for the symbol to stop flashing and the UTC time is displayed.

Note



The time shown is UTC time and not local time.

4.4 Connecting to the iWAND

There are several ways to connect the iWAND:

- Wirelessly via Bluetooth (Windows® 7 or later recommended)
- USB
- Serially via RS232 or half duplex RS485

Any of these methods can be used to communicate with the iWAND 6G Configurator software, or if the iWAND is being used as a transceiver. All the connection methods will present themselves to the computer as a standard COM port so can be used with any terminal program (HyperTerminal, ProComm etc.).

The RS232/RS485 interface can also be used to connect directly to an instrument for serial interface testing using the iWAND Serial Terminal on the Accessories menu.

4.4.1 Bluetooth

It is highly recommended the Bluetooth dongle supplied with the iWAND is used to make connection. If a computer is being used with integrated Bluetooth it is recommended the internal Bluetooth is disabled and the supplied Bluetooth dongle is used. If this is not possible the computer Bluetooth interface must be capable of supporting the Bluetooth 2.1+EDR standard or later.

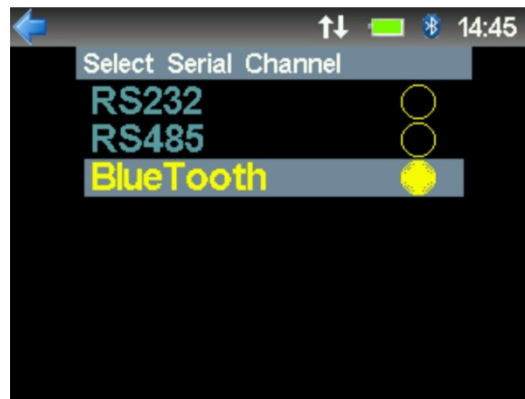
The iWAND Bluetooth interface supports the Bluetooth Serial Port Profile (SPP) so once installed it will appear as a standard COM port. The Bluetooth radio signal range is dependent on the environment but should normally operate up to 10 meters from the computer.

Note

It is recommended to use the Bluetooth dongle shipped with the iWAND.

To use the Bluetooth interface on the iWAND it must be enabled: **iWAND Setup > Communications**. If Bluetooth is already enabled it is indicated by the presence of the Bluetooth logo icon on status bar next to the battery level indicator.

Figure 4-4 Enabling Bluetooth



When Bluetooth has been selected by pressing the **ENT** button the Bluetooth icon should appear on the status bar. As soon as the Bluetooth interface is enabled the iWAND should be discoverable by another Bluetooth device.

4.4.1.1 Installing the Bluetooth Dongle Application

The supplied USB Bluetooth dongle includes a driver CDROM.

Note

For Windows 8 installations; if an error occurs regarding installation of an unsigned driver (digital signature), refer to *Appendix B*.

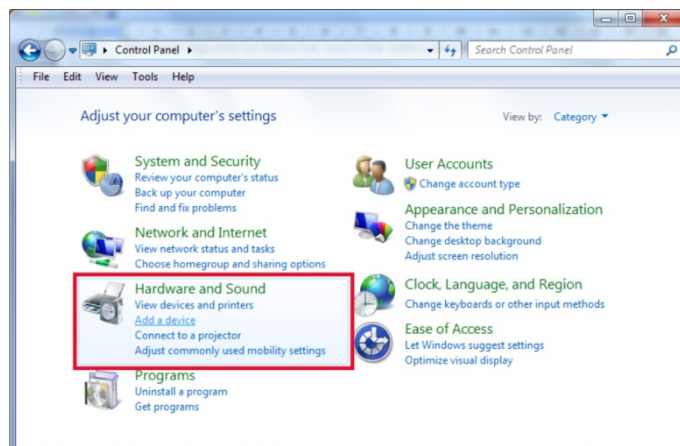
1. Insert the CDROM and click *View Installation Guide* to view the manufacturer's installation procedure.
2. Browse to the CDROM drive in Windows Explorer and run the Bluetooth application by double-clicking the manufacturer's setup file.
3. Follow the instructions found in the installation guide to install the application.

4.4.1.2 Adding the iWAND to the Computer via Bluetooth

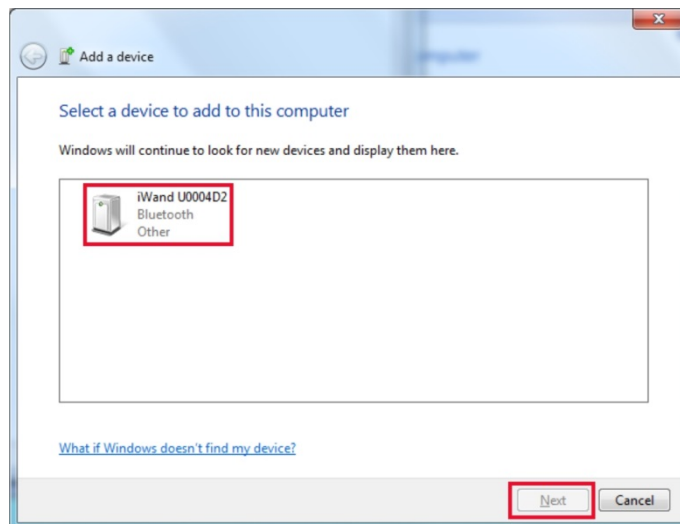
Windows 7

With Bluetooth on the iWAND enabled as described in *Section 4.4.1* and the Bluetooth dongle installed as in *Section 4.4.1.1* the iWAND is ready to install.

1. Open the Control Panel as shown below (view by Category) and on the **Hardware and Sound** section click **Add a device**.



2. Select the iWAND and then click **Next** to complete the installation.

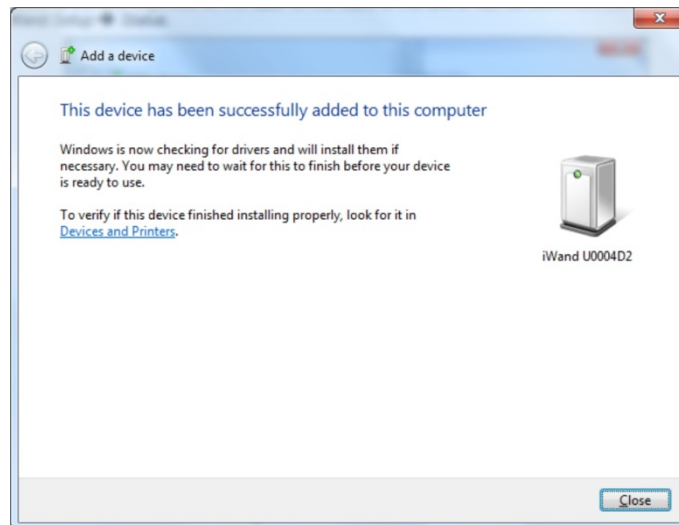


Note

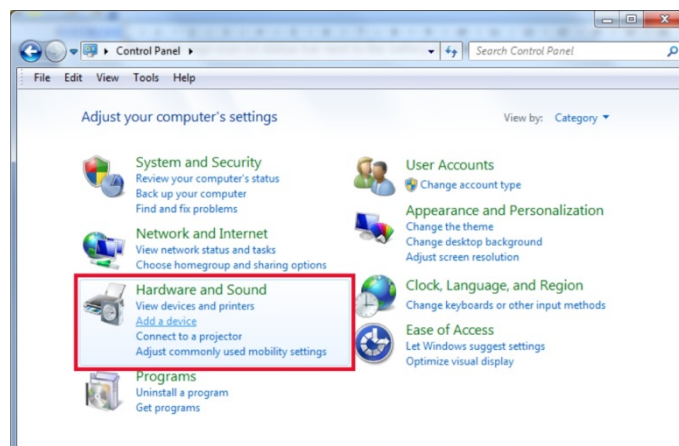
Any Bluetooth enabled phones or other local devices are likely to be detected – the iWAND is identified by its name 'iWAND UXXXXXX' where XXXXXX are the 6 hex digits of the UID.

3. If multiple iWANDs are detected the UID is printed on the label on the back of the unit or can be seen on the menu item **iWAND Setup > iWAND Information**.

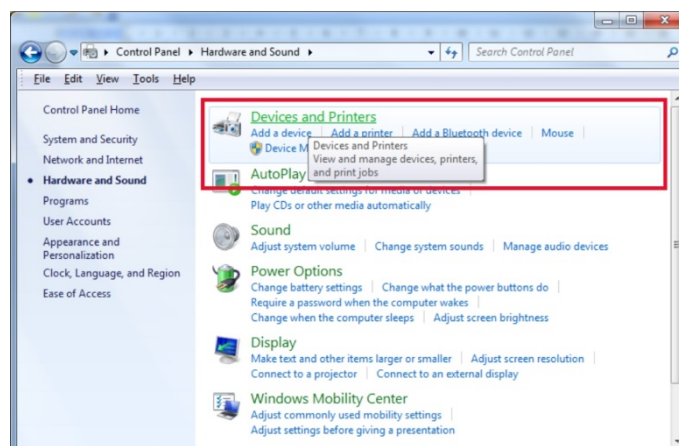
4. Once the iWAND has been successfully connected the **Add a device** window can be closed



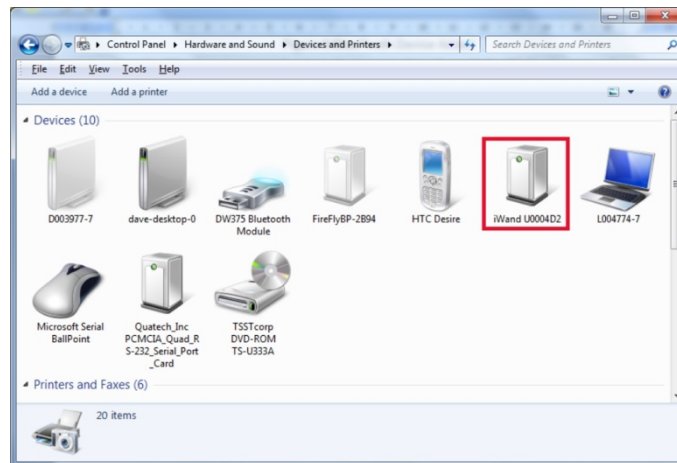
5. Now the iWAND has been installed it can be connected to the iWAND 6G Configurator software using any serial terminal program for use as a transceiver.
6. To identify the COM port Windows has assigned to the iWAND, return to the **Control Panel**.
7. Click on the **Hardware and Sound** link.



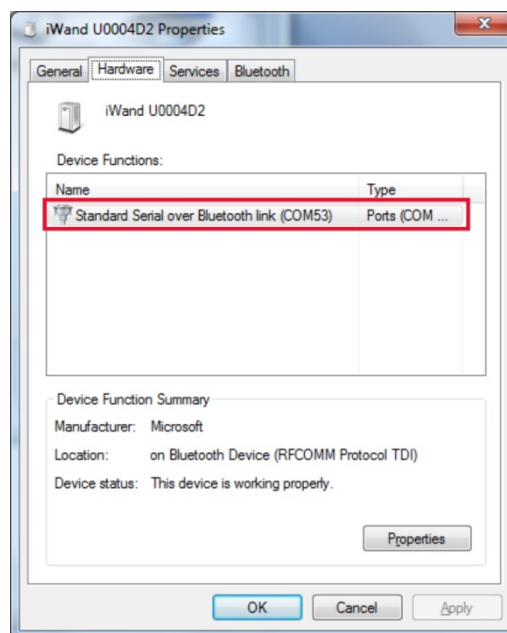
8. Click on the **Devices and Printers** link.



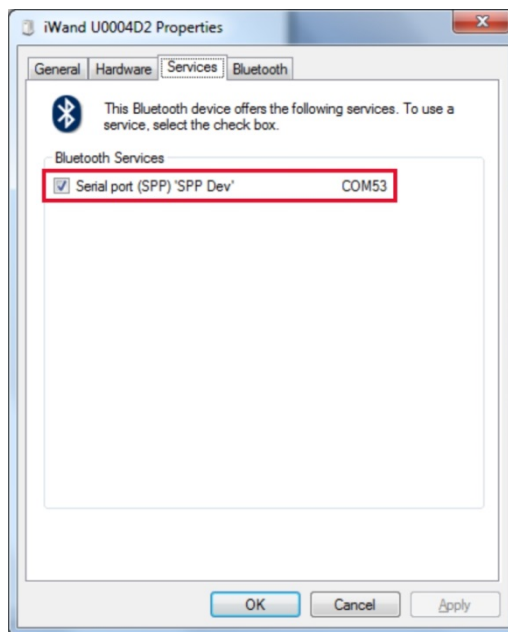
9. Select the **iWAND** on the **Devices and Printers** window.



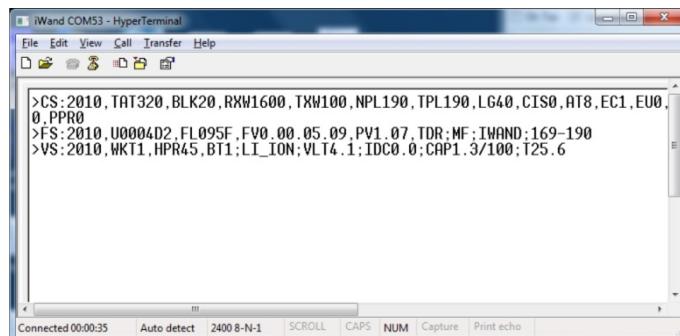
10. Right-click on the iWAND and select **Properties**.
11. The COM port assigned to the iWAND will be shown on the **Hardware** tab.



12. If no COM port is assigned make sure the **Serial Port (SPP)** option is selected on the **Services** tab.



13. Once the assigned COM port is known the iWAND can be communicated with using a terminal program such as HyperTerminal. A baud rate setting is not relevant so does not require configuring.



Windows XP

Windows XP is not currently supported for Bluetooth connection.

4.4.2 USB

When installed, the USB interface on the iWAND will appear as a virtual COM port. The driver is supplied on the Sonardyne CDROM (920-2004) in the \Drivers directory.

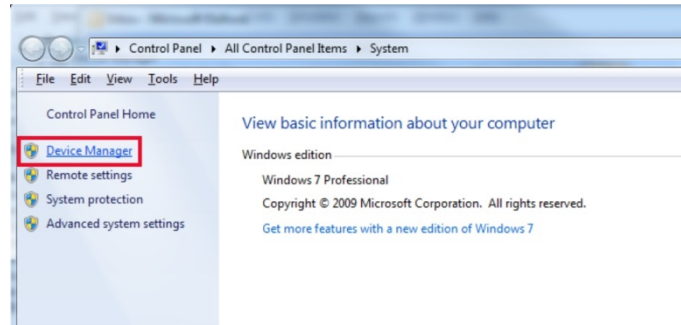
4.4.2.1 Adding the iWAND to the Computer via USB

The following steps show the installation sequence for Windows 7. The sequence will be similar for Windows XP and Windows 8.

Note

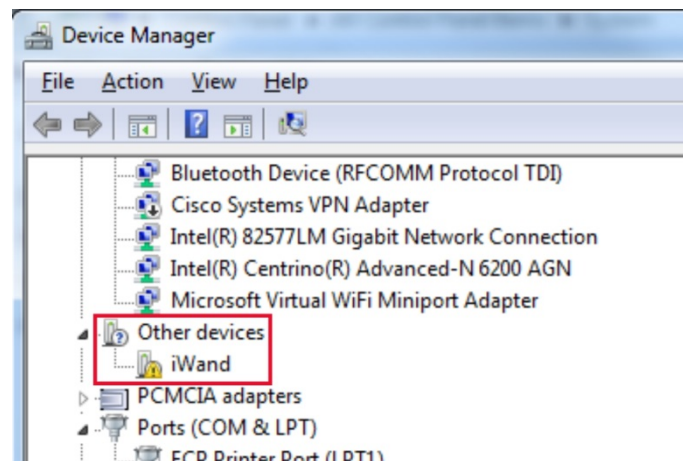
 For Windows 8 installations; if an error occurs regarding installation of an unsigned driver (digital signature), refer to Appendix B.

1. On plugging the iWAND USB cable into the computer, Windows will attempt to load the driver and fail.
2. On the Windows Start menu, right-click on **Computer**, select **Properties** and then **Device Manager**.

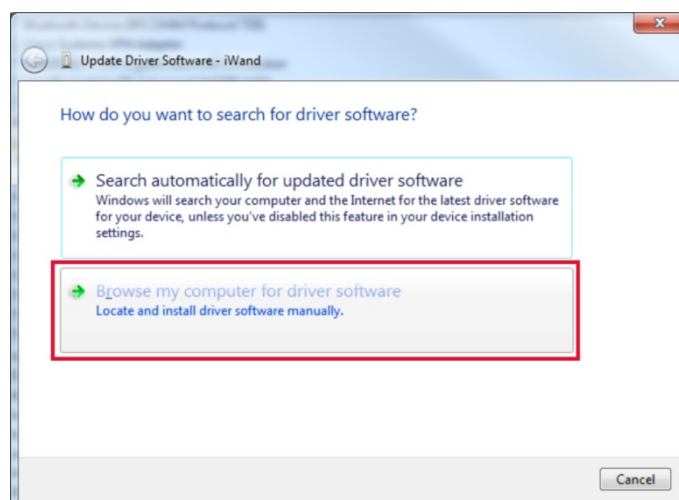


3. In **Device Manager**, on the **Other devices** drop-down list select the iWAND.

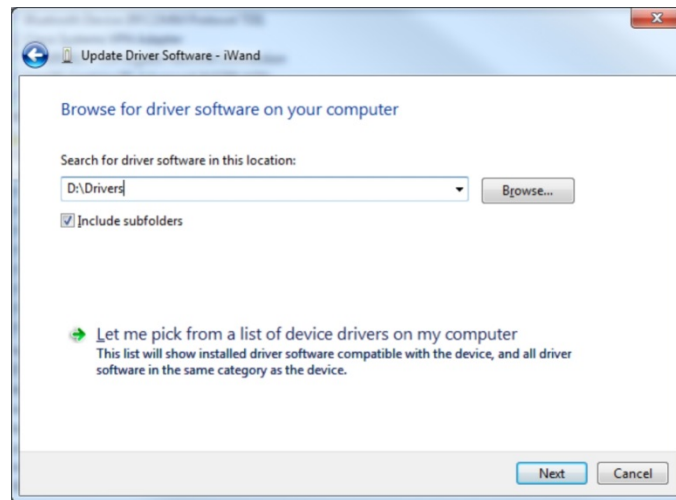
Figure 4-5 iWAND Driver Installation



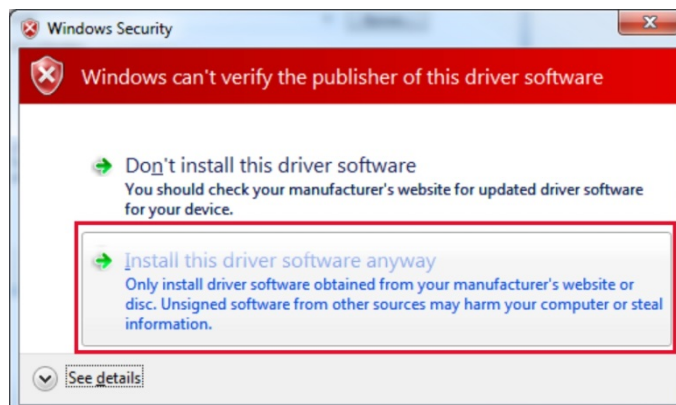
4. Right-click on the iWAND device and select **Update Driver Software....**
5. Select the **Browse my computer for driver software**.



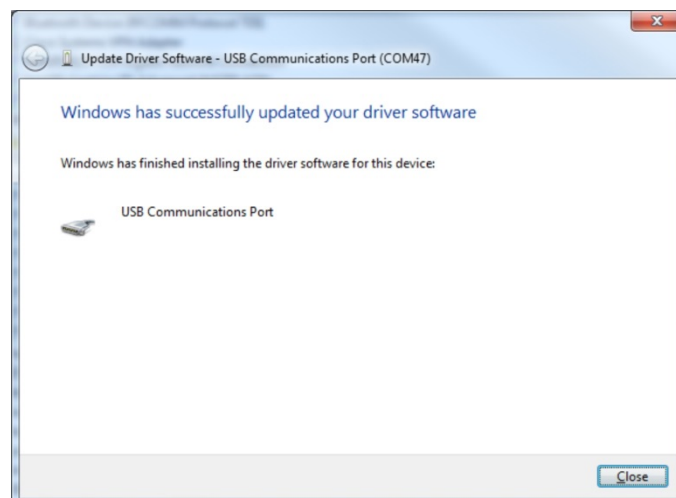
- Click the **Browse** and locate the **Drivers** directory on the supplied Sonardyne CDROM 920-2004.



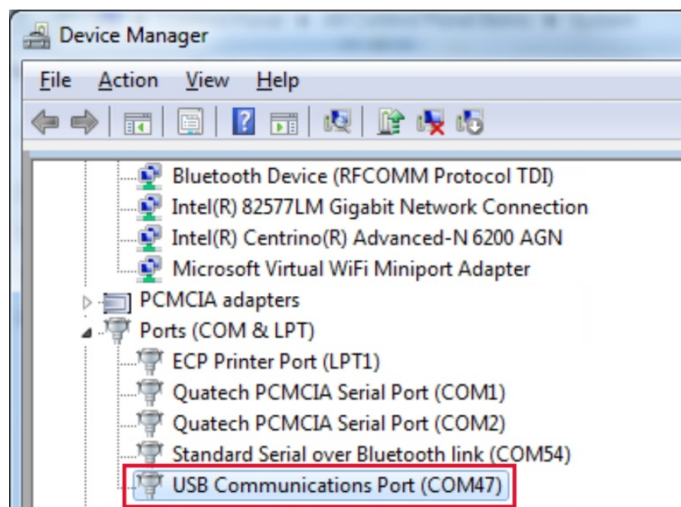
- Windows will locate the correct drivers and prompt for confirmation. Click **Install this driver software anyway**.



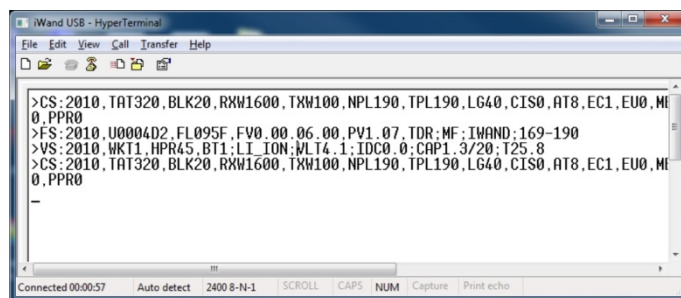
- On successful completion of the driver installation an **Update Driver Software** window will appear.



9. Once installed the iWAND will appear as a new COM port on the computer. The COM port number can always be identified in the **Device Manager**.



10. The iWAND should be able to communicate with most terminal programs (e.g. HyperTerminal).



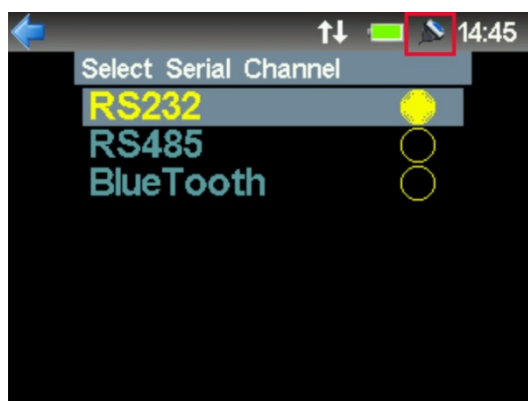
Note

When connected, the serial settings (baud rate, stop bits etc.) are not important so the default settings can be used.

4.4.3 RS232/RS485 Connection

To communicate with the iWAND via an RS232 or RS485 connection, make sure the correct setting is selected on the **Select Serial Channel** menu (**iWAND Setup > Communications**).

When either RS232 or RS485 is selected a small serial connector icon will appear on the user interface next to the time.



4.4.3.1 Baud Rate Settings

The default baud rate setting is 9600, however this setting may have been modified by the PORT command.

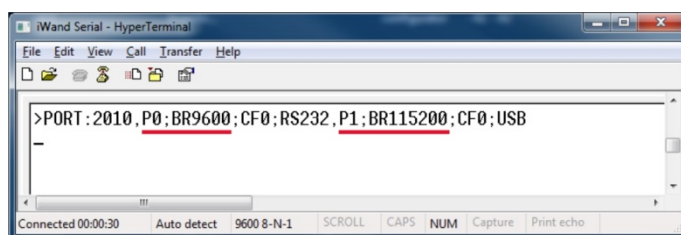
The baud rate can be identified by setting the terminal program (e.g. HyperTerminal) to 9600 baud and issuing a <**BREAK**> to the iWAND. The <**BREAK**> will reset the unit and on a restart it will output its current PORT settings at 9600 before switching to the configured baud rate.

In HyperTerminal a <**BREAK**> can be sent by holding **CTRL** and pressing the **Break** key.



The baud rate configured for P0 (port 0) is set at the default 9600 baud **BR9600**. P1 (port 1) is assigned to the USB interface; this is always available regardless of the settings assigned to port 0.

Figure 4-6 iWAND Serial Output After a <**BREAK**>

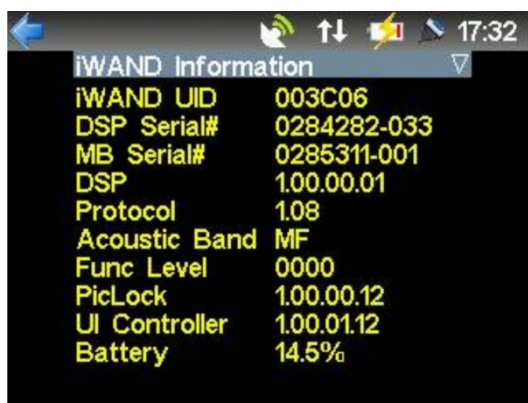


4.5 iWAND Setup

4.5.1 iWAND Information

The iWAND information screen shows the status of the iWAND and includes firmware version information.

Figure 4-7 iWAND Information



4.5.2 Time Information

The time information screen shows the time source used by the iWAND. In the best case the unit will be in view of satellites and updating – this will be indicated by a time source of **GPS 1PPS** and the **Last Synchronized** time will match the current time. If the unit has been powered on without a view of the sky it will take its time from the GPS internal RTC. If the GPS has not seen the sky since power was last removed it will not be set – it must be set with the iWAND 6G Configurator software or taken out to get a clear view of the sky.

Figure 4-8 Time Information View



4.5.3 Communications

Clicking on Communications allows selection of the communications channel to serial communicate with the iWAND. When either RS232 or RS485 are selected the baud rate will default to 9600. Regardless of this setting the USB interface is always available to use. For information on setting the baud rate see *Section 4.4.3.1 “Baud Rate Settings”*.

Configuration of the serial communication mode is performed via the iWAND user interface:

iWAND Setup > Communications

The Bluetooth connection LED will light solid blue when a connection has been established.

4.5.4 User Interface

4.5.4.1 Screen Rotation

The screen rotation screen allows control of how the screen will rotate when the iWAND orientation is changed. Once the orientation has changed (if rotation is enabled) the unit must return to the horizontal plane before being rotated to the new orientation. The '90 Degree' option allows rotation in 90 degree steps; the '180 Degree' option restricts rotation to 'normal' and 'upside down'; 'Disabled' prevents the screen from rotating.

The screen rotation options can be selected from **iWAND Setup > User Interface > Screen Rotation** where it can be disabled or restricted to 90 or 180 degree steps.

4.5.4.2 Inertial Wakeup

Allows the operation of the inertial **Shake to Wake** feature to be enabled or disabled. Once the screen has turned off and the iWAND has entered Idle Mode (see *Section 3.2.9* for description of power modes) if inertial wakeup is enabled shaking the unit will return it to Normal Mode and the screen will be turned on.

To configure the inertial wakeup: **iWAND Setup > User Interface > Inertial Wakeup**.

4.5.4.3 Colour Scheme

The iWAND display colour scheme can be changed. To improve visibility in certain lighting conditions it may be beneficial to switch to a high-contrast colour mode. The **Standard** scheme is recommended for most situations.

Figure 4-9 Colour Scheme – Standard



Figure 4-10 Colour Scheme – Green

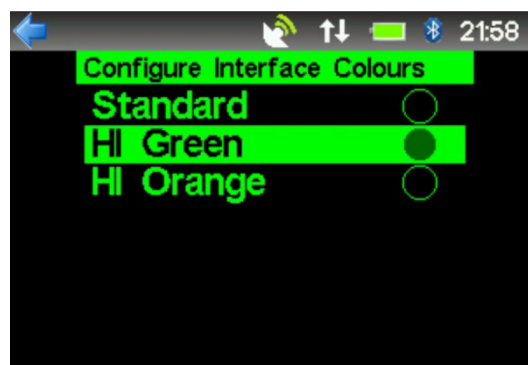
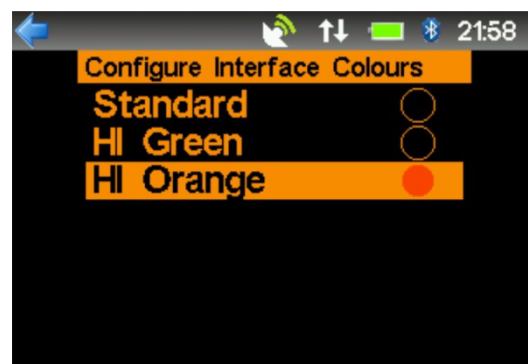


Figure 4-11 Colour Scheme – Orange



4.5.4.4 Screen Brightness

This allows control of the display backlight brightness. It is recommended to leave it at 'Maximum' – however, reducing the brightness will extend battery life.

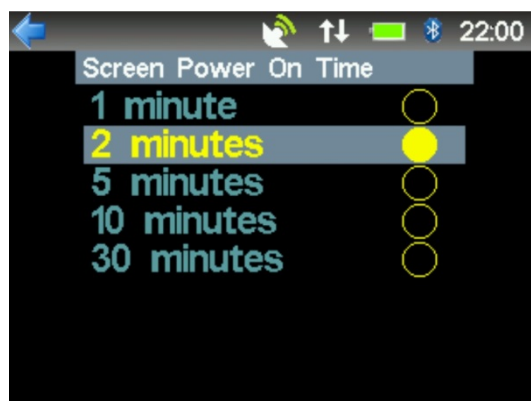
4.5.5 Power Saving

4.5.5.1 Screen-On Time

The **Screen-on Time** control determines how long the iWAND will spend in Normal Mode before switching the display off and entering Idle Mode. The shorter the duration the longer the battery will last for.

To configure the screen-on time: **iWAND Setup > Power Saving >Power On Time**

Figure 4-12 Screen Power On Time Options



4.5.5.2 GPS Enable

This allows the internal GPS to be turned on or off to extend battery life if required.

Note

 When the GPS is disabled the iWAND time will no longer be able to synchronize to GPS time.

To configure the GPS Enable: **iWAND Setup > Power Saving >GPS Enable**

Figure 4-13 GPS Enable / Disable



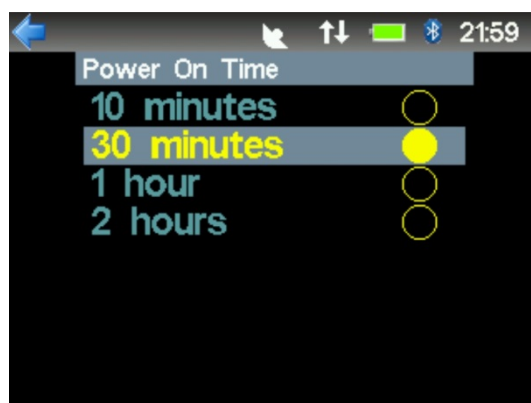
4.5.5.3 Turn-On Time

The length of time the iWAND spends on before entering the Sleep Mode is configured from this menu.

To configure the Turn-on Time: **iWAND Setup > Power Saving > Power On Time**; the shorter this period the longer the battery life.

The turn-on time timer is reset whenever a button is pressed or a serial command is received. The shorter the configured time the longer the battery life will be. If the iWAND is being powered by USB it will remain powered on indefinitely; once the external power is removed the power on time will start to count down.

Figure 4-14 Power On Time Before Entering Sleep Mode



4.5.5.4 Turn Off Now

This option will immediately put the iWAND into Sleep Mode – the same can be achieved by holding the **ENT** key down for more than 5 seconds (see *Section 3.2.9.3* for details).

To turn off the iWAND: **iWAND Setup > Power Saving > Turn Off Now**

4.5.5.5 Off For Shipping

This option will electronically disconnect the internal battery and prevent it from an accidental wakeup on a keypad press that maybe experienced during shipping. USB power must be provided to wake the iWAND from this state (see *Section 3.2.9.4*)

To turn off the iWAND for shipping: **iWAND Setup > Power Saving > Off for Shipping**

4.5.6 Discovery Options

4.5.6.1 Enable All Bands

As a factory default the 6G Discovery operation at the beginning of the 'Quick Check', 'Get Configuration' and 'Set Configuration' sequences will search for an instrument in any of the 6G acoustic frequency bands (LMF, MF and HMF). If any of these bands have been disabled (see *Section 4.5.6.2*), this option will re-enable them all.

To enable all bands: **iWAND Setup > Discovery Options > Enable All Bands**

4.5.6.2 LMF Band, MF Band, HMF Band

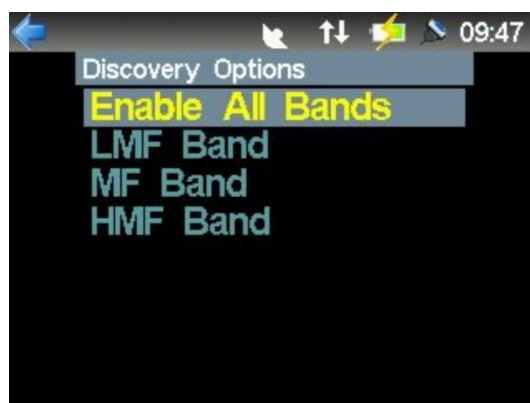
These options allow the individual frequency bands used in the 6G Discovery process at the beginning of the 'Quick Check', 'Get Configuration' and 'Set Configuration' sequences to be enabled or disabled. If the user only has certain types of unit (e.g. all LMF) it will speed up the 6G Discovery process by skipping over the disabled bands.

Note

 If in doubt Enable All Bands as described in *Section 4.5.6.1*.

To enable the different bands: **iWAND Setup > Discovery Options**

Figure 4-15 LMF, MF and HMF Bands



4.5.6.3 Acoustic Band

When being used as a transceiver or in transponder mode (see *Section 4.5.7*) the iWAND must be set to the same band as the unit being communicated with. This menu allows selection of the correct MF, LMF or HMF bands.

To configure the acoustic band: **iWAND Setup > Acoustic Band**

Figure 4-16 Acoustic Bands



4.5.6.4 Reset Options

Reset All Settings

This will reset all configurable options relating to the iWAND to their factory default values. The database of any instruments configured by the iWAND will not be affected.

To reset all settings: **iWAND Setup > Reset Options > Reset All Settings**

Clear Database

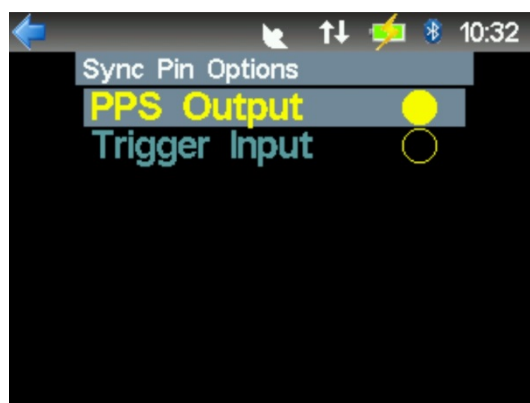
This option will wipe the internal storage of any instruments the iWAND has been used to configure. The database held by the 6G Configurator software will not be cleared by this operation.

To clear the database: **iWAND Setup > Reset Options > Clear Database**

4.5.6.5 Sync Pin Options

When PPS Output is selected, if the GPS receiver is enabled and the iWAND has a good view of the sky, the 1PPS output from the GPS receiver will be output on the 'Trigger' pin on the 9 way connector. When configured as Trigger Input the iWAND will trigger a BR cycle on every rising edge of the 'Trigger' pin.

Figure 4-17 Sync Pin Options



4.5.7 ABOP Mode

When communicating with Sonardyne 6G BOP devices, ABOP mode needs to be activated so the correct wakeup and 6G Discovery signals are used. To access the menu, click **iWAND Setup > ABOP Mode**. To enable ABOP mode, select the **Enable** option and press the **ENT** key. The word **ABOP** will appear in the title bar as shown in *Figure 4-18* until ABOP mode is disabled.

Note

 When the ABOP mode is enabled the wakeup and 6G Discovery signals used are **NOT THE SAME** as for standard Sonardyne 6G instruments. Therefore this option should **ONLY** be selected when operating with Sonardyne 6G BOP equipment.

Figure 4-18 ABOP Mode Selection

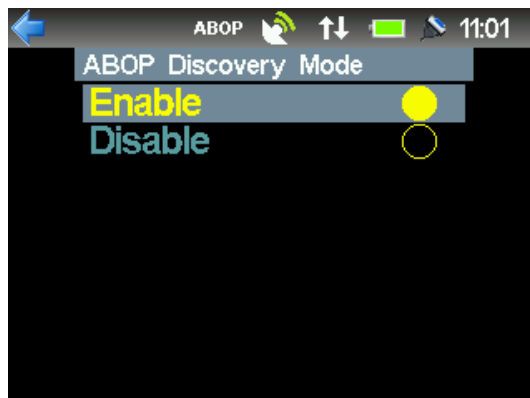
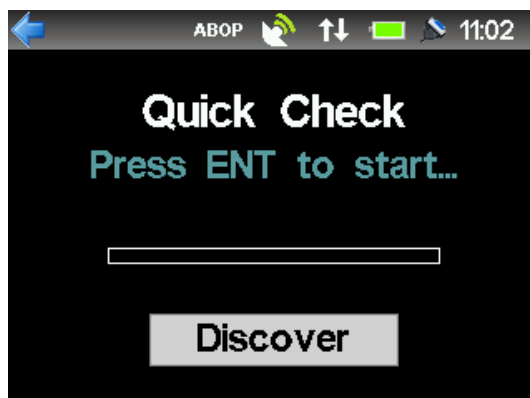


Figure 4-19 Quick Check with ABOP Mode enabled



4.5.8 Transponder Mode

Transponder Mode allows the iWAND to behave as a transponder. It can therefore be used to test an external Sonardyne 6G transceiver. The current acoustic settings of the iWAND are shown on the display. These values can be used in conjunction with the acoustic test mode in the 6G Configurator software or directly with direct 6G commands to the transceiver.

Figure 4-20 Transponder Mode



The Common Interrogate channel (CIS in *Figure 4-20*) will indicate the current assigned CIS channel or 'Disabled' if the CIS channel is not enabled.

Note

The transmit power for the iWAND is significantly lower than a standard Sonardyne Transponder. It will only operate at short range in a quiet environment for tank testing applications, or with direct transducer contact when used in air.

4.5.9 Accessories

The Accessories menu contains miscellaneous functions for non-acoustic testing.

4.5.9.1 Serial Terminal

The Serial Terminal function is provided to aide diagnostics of a 6G instrument when the acoustics are not functioning correctly. A standard Compatt serial cable can be plugged into the 9-way connector on the iWAND and connect directly to the 6G instrument.

Figure 4-21 Serial Terminal Startup View



On starting, the Serial Terminal will present a menu as shown in *Figure 4-21*. The menu title bar shows the baud rate the terminal is currently set to – this will be the default speed the iWAND serial port is configured to. If the baud rate of the instrument connected to does not match the baud rate shown, or the baud rate is not known selecting the **<BREAK>** option will issue a serial break to the instrument to reset it and configure the Serial Terminal baud rate to match the instrument.

Once the baud rate is configured correctly, any of the predefined 6G commands can be issued and their raw text responses will be displayed.

Figure 4-22 Serial Terminal Command Response View



4.5.9.2 GPS Accessories

The GPS Status view provides a simple diagnostic view of how well the iWAND GPS receiver is receiving satellite signals. The display shows elevation and azimuth with the received signal strength of each satellite being tracked. Orange or green satellites are good. When the Fixes field shows '3D Fixes' the GPS receiver has a good view of the sky.

Figure 4-23 GPS Status View



The Current Position view displays the current latitude and longitude along with the time the fix was made. If the GPS signal drops out the display will stop updating until the GPS signal is re-acquired.

Figure 4-24 Current Position View



Section 5 – Operation

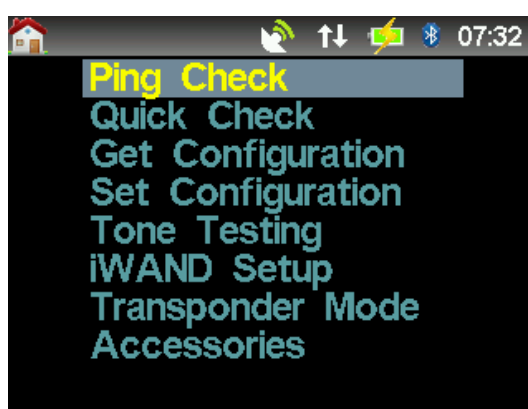
5.1 Introduction

This section describes the operation of the iWAND. All functions of the iWAND are available on the menu system. As a standalone instrument the iWAND can provide testing and status reporting of Sonardyne 6G instruments. When used in conjunction with the Sonardyne iWAND 6G Configurator software the iWAND can perform fully acoustic instrument configuration with a single button press.

5.2 Menu System

The home screen main system menu is shown in *Figure 5-1*.

Figure 5-1 Home Screen



The operation of the keypad keys is as follows:

- The UP and DOWN arrow keys change the selected menu item.
- The ENT key selects the highlighted menu item.
- The BACK arrow key returns to the previous menu until the home screen is reached.

5.3 Prerequisites for Operation

The first four menu options **Ping Check**, **Quick Check**, **Get Configuration** and **Set Configuration** all begin with a Sonardyne 6G Discovery operation to identify the instrument being communicated with.

Note

 As the WSM6 is a tone interrogation transponder it DOES NOT support 6G Discovery – acoustic testing of WSM6 is handled in the Tone Testing menu described in *Section 5.7*.

Once the instrument is identified, a series of commands are sent to get the status of the instrument. For this process to succeed the following conditions must be met:

- a. The firmware on the 6G Instrument must be at least the version number outlined in *Section 11.6*.
- b. The battery level on the instrument being interrogated **MUST** be greater than 5% capacity remaining. Below this level the 6G Instrument will only respond to a very limited command set. If the battery is too depleted the iWAND will display a **Battery Too Low** message and will not continue.
- c. The battery on the 6G instrument must be a genuine Sonardyne 6G battery pack. If this is not the case the 6G instrument will only respond to a very limited command set. The iWAND will display a **Battery Authentication Error** message and will not continue.
- d. There must be good acoustic coupling between the iWAND transducer and the transducer of the instrument being interrogated. The iWAND transducer should be firmly pressed against the transducer of the instrument being interrogated.

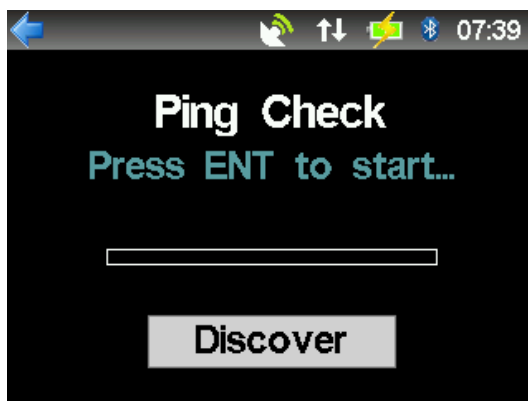
Figure 5-2 Positioning the iWAND Against the Instrument Transducer



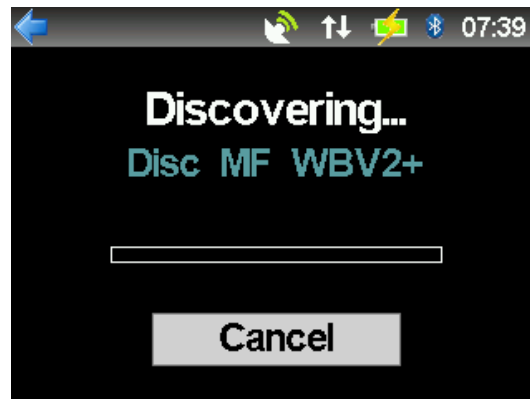
5.4 Ping Check

The **Ping Check** option will do the minimum communication to identify the instrument and display its basic status. Once discovered the instrument will be interrogated to get its status.

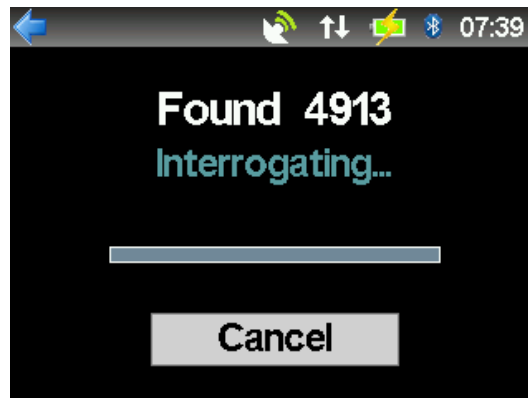
1. On the main menu select **Ping Check**.
2. To begin the sequence press **ENT**.



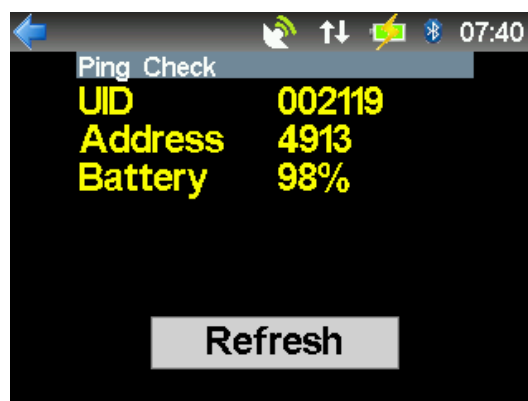
3. This will begin with a **Discovery** process.



4. Once the instrument has been discovered it will be interrogated.



5. Following a successful interrogation the basic status of the instrument will be displayed. Pressing **ENT** will repeat the operation. The **BACK** arrow key will return to the main menu.

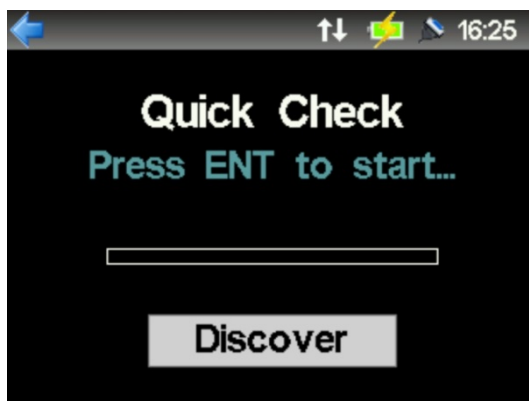


5.5 Quick Check

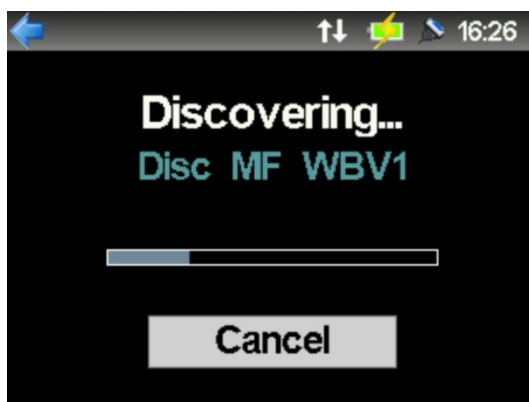
This menu leads to all of the standalone test options. It includes functions to view acoustic settings, battery status, sensor measurements and a number of other operations to view configuration and status of the instrument. It also provides operational testing of the mechanical release (if present) and acoustics of the instrument.

The details of all the options within the Quick Check menu are outlined below.

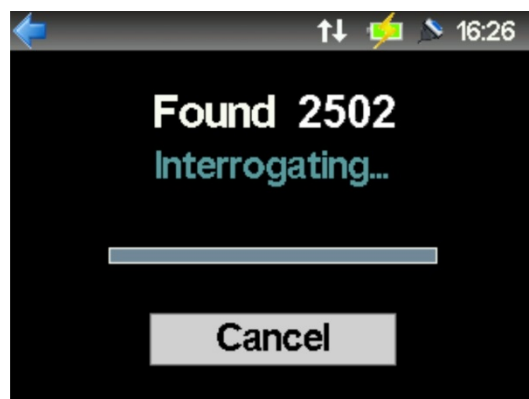
1. On the main menu select **Quick Check**.
2. To begin the sequence press **ENT**. This will begin with a **Discovery** process.



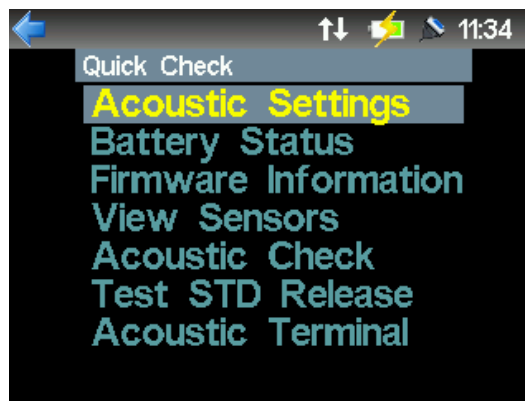
3. The Discovery process will search all enabled bands to find the instrument.



4. When the instrument is found the iWAND will start gathering information.



5. On completion of the Discovery process the **Quick Check** menu will appear. Depending on the configuration of the instrument, various options within the Quick Check menu (e.g. sensors, acoustic release, HPR check etc.) may not be displayed if they are not relevant.



5.5.1 Acoustic Settings

The Acoustic Settings screen shows the acoustic configuration of the instrument. The Instrument UID, Functionality level, Band and Transducer are fixed; the remaining parameters can be configured with the iWAND 6G Configurator software.

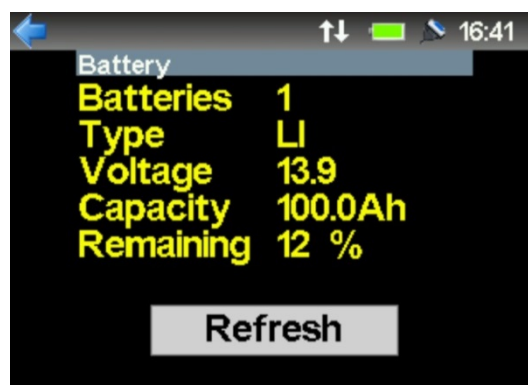
Figure 5-3 Acoustic Settings



5.5.2 Battery Status

The Battery Status screen displays information about the instrument battery. If the **Remaining %** field falls below the 5% threshold the instrument will stop functioning normally (unless the battery override flag is set) and will only respond to certain acoustic commands.

Figure 5-4 Battery Status



5.5.3 Firmware Information

The Firmware Information screen shows the firmware version of the software inside the instrument. This may be required when contacting Sonardyne customer support.

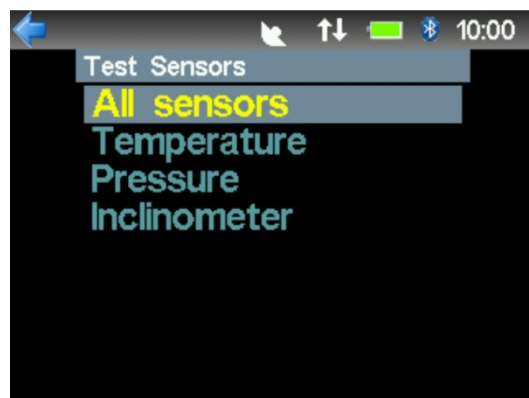
Figure 5-5 Firmware Information



5.5.4 View Sensors

The View Sensors screen lists all sensors available and fitted on the instrument.

Figure 5-6 Sensors



Selecting the **All Sensors** option shows the current measurement of each of the sensors available on the instrument.



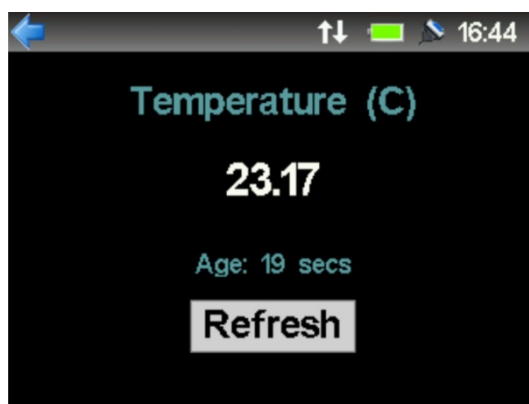
The colour of the sensor value indicates the error status of the measurement:

- GREEN – measurement is valid and less than 10 seconds old
- ORANGE – the measurement is > 10 seconds old
- RED – the measurement is reported in error (out of range)

Pressing the **Refresh** button will request another reading – some sensor types have a long warm up time, so several refresh operations may be required.

For more information (including error information and measurement age) each individual sensor can be selected and viewed (see the figure below). As various sensors have variable warm up times they can take several seconds to start up and begin giving good values.

Pressing the **ENT** key to perform a refresh will re-read the sensor.

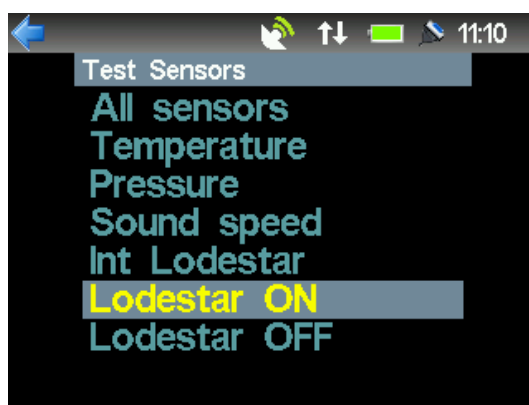


5.5.5 Lodestar Support

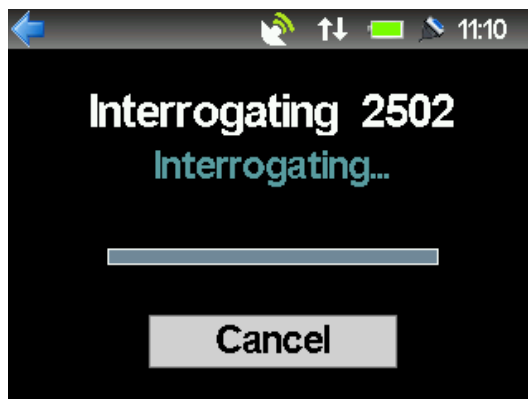
5.5.5.1 Power Control

If an internal Lodestar is detected, extra menu options will appear to allow it to be turned on or off.

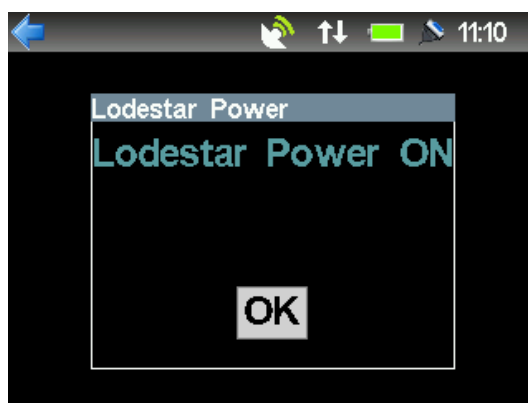
1. To Turn the Lodestar on select **Lodestar ON**.



2. The interrogation will start.



3. The Lodestar can be turned on by selecting **OK**.



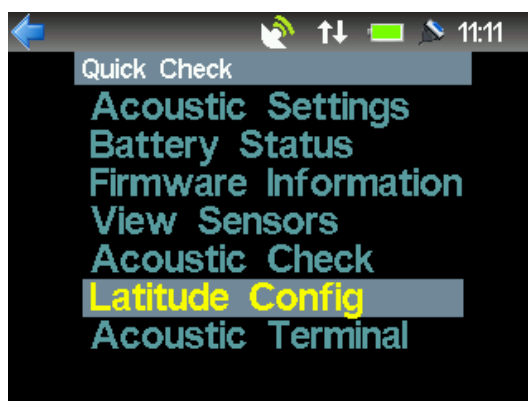
4. After turning the power on, the Lodestar will require a period of time to boot and a few minutes for the sensors to settle.

5.5.5.2 Latitude Configuration

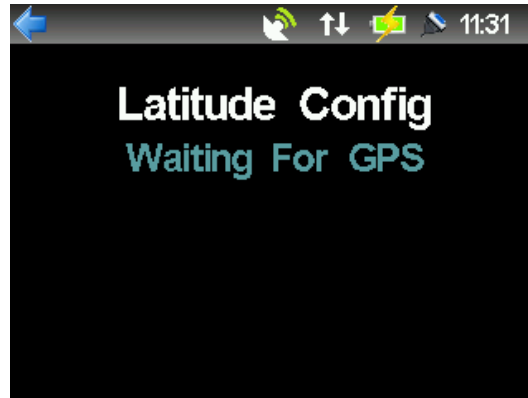
If a Lodestar is detected, **Latitude Config** appears on the **Quick Check** menu to configure the latitude – this is required for correct operation. The internal GPS of the iWAND is used to download the current latitude into the instrument.

Before configuring the latitude, the Lodestar must be turned on as described in *Section 5.5.5.1*.

1. Select **Latitude Config** and then press **Ent**.



2. If the GPS is enabled the iWAND will wait for a valid GPS fix. If operating indoors it may be required to go outside to get a fix – this may take several minutes if the device has just started up.



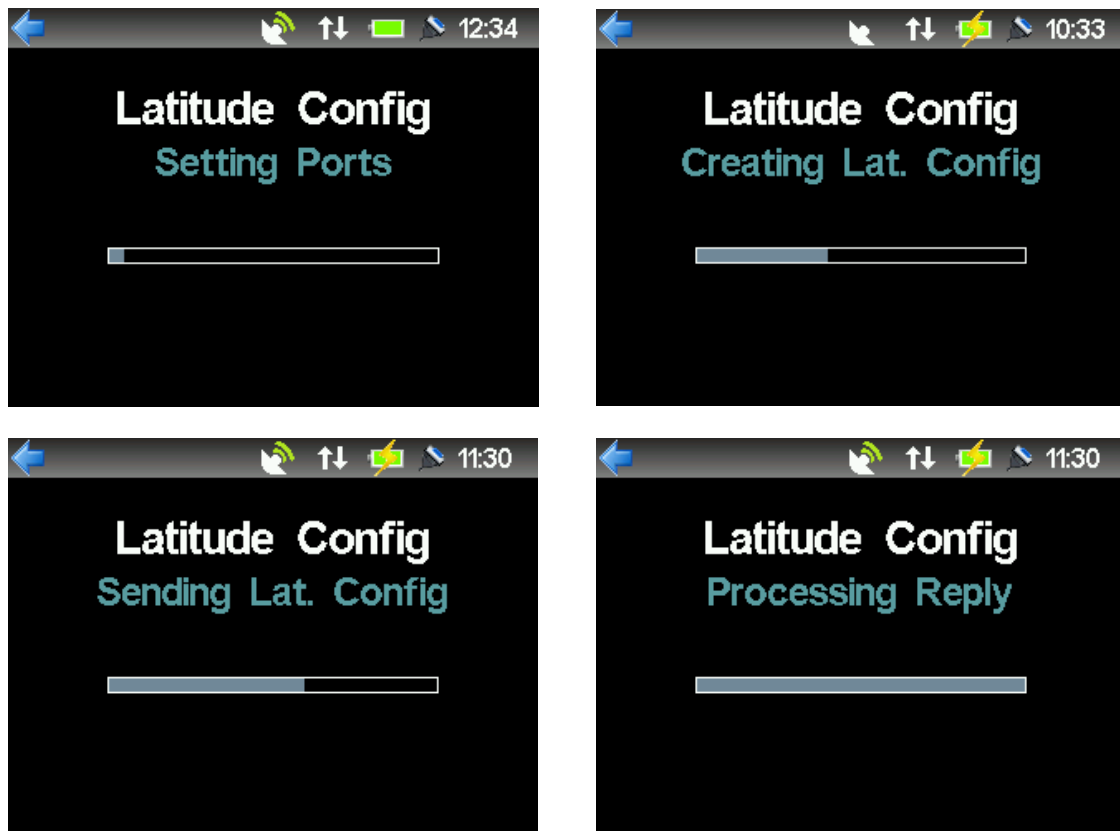
3. If the iWAND cannot obtain a GPS fix **GPS Not Enabled** will be displayed.



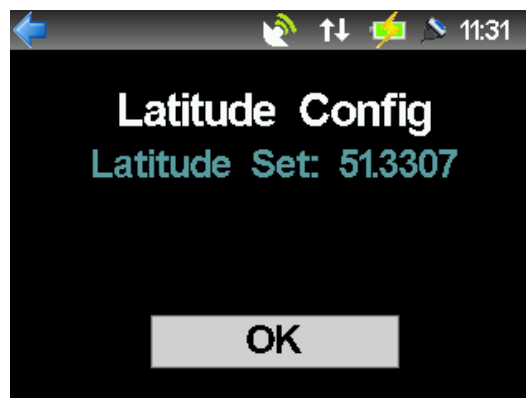
4. When the GPS fix has been achieved, **Ready to Configure** will be displayed and the iWAND is ready to acoustically configure the latitude into the instrument.



5. Press the **ENT** key to continue; the latitude configuration sequence is shown below.



6. On completion the screen will display the **Latitude Set: xx.xxxx** as confirmation the Lodestar has configured as shown below.



Note

If at any point the sequence fails, a **Command Failed** message will be displayed and the display will return to the **Quick Check** menu. The sequence can be run again as required.

5.5.6 Acoustic Check

In the **Acoustic Check** a transfer in both directions (from iWAND to the instrument and a return from the instrument to the iWAND) will occur, with the acoustic quality parameters being displayed.

Figure 5-7 Acoustic Check



Note

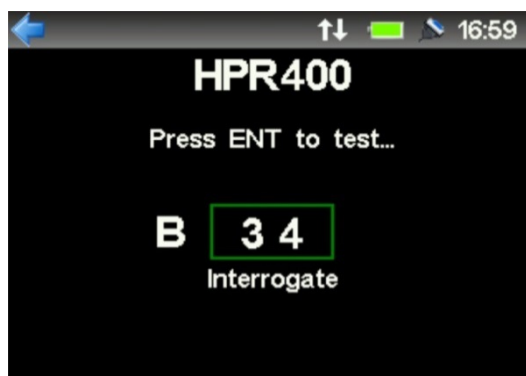


This check may be requested when dealing with Sonardyne customer support.

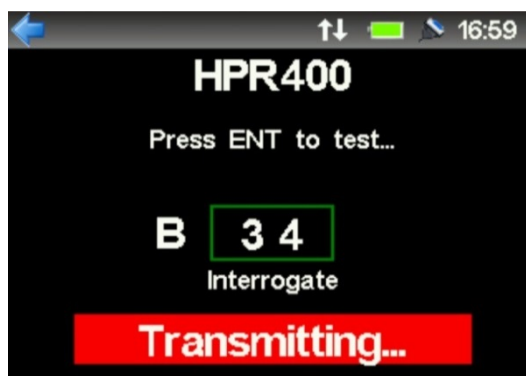
5.5.7 HPR Check

If HPR is enabled on the instrument and the iWAND has been purchased with the required functionality level, an option will be available to test the HPR.

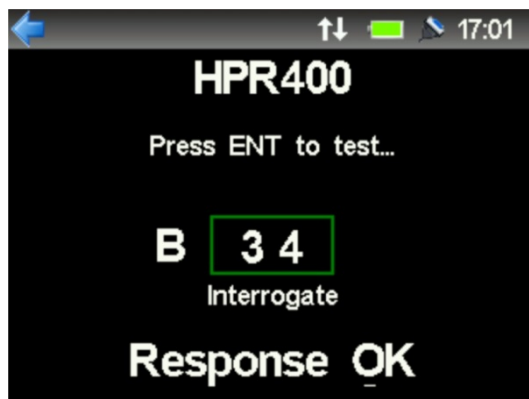
1. Press **ENT** to start the test.



2. The HPR channel will have been configured with the iWAND 6G Configurator software; the test will configure itself to the HPR channel that has been selected.

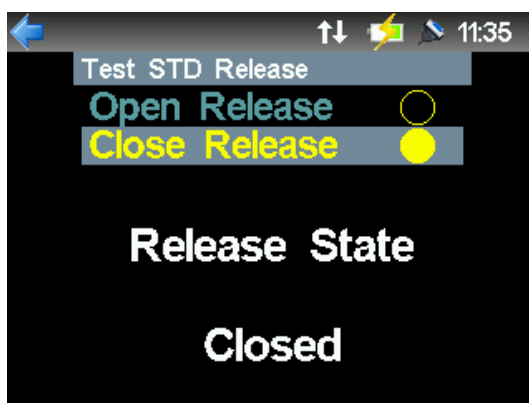


3. **Response OK** will be displayed if a response is detected from the HPR interrogation.



5.5.8 Test Release

If a release mechanism is fitted to the instrument, the menu will allow a functional test to be carried out. The test will start with the menu selecting the current state the release mechanism is in (open or closed). In the example below the release is **Closed**.

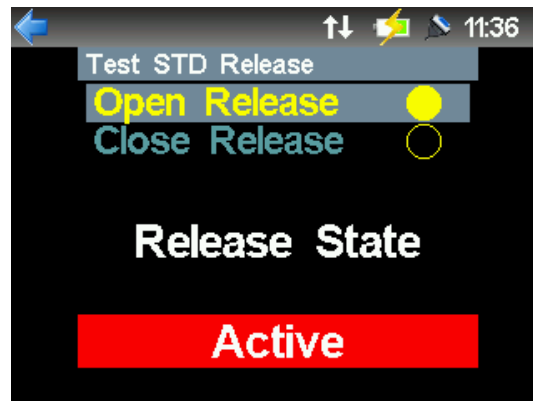


To operate the release mechanism:

1. Make sure the iWAND transducer is held firmly against the transducer of the unit.



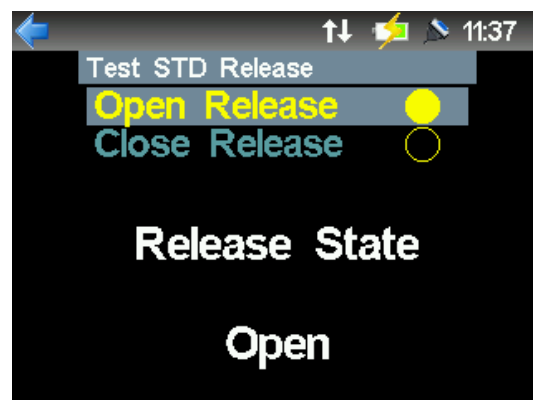
- On the menu, select the required position for the release mechanism and then press **ENT**.



Note

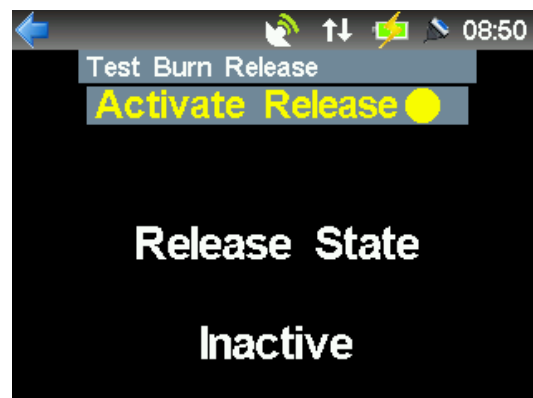
 In the case of rotary (standard and screw) release mechanisms the release motor will drive the mechanism to the requested position whilst the instrument transmits a 'ping' to indicate it is active.

- The new Release State will be displayed.



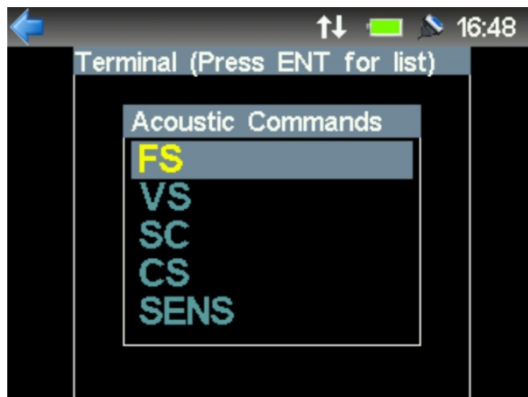
Note

 In the case of non-rotary (burnwire and contact closure) release mechanisms, the test will start with the current state of the release mechanism and will allow the release to be activated if not already active.



5.5.9 Acoustic Terminal

For advanced users the **Acoustic Terminal** allows a raw view the internal 6G command that communicates between the iWAND and the instrument.



The predefined commands are selected on the menu and will be issued to the instrument and the replies shown.



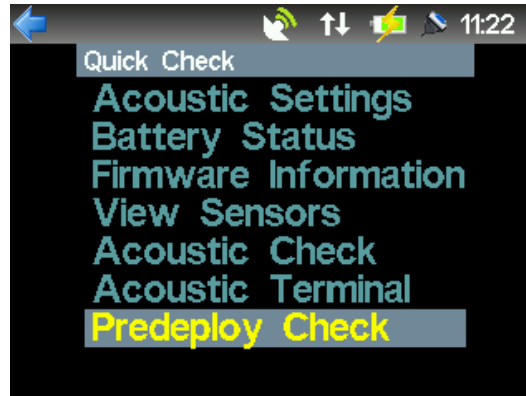
The direction of the data is indicated by the colour of the text.

- Blue is the command from the iWAND to the instrument.
- Yellow is the reply from the instrument to the iWAND

A short history of the communications is maintained; the up and down arrow keys can be used to scroll backwards and forwards through the data.

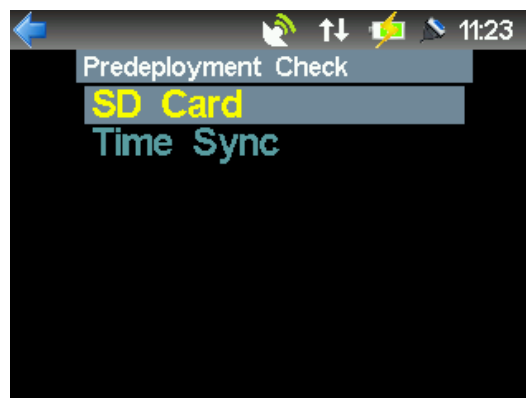
5.5.10 Predeploy Check

The **Predeploy Check** displays the current status of the Instrument's SD card(s) (if present) and synchronises the instrument to GPS time on the back deck.



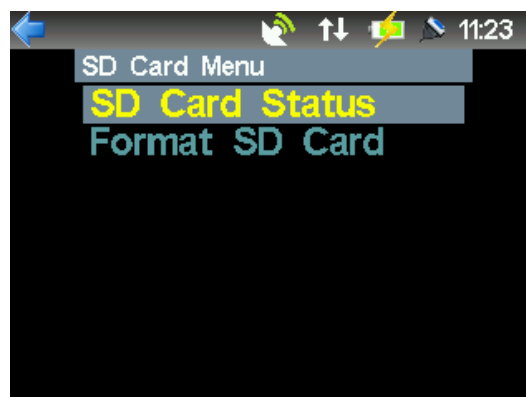
5.5.10.1 SD Card

For autonomous logging deployments it is essential to check the SD card(s) before deployment. To check the SD card(s), select **SD Card** and then press **ENT**.

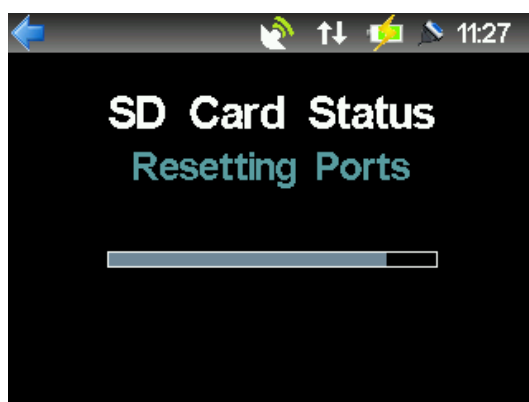
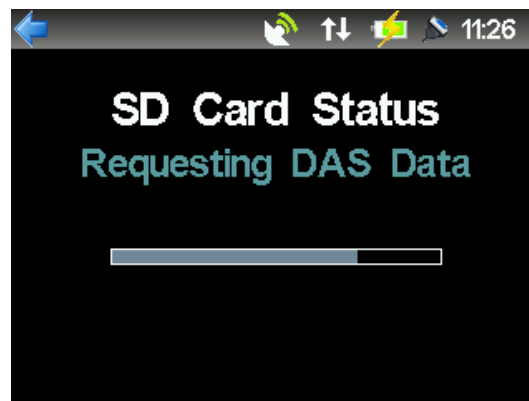
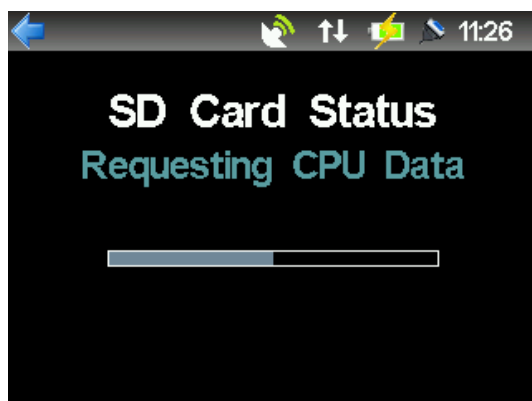
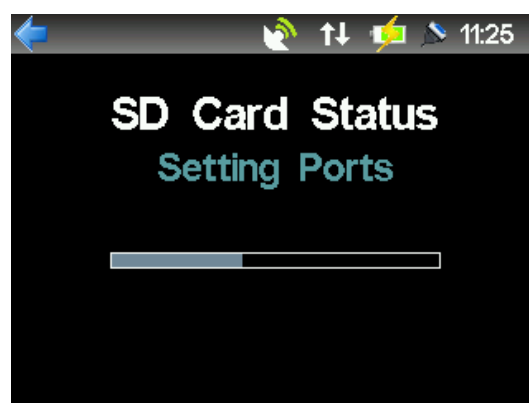
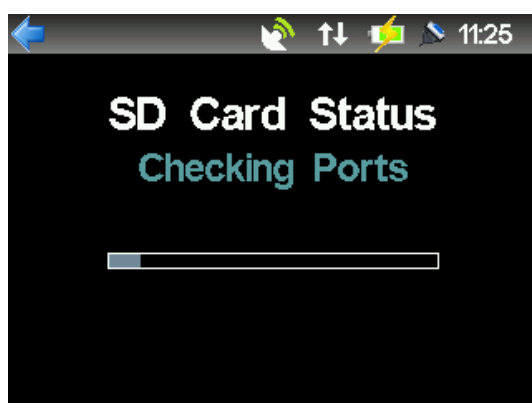
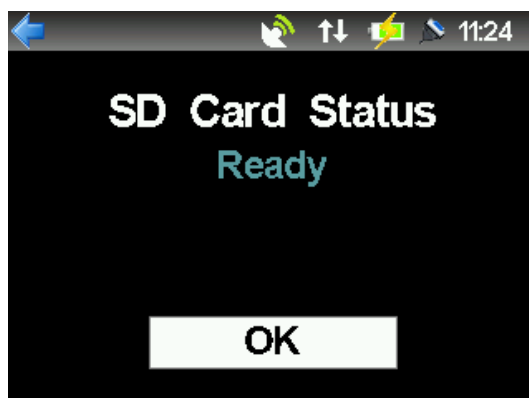


SD Card Status

1. To display the current status of the SD card, select SD Card and then press ENT.



2. The SD card status checking sequence starts.



- When completed, the SD card information is displayed.



If the CPU stat reports anything other than **OK** the SD card will either need to be formatted or there is no SD Card present. If after a formatting the SD card there is no change in status, contact support@sonardyne.com.

Note

 A standard C6 Transponder contains a CPU and a DAS internal 1 GB SD card. Non-standard configurations may contain just a CPU or DAS SD card or neither. If no DAS SD card information is displayed yet the firmware information of the instrument reports a DAS Firmware greater than 2.05T, contact support@sonardyne.com

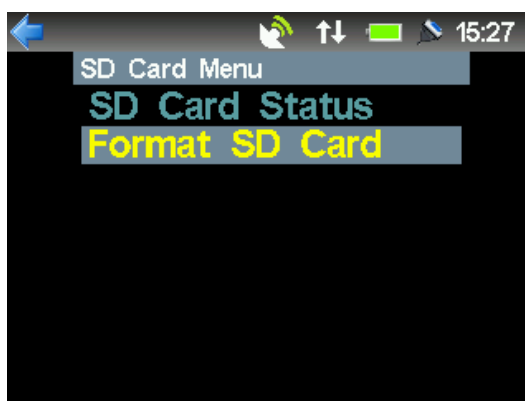
Format SD Card

The CPU SD card must be formatted if it is new or is reporting an error message.

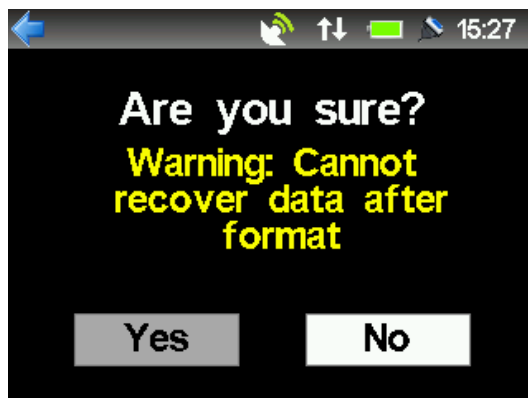
Note

 The formatting process will not affect the data on the DAS SD Card.

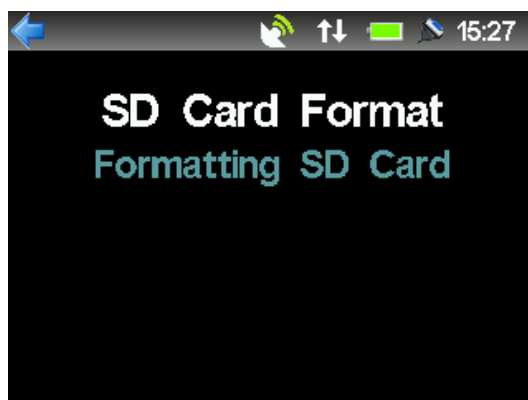
- Select **Format SD Card** and then press **ENT**.



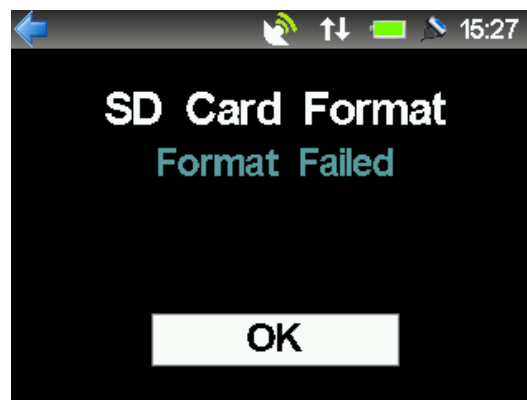
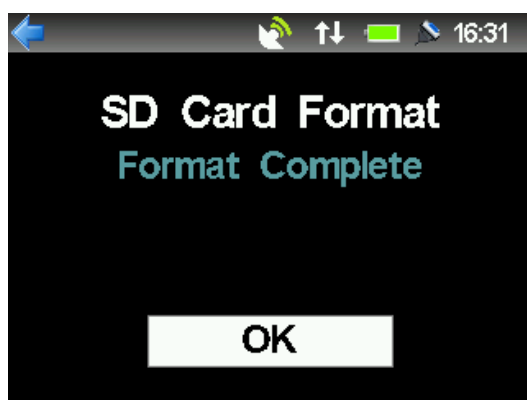
2. Select **Yes** to format the SD card or **No** to cancel the operation after the warning message **Cannot recover data after format** appears.



3. Formatting will start.



4. If the formatting is successful **Format Complete** is displayed, if unsuccessful **Format Failed** is displayed. In the case of **Format Failed**, contact support@sonardyne.com.



5.5.10.2 Time Sync

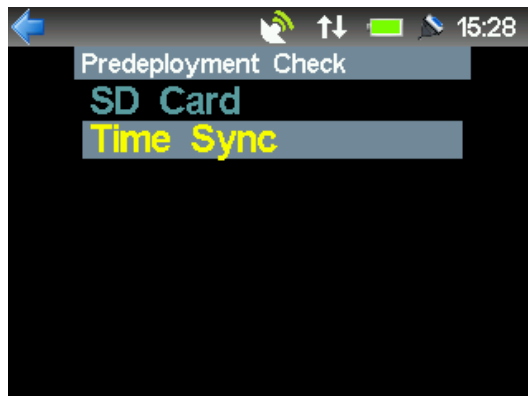
The **Time Sync** function is used to obtain the time difference between the iWand and instrument as well as set the instrument's time using GPS as a reference time frame.

Note

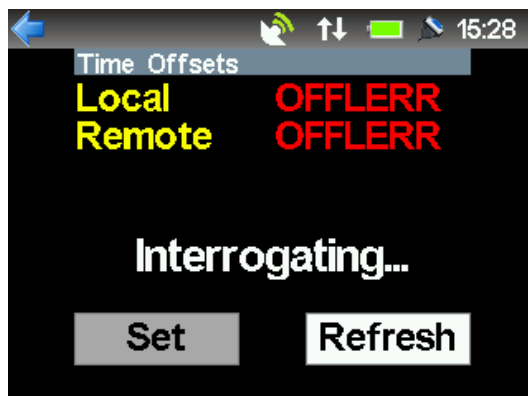
 The iWand offsets may take up to 15 minutes (from powering up the iWand) of uninterrupted GPS in order to start using the time sync because the iWand requires all GPS subframe information for the accurate timing required.

To obtain the current time difference between the instrument and the iWand:

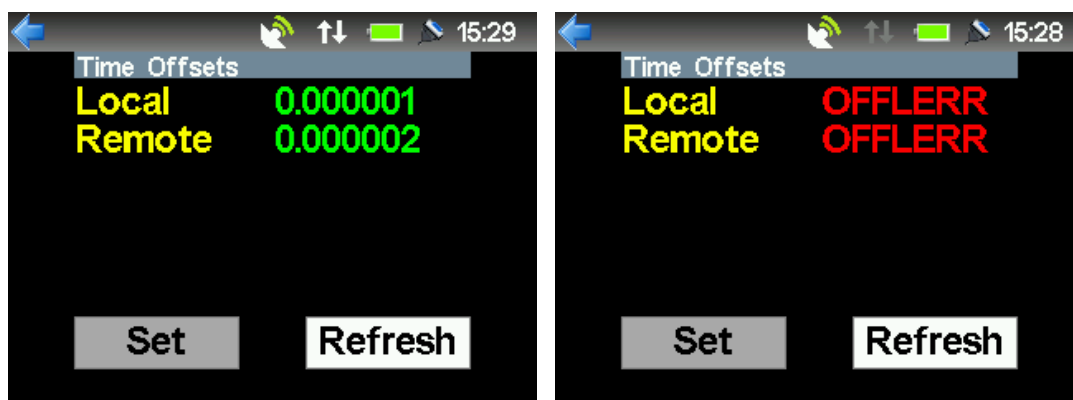
1. Hold the transducer of the iWand against the transducer of the instrument.
2. Select **Time Sync** and then press **ENT**.



3. The instrument is interrogated for its time offsets.

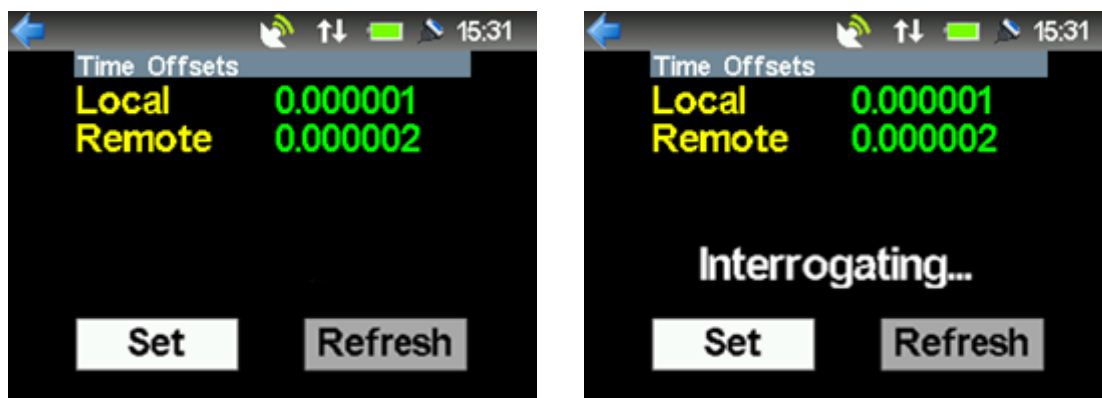


4. The Time Offsets are displayed. If **OFFLERR** is displayed then the local time hasn't met the requirements for time sync (See Note).



5. The colour of the Time Sync value indicates the acceptability of the time offsets to the iWand GPS time:
 - GREEN – time difference between the instrument and GPS is <100 microseconds.
 - ORANGE – time difference between the instrument and GPS is >100 microseconds
 - RED – time difference between the instrument and GPS is >3 milliseconds.

- To set the time offset for the instrument, select **Set** and then press **ENT**.



5.6 Get and Set Configuration

Both **Get** and **Set** operations timestamp the responses collected from the instrument. The iWAND time must be set for these operations to proceed. This can be done by enabling the GPS and leaving the iWAND outside for a few minutes (with a clear view of the sky) or by using the iWAND 6G Configurator software.

5.6.1 Get Configuration

This menu initiates a sequence to collect all the status and settings from the 6G instrument for later upload to the iWAND 6G Configurator software. All data is stored in non-volatile memory inside the iWAND. When connected to a computer running the iWAND 6G Configurator software the data will automatically be downloaded from the iWAND to update the database held by the software.

The **Get Configuration** sequence starts with a Sonardyne 6G Discovery operation to identify the instrument. If the prerequisites for operation have been met (refer to *Section 5.3 "Prerequisites for Operation"*) the sequence will proceed to automatically collect all information required.

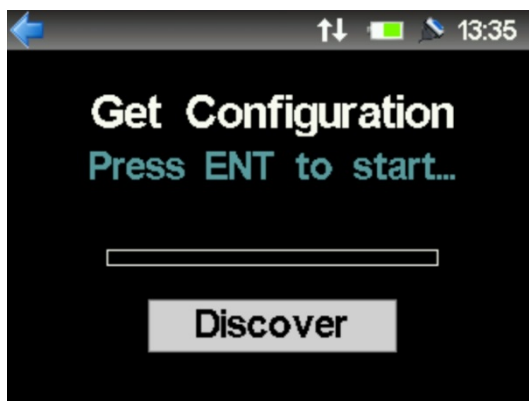
- Select **Get Configuration** on the main menu.



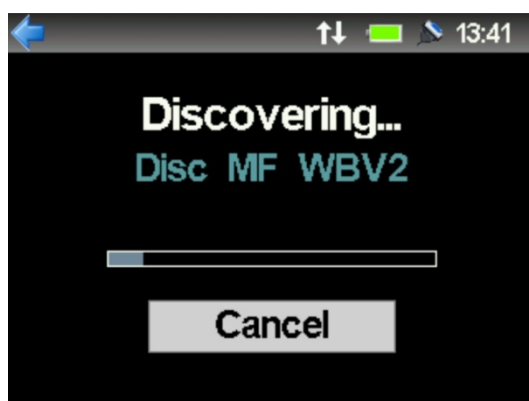
2. Make sure the iWAND transducer is held firmly against the transducer of the unit.



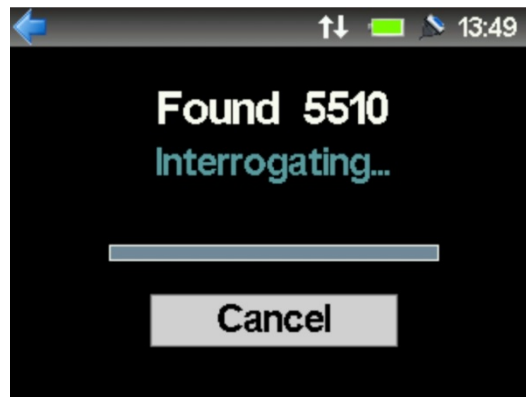
3. To begin the sequence press **ENT**.



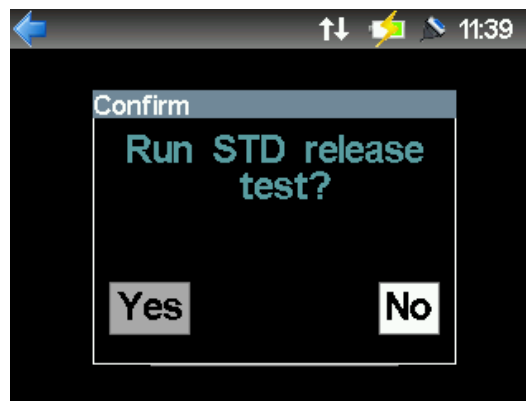
4. The Discovering sequence will begin.



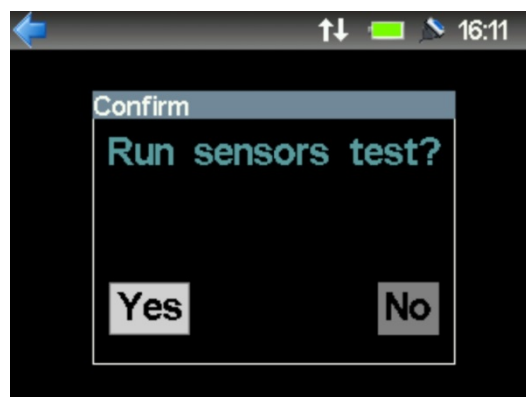
5. When the instrument is found the iWAND will start gathering information.



6. The Get Configuration sequence will confirm if a release mechanism is fitted and if a test is required.



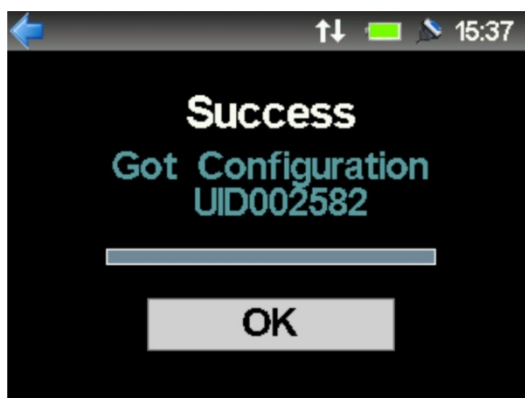
7. If a release mechanism test is to be carried out refer to *Section 5.6.1.1 "Release Test"*.
8. The Get Configuration sequence will ask if a **Sensor Test** is required.



9. If a Sensor Test is required all fitted senses will be tested and the current measurements of each sensor will be displayed.



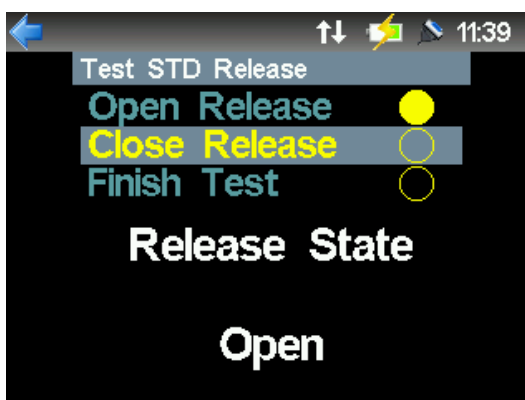
10. On completion of the Get Configuration sequence the iWAND will display the address of the unit and the configuration was successful.



11. At the end of the sequence you will be prompted to run a release mechanism test (to test the release mechanism if one is present) and a sensor test (if the unit has any sensors).

5.6.1.1 Release Test

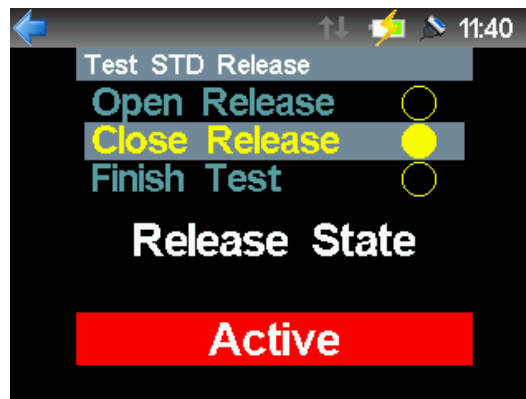
1. If a release mechanism is fitted to the instrument, a prompt will be displayed to allow it to be tested. If **Yes** is selected, the dialogue box will appear.



2. Make sure the iWAND transducer is held firmly against the transducer of the unit.



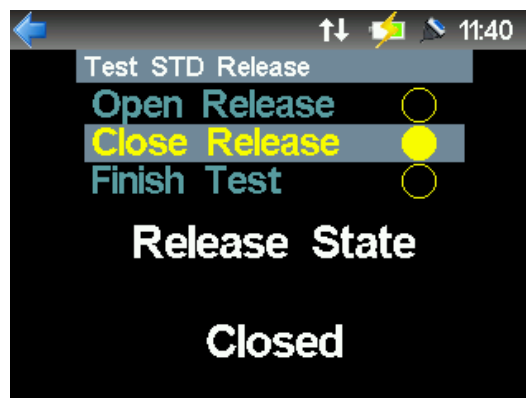
3. On the menu, select the required position for the release mechanism and press **ENT**.



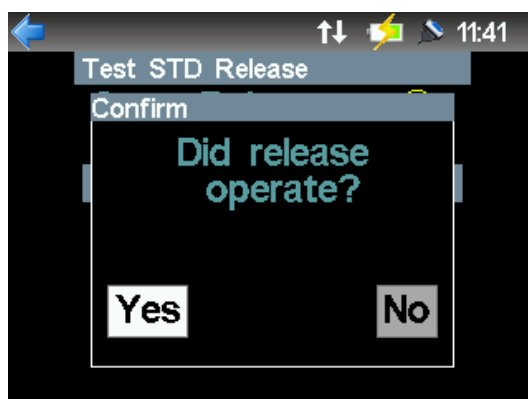
Note

In the case of rotary (standard and screw) release mechanisms the release motor will drive the mechanism to the requested position whilst the instrument transmits a 'ping' to indicate it is active.

4. The new Release State will be displayed.
5. Select **Finish Test** and press **ENT**.



6. Confirm if the release operated by selecting **Yes** or **No**. This response will be stored with the collected settings and presented to the iWAND 6G Configurator software.



Notes

While the mechanical release is operating the unit will transmit periodic pings to indicate it is active. The iWAND transducer must stay in contact with the transducer of the instrument under test until the process is completed, indicated by the *Release State Open* or *Release State Closed*.

It is the operator's decision as to what state the release is left in and how it is exercised.

5.6.2 Set Configuration

After an instrument has been configured by the iWAND 6G Configurator software the settings will be automatically downloaded to the iWAND for delivery when a synchronization process is performed.

When synchronized the iWAND can be unplugged from the computer and moved to the location of the 6G instrument to be configured. Configurations for multiple 6G instruments can be held by the iWAND at the same time.

As described in *Section 5.3* a Sonardyne 6G Discovery operation is performed at the start of the **Set Configuration** sequence. As this operation automatically identifies the 6G instrument, the **Set Configuration** process will automatically download the correct settings for the instrument without user intervention.

To set the configuration:

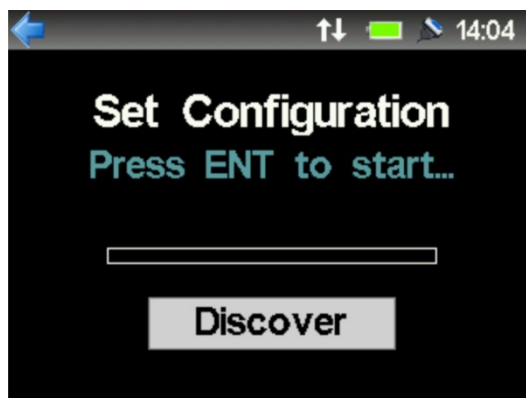
1. Select **Set Configuration** on the main menu.



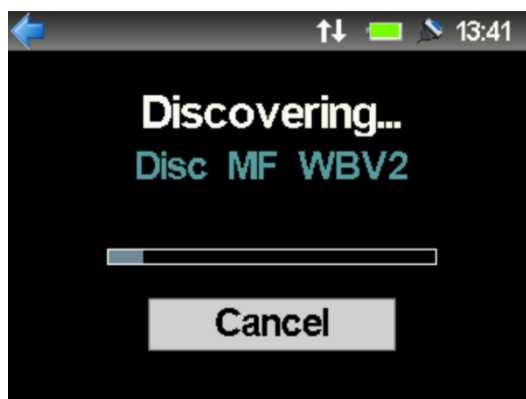
2. Make sure the iWAND transducer is held firmly against the transducer of the unit.



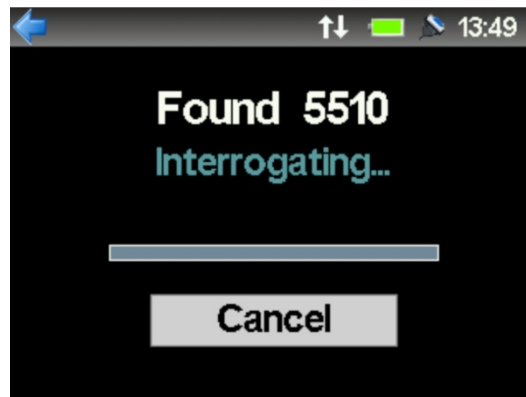
3. To begin the configuration sequence press **ENT**.



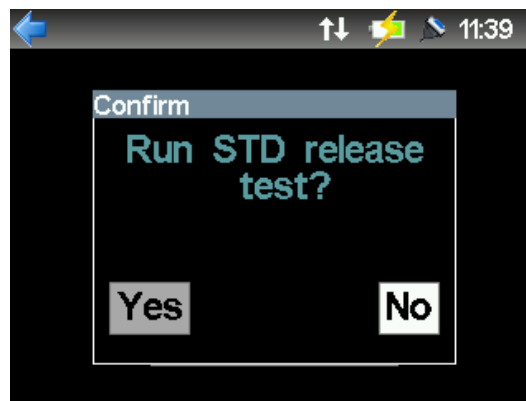
4. The **Discovering** sequence will begin.



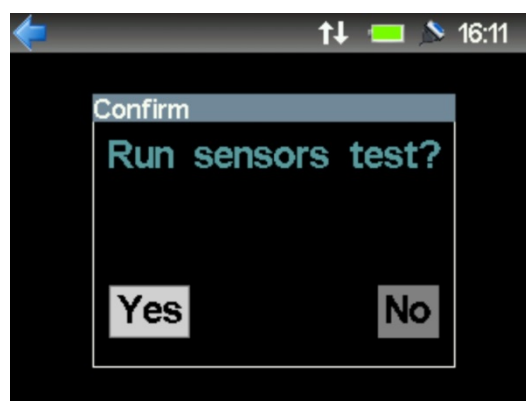
5. When the instrument is found the iWAND will start gathering information



6. The Set Configuration sequence will confirm if a release mechanism is fitted and if a test is required.



7. If a release mechanism test is to be carried out refer to *Section 5.6.1.1 "Release Test"*.
8. The Set Configuration sequence will then ask if a **Sensor Test** is required.
9. Press **Yes** if a sensor test is required.



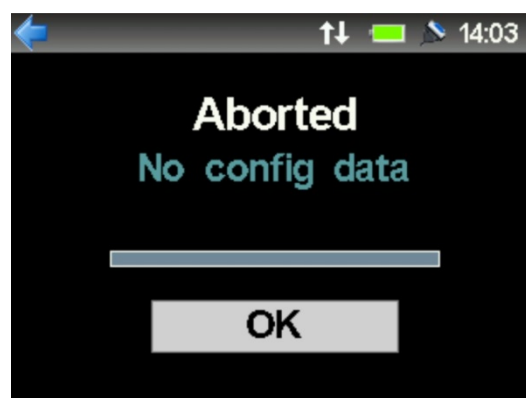
10. All fitted senses will be tested and the current measurements of each sensor will be displayed.



11. On completion of the Set Configuration sequence the iWAND will display the address of the unit and the configuration was successful.



12. If the Set Configuration process detects that no configuration changes are necessary on the instrument it will abort the Set Configuration.



5.7 Tone Testing

These options are to support tone interrogate transponders.

5.7.1 Sonardyne WSM 6

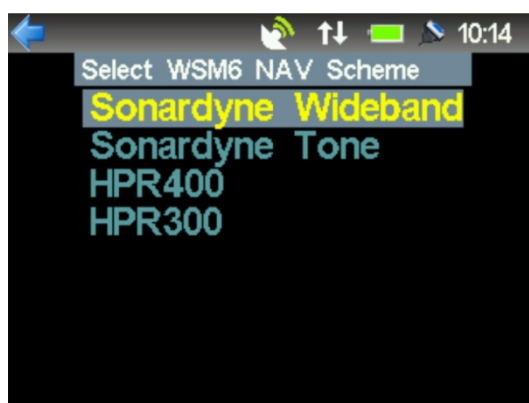
Note

As WSM 6 does not support the 6G Discovery mode, it can only be tested in the Tone Testing mode.

The channel the WSM6 has been configured to must be known. As standard the iWAND allows acoustic testing of WSM6 in Sonardyne Wideband V1, Wideband V2 or Sonardyne tone modes. If the iWAND has been purchased with HPR functionality it can be used to test the WSM6 in HPR300 and HPR400 modes.

Select the appropriate mode based on the WSM6 configuration as setup in the WSM Terminal and then press **ENT**.

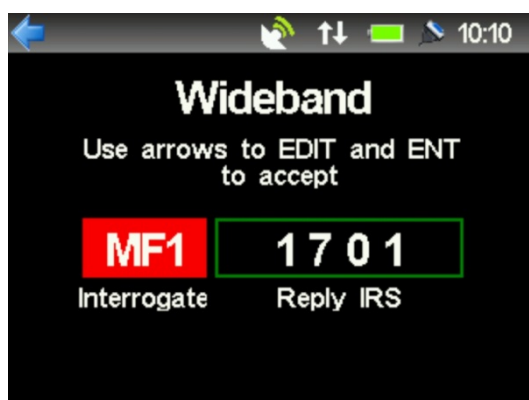
Figure 5-8 Selecting Correct Mode for WSM 6



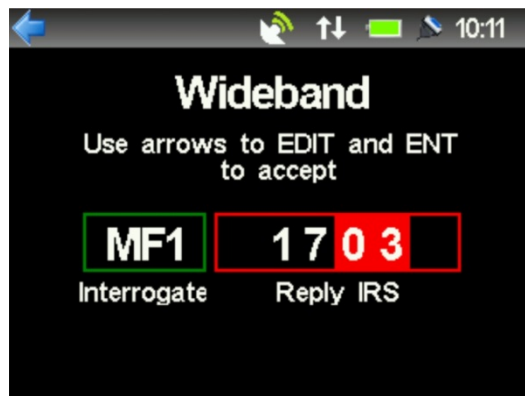
5.7.1.1 Sonardyne Wideband Mode

When the WSM6 has been configured in Sonardyne Wideband V1 or Sonardyne Wideband V2 mode the Sonardyne Wideband option should be selected. This allows the tone interrogate channel and Sonardyne Wideband reply address to be configured.

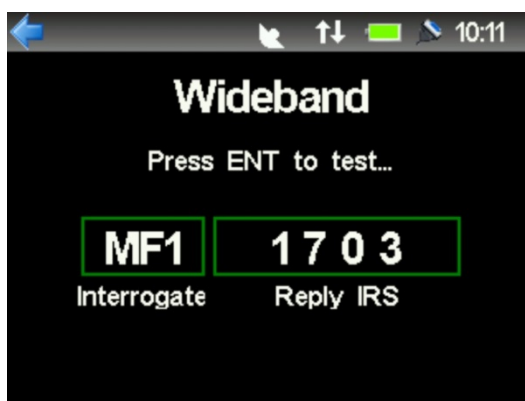
Figure 5-9 Interrogation Channel Selection



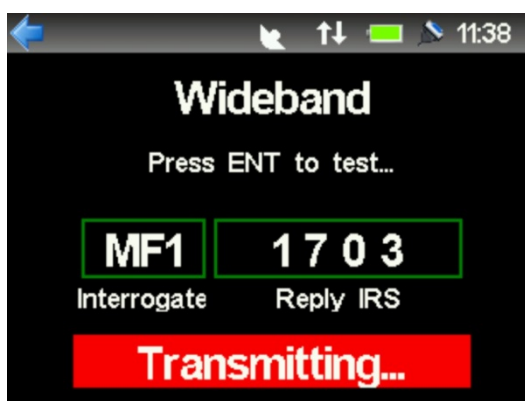
1. On entry the interrogation channel selector will be selected. Press the **UP** and **DOWN** keypad keys to change the channel.
2. Select the appropriate interrogate channel and press **ENT** to move onto the reply address selector.



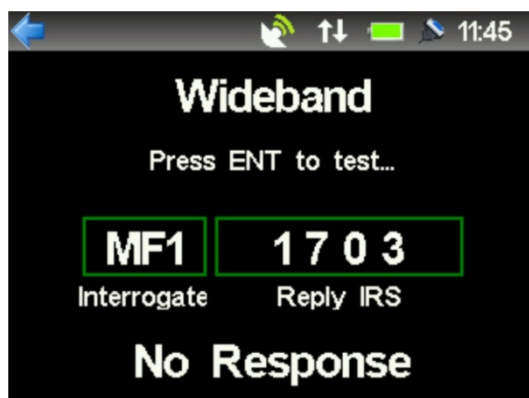
3. Once the reply IRS channel is correct press **ENT** to accept. Further **ENT** presses will trigger an interrogation cycle. **UP**, **DOWN** or **RIGHT** button presses will re-enter the edit cycle.



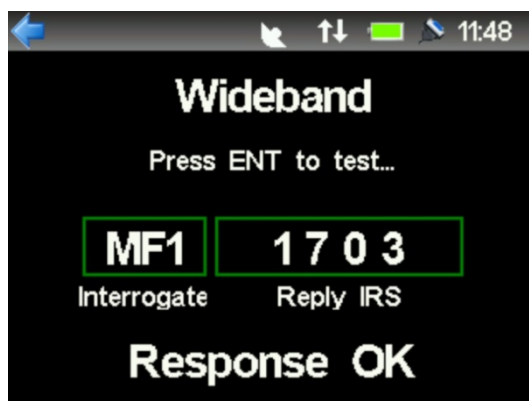
4. On every press of the **ENT** button the transmitting state will be shown. This will stay active while the interrogate transmission is transmitted and either a reply is received or the request times out.



5. If a reply isn't received or the request times out **No Response** will be displayed.



6. If a reply is received **Response OK** will be displayed.



5.7.1.2 Sonardyne Tone Mode

The operation of Sonardyne Tone mode is identical to Sonardyne Wideband mode except the selection of the reply channel is a Sonardyne Tone rather than a Sonardyne Wideband address.

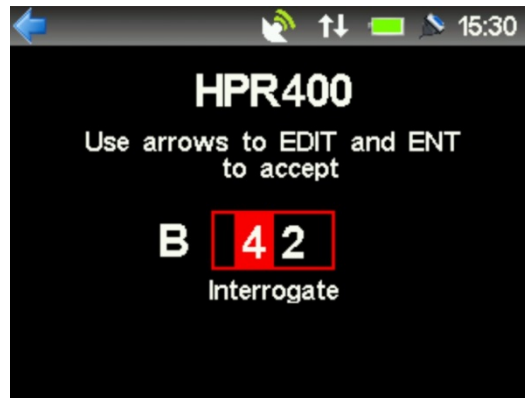
Figure 5-10 Sonardyne Tone Mode



5.7.1.3 HPR300 / HPR400 mode

In HPR300 or HPR400 mode only the interrogate channel is configured – the reply channel is defined by the interrogate channel. Operation is identical to Wideband mode described in *Section 5.7.1.1*.

Figure 5-11 HPR400 Mode



5.7.1.4 Legacy HPR

This mode is included to support other types of transponder compatible with HPR300 / HPR400. This option is only available if the iWAND has been purchased with HPR functionality enabled. It is functionally identical to the HPR300 / HPR400 tests in the Sonardyne WSM6 tests described in *Section 5.7.1.3*.

Note



When using the iWAND with legacy or third party transponders Sonardyne cannot guaranty compatibility even if they are configured for HPR300/HPR400 due to the low transmit power of the iWAND.

Section 6 – Maintenance

6.1 Introduction

Before any maintenance is performed, make sure *Section 2 – Safety* is read and fully understood.

6.2 Scheduled Maintenance and Recalibration

There is no calibration associated with the iWAND.

6.3 General Maintenance

Make sure the iWAND is kept clean and dry whenever possible. The screen area has an anti-glare coating. Do not use any abrasive cleaning materials when cleaning the screen..

Make sure the rubber bung over the communications connectors is in good repair and maintains a good fit to protect the end cap connectors from direct water ingress and moisture.

Section 7 – Functional Test

7.1 Running Self-Test

Running a self-test on the iWAND hardware can be performed on the menu system from **iWAND Setup > Test iWAND** at the bottom of the menu. This will perform a series of functional tests on the internal electronics including:

- User interface buttons
- Display
- Display backlight
- GPS (if enabled)
- Internal accelerometer
- Internal electronics

7.2 Running an External Unit Test

To verify the iWAND is operational a simple quick check to a known working 6G transponder meeting the requirements described in *Section 5.3 “Prerequisites for Operation”* will exercise all acoustic functions of the unit along with the iWAND transducer.

Section 8 – Firmware Upgrade

8.1 Introduction

The firmware update requires the Sonardyne 6G Terminal Lite software to be installed on a PC. 6G Terminal Lite can be found on the Sonardyne 6G Utilities CD 8300-102.

For more information refer to *UM-8300-099 “6G Terminal Lite”, Section “Firmware Update”*.

8.2 Firmware Upgrade Procedure

Upgrading the firmware in the iWAND can only be carried out by means of the USB or the RS232 connection. To connect to the iWAND USB refer to *Section 4.4.2 “USB”*; to connect to the RS232 refer to *Section 4.4.3 “RS232/RS485 Connection”*.

Note



Firmware upgrade using the RS485 or Bluetooth is NOT supported.



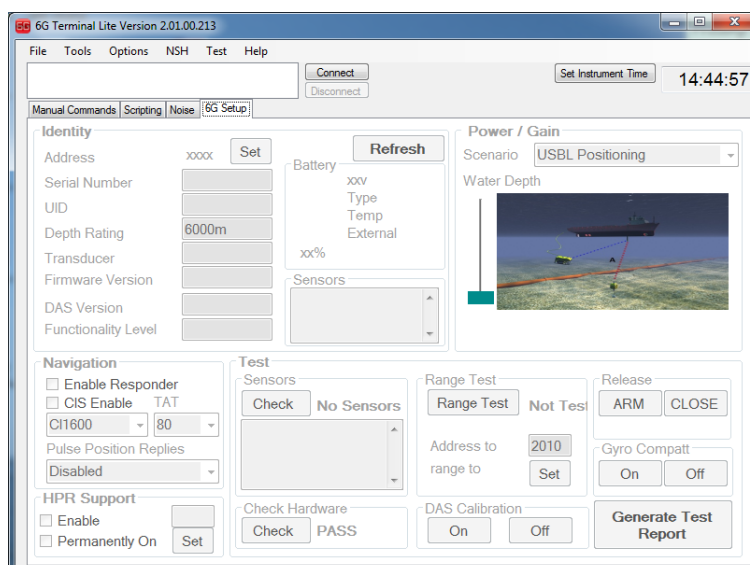
If upgrading through the RS232 connection make sure the USB cable is NOT connected to the iWAND at the same time.

To upgrade the firmware in the 8315 iWAND:

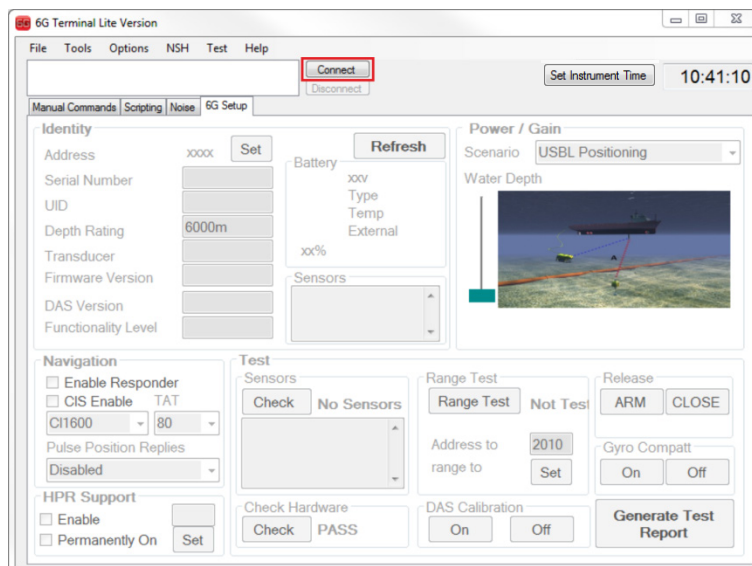
1. Make sure the iWAND is switched **ON**.
2. Connect either the USB or the RS232 serial cable to the iWAND. **Do not connect both**.
3. Connect the USB or the RS232 serial cable to the PC.
4. Start the 6G Terminal Lite software by double-clicking the desktop icon.



5. The 6G Terminal Lite software will open on the 6G setup tab.



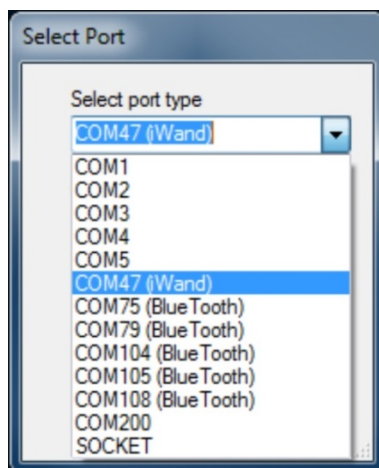
6. Make sure the 6G Terminal Lite version is 2.01.00.149 or later. To locate the version of the software click **Help > About 6G Terminal**.
7. Click **Connect**.



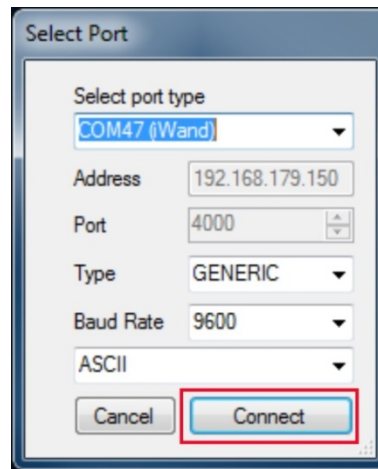
8. In the **Select port type** drop-down list, select the COM Port the iWAND is connected to.

Note

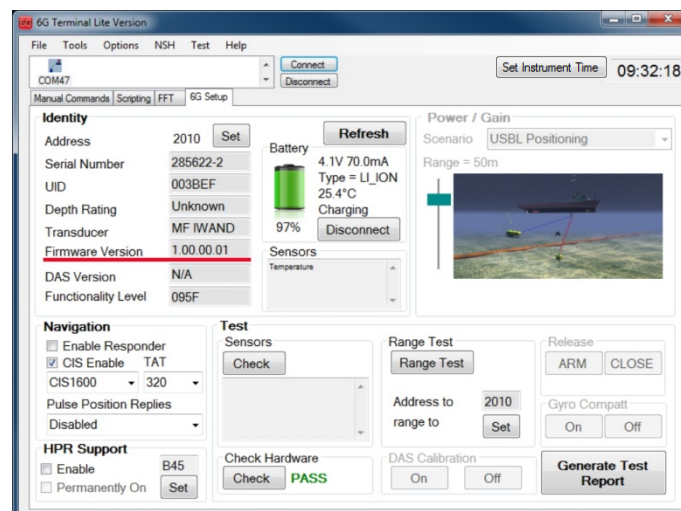
 For standard RS232 ports select the port the iWAND is connected to. If the iWAND is connected via the USB the COM port will have (iWAND) next to the port name.



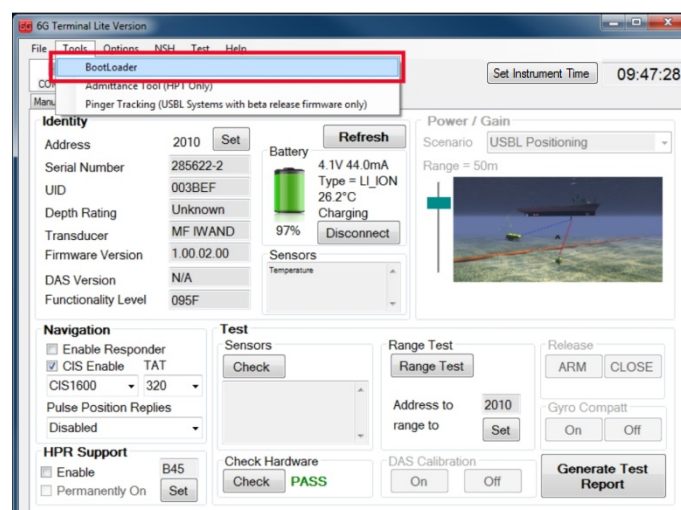
9. Click **Connect**.



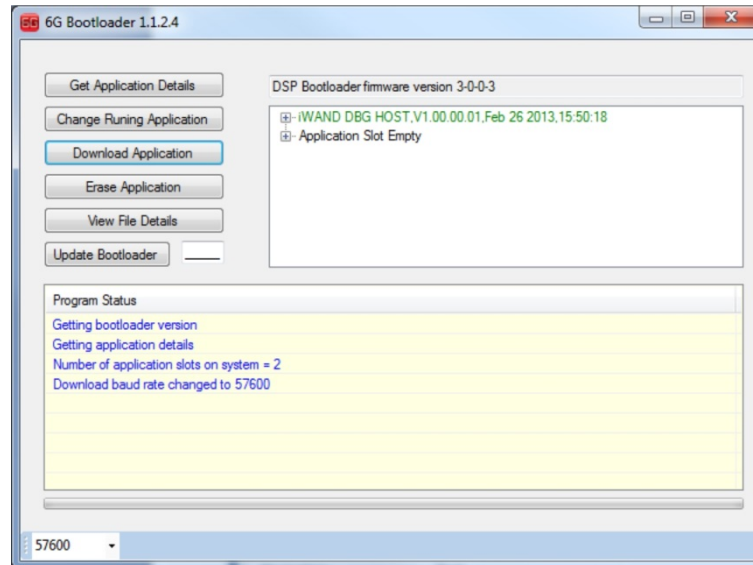
10. The 6G Terminal Lite window will populate with the current configuration of the iWAND, including the current firmware version.



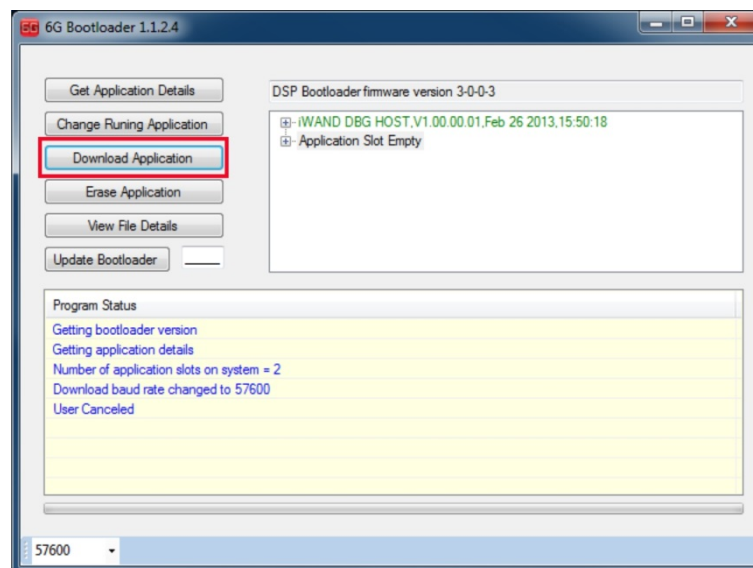
11. Start 6G Bootloader to update the firmware. In the 6G Terminal Lite dialog box, click **Tools > Bootloader**.



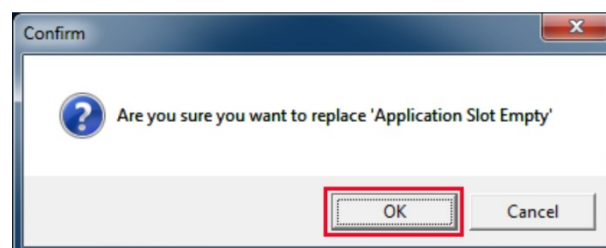
12. The iWAND will reset followed by the 6G Bootloader window opening.
13. In the list, the currently running firmware is displayed in green text. The black text is old or unused firmware.



14. Click the black firmware text to select it and then click **Download Application**.



15. Click **OK** to confirm the firmware is to be replaced.



Note



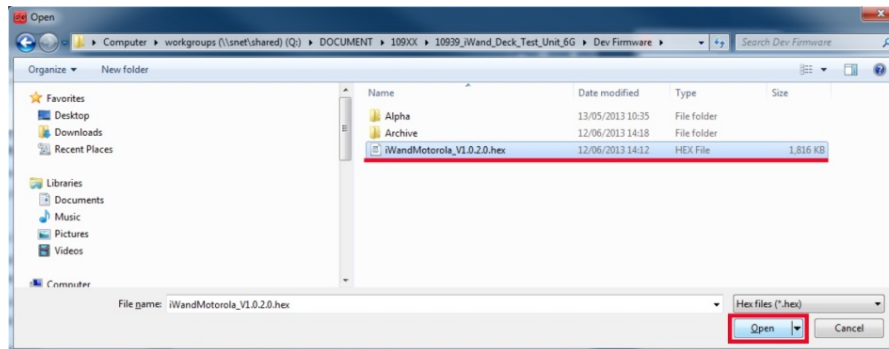
The new firmware will be provided by Customer Support and should be saved on the PC.

16. A window will appear to select the firmware file (.HEX) to download.

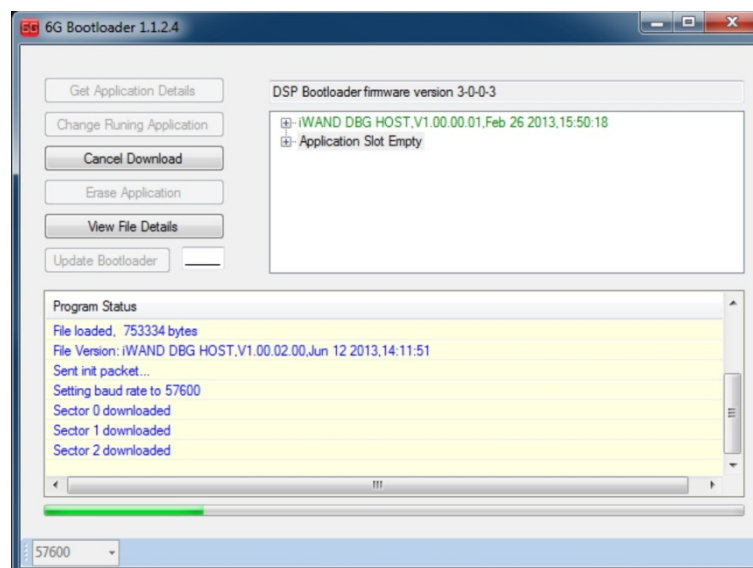
CAUTION

Equipment Inoperable. Incorrect Firmware will render the iWAND inoperable. Make sure the correct firmware file is selected.

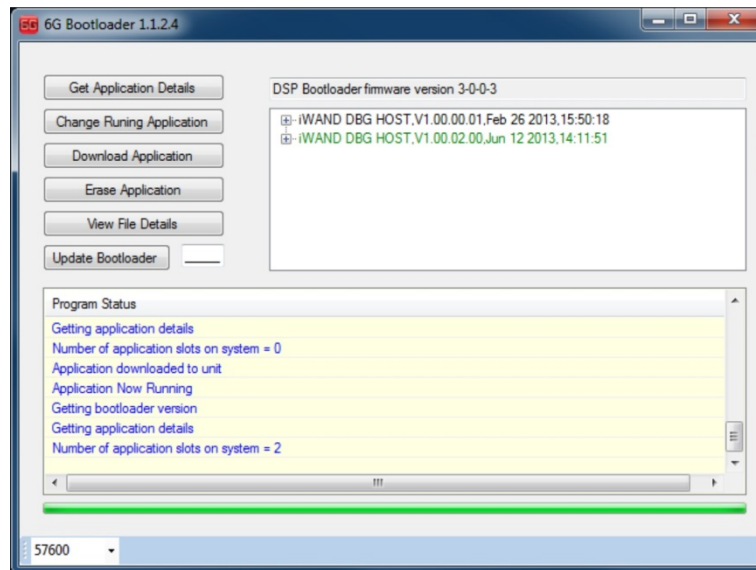
17. Navigate to the location of the new firmware file.
18. Select the file and click **Open**.



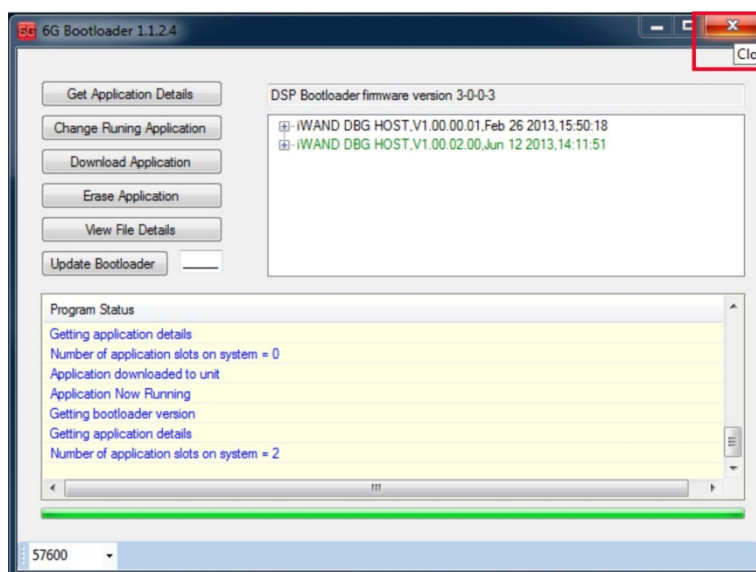
19. The file will automatically start to download and install the new firmware version.



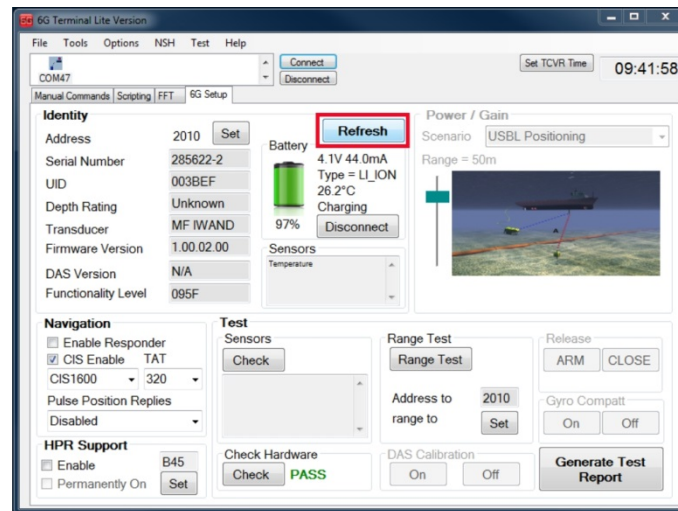
20. The new firmware will display in green text.



21. On completion of the download the bootloader programme can be closed. The iWAND will reset with the new firmware.



22. After the reboot of the iWAND the 6G Terminal Lite settings should refresh and the new firmware will be displayed. If the software does not update automatically click **Refresh**.



Section 9 – Fault Diagnosis

9.1 General Operation

The following section assists in diagnosis of problems that may occur when operating the iWAND

9.1.1 Unit Does Not Power On When a Key is Pressed on the Keypad

If the iWAND has been turned off for shipping or reset with the reset magnet for more than a few seconds it will require insertion of the USB cable (connected to either the charger or a computer) to restore power. With the cable plugged in, press a button on the keypad to power on.

If the iWAND still fails to power on, the battery may be flat – leave the iWAND plugged into the supplied charger for approximately four hours and then retry.

9.1.2 Unit Not Responsive

If the iWAND becomes unresponsive it can be reset by holding down the **UP** and **DOWN** arrow keys together on the keypad for more than 3 seconds. If it is serially connected it can be reset by sending a serial BREAK of > 30 ms.

9.2 PC Communications

9.2.1 Bluetooth not Functional on Windows XP

Windows XP is currently not supported via a Bluetooth connection with 6G Configurator.

9.2.2 USB not Communicating

Make sure the USB driver has been installed correctly as described in *Section 4.4.2.1*. If the USB Communications Port is present and the iWAND is failing to talk to the 6G Configurator software, unplug the USB lead from the unit and plug it in again. If that fails, power cycle the unit (hold down the ENT button for > 5 seconds).

USB can be sensitive to electrical disturbances from close proximity power systems and motor drives. If problems persist consider moving the iWAND and PC to an electrically quieter environment.

9.2.3 Acoustic Communications

For successful communications the iWAND transducer should be firmly held against the transducer of the Sonardyne 6G instrument being interrogated. Make sure the criteria outlined in *Section 5.3 "Prerequisites for Operation"* have been met for the instrument being interrogated.

If problems persist ensure the frequency band is correct for the instrument being interrogated. If in doubt use the **iWAND Setup > Discovery Options > Enable All Bands** to make sure the discovery band required has not been disabled. If using the iWAND as a transceiver make sure the FS response has the correct band configured - use **iWAND Setup > Acoustic Band** to select the correct frequency band.

Section 10 – Storage

10.1 Storing the iWAND

The iWAND when not in use should be stored in the protective transit case shipped with the product. Make sure the housing is clean and dry before returning to the case.

Avoid leaving the iWAND in a deeply discharged state for extended periods. To turn off the iWAND for storage and shipping: **iWAND Setup > Power Saving > Off for Shipping**.

Make sure the conditions for storage comply with the Environmental requirements outlined in *Section 11.4 “Environmental”*.

Section 11 – Technical Specifications

11.1 Acoustics

Parameter	Specification
Operating Frequency	LMF (14–19 kHz) MF (19–34 kHz) HMF (34–40 kHz)
Transducer Beam shape (Wand)	Directional

11.2 External Power

Parameter	Specification
External Supply Voltage	Nominal 5 V DC (USB)
Operating Range	5 V USB
Maximum Current	500 mA USB powered / 800 mA USB charger powered
Charging Type	USB to PC or USB to Wall Adaptor

11.3 Battery

Battery Type		Capacity	Voltage range
Lithium polymer		1.3 Ah	4.2 to 3.0 V
Battery Life*	Active (Screen on)	>5 Hours (Screen Automatically Turns Off After a Selectable Period)	
	Active (Screen off)	>12 Hours (Press a Key or 'Shake to Wake' to Turn Screen Back On)	
	Sleep (Screen off)	>3 Months (Press a Key to Wake)	
	Deep Sleep	>1 Year (Requires USB Connection To Wake-Up)	

*To prolong the battery life it is recommended to store the iWAND in the temperature range of +15 to 35°C

11.4 Environmental

Parameter	Specification
Temperature Operation	-10 to +55°C
Temperature Storage	-10 to +55°C (see note below)
Rated for Outdoor use	IP65

11.5 Mechanical

Item		Specification
Case		Rugged Polypropylene Copolymer Case with Styrenic Over Mould Shock Protection
Keypad		Sealed 5 Key Navigation Pad
Display		320 x 240 Sunlight Readable LED Display
Connections	USB	Splash-Proof Mini-USB Type B IP67
	Serial	9-way D-Type (Male) IP67
	Bluetooth	V2.1 + EDR Class 2 (+4 dBm)
	BNC	Acoustic Wand
Dimensions		276 mm (L) x 84 mm (W) x 40 mm (D)
Weight		Weight 0.8 kg

11.6 Firmware Requirements

For correct operation the iWAND requires the following firmware versions (or later) in the unit being interrogated:

Sonardyne 6G Product	Minimum Firmware Version
Compatt 6 / AMT	V3.05.07.09*
WMT / AvTrak 6	V3.02.02.09
ROVNav	V3.03.04.09
WSM 6	All firmware versions (tone testing ONLY)

Appendix A – Firmware History record

A.1 Firmware History Record

This table is a history and record of all firmware installed into the equipment.

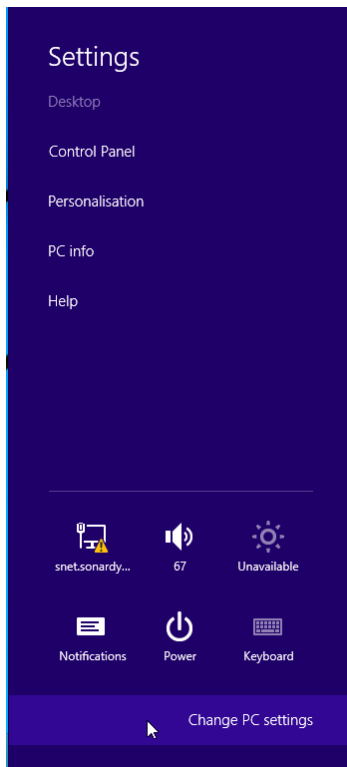
[illegible]

Appendix B – Windows 8 Driver Installation

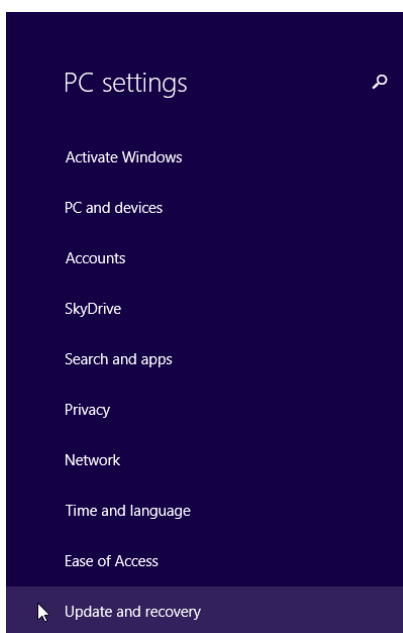
B.1 USB Driver Installation on Windows 8

In some configurations Windows 8 will not allow installation of digitally unsigned drivers. The driver provided with the iWAND for the USB interface is not digitally signed so the following procedure should be followed when installing it.

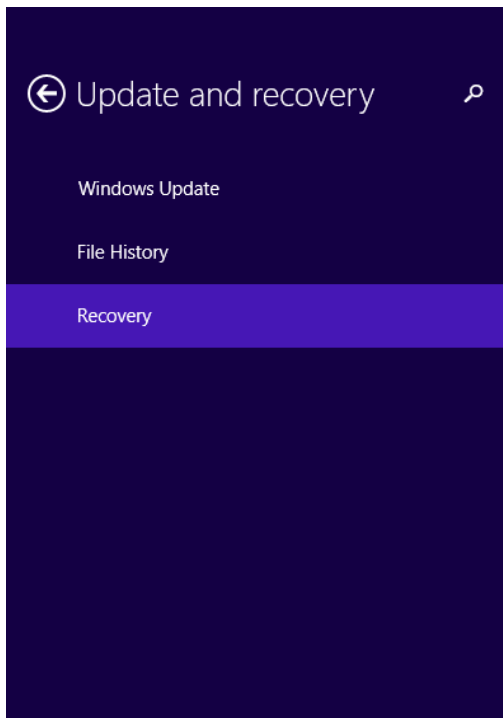
1. On the Windows 8 computer click **Change PC settings**.



2. Click **Update and recovery**.



3. Click **Restart now**.



Refresh your PC without affecting your files

If your PC isn't running well, you can refresh it without losing your photos, music, videos and other personal files.

Get started

Remove everything and reinstall Windows

If you want to recycle your PC or restart completely, you can reset it to its factory settings.

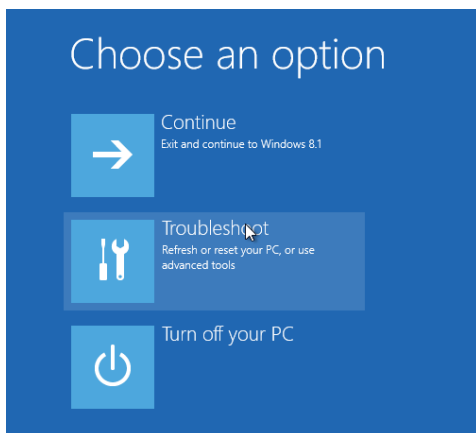
Get started

Advanced start-up

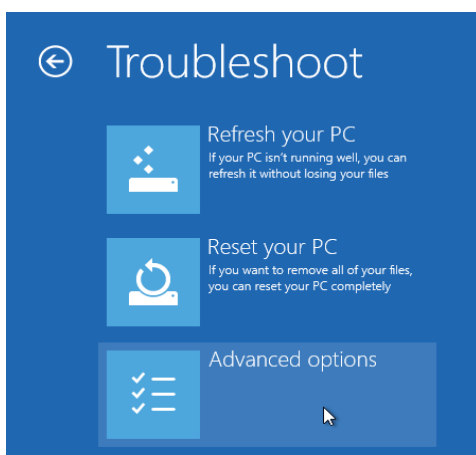
Start up from a device or disc (such as a USB drive or DVD), change Windows start-up settings or restore Windows from a system image. This will restart your PC.

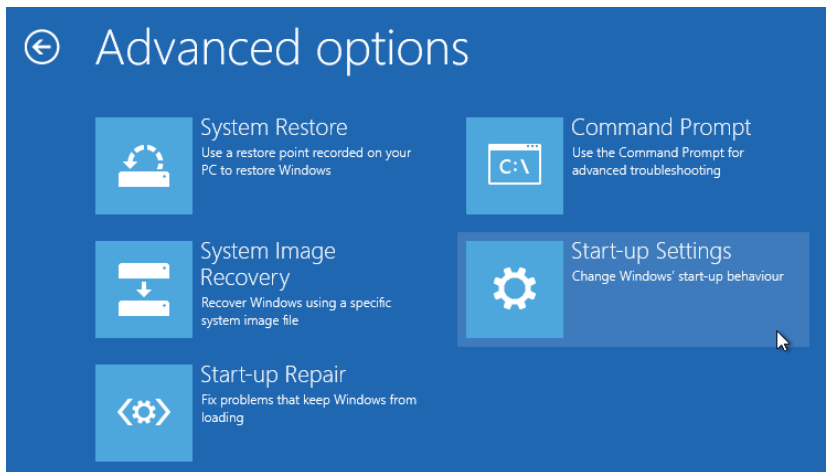
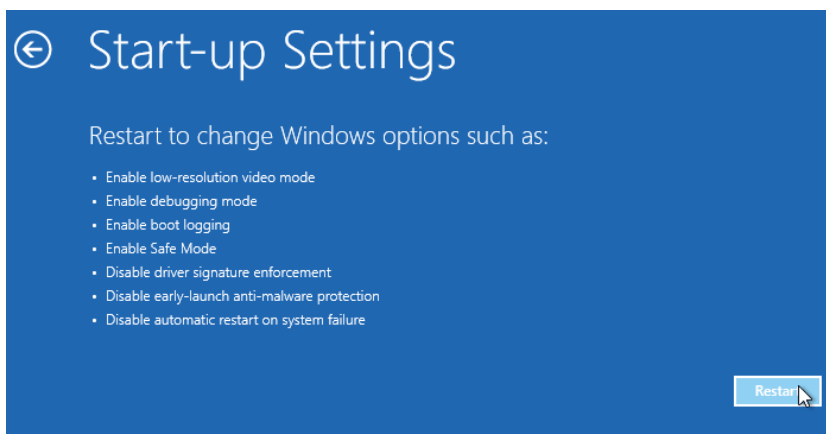
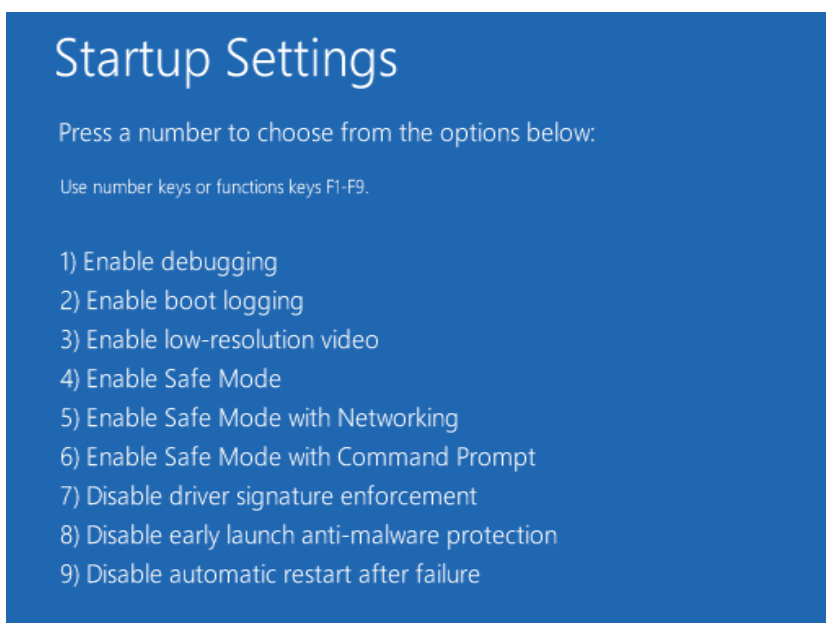
Restart now

4. Click **Troubleshoot**.



5. Click **Advanced options**.



6. Click **Start-up Settings**.7. Click **Restart**.8. Select option 7 **Disable driver signature enforcement**.

9. The driver should install as described in Section 4.4.2.

Definitions

Term	Definition
6G [®]	Sonardyne's sixth generation technology hardware platform.
Acoustic Responder	An instrument that emits an acoustic signal in response to an electrical signal carried to it by cable.
Acoustic Signal	Information carried by sound pressure waves through water. The Sonardyne acoustic signal has a finite length.
Acoustic Synchronous / Precision Pinger	An instrument that emits signals regularly without an interrogating signal. A SYNCHRONOUS Pinger can be synchronised to an external master signal. A PRECISION Pinger has an accurate internal time standard.
Acoustic Transceiver	An instrument that emits and receives acoustic signals, and extracts information from them. Transceivers can measure the time it takes a signal to travel from its transducer to a transponder and return. Some can encode and send data in a message and extract digital data from a message (Acoustic Telemetry). Used on a surface vessel or to mark a point on the seabed, or fixed to a mobile for tracking or positioning.
Acoustic Transducer	A device that converts electrical signals into acoustic signals and vice versa.
Acoustic Transponder	An instrument that emits an acoustic signal when it detects an interrogating acoustic signal.
Acoustic Transponder (Intelligent Transponder)	A type of transponder that is managed by a micro-controller. Examples include the COMPATT (COMPUting And Telemetry Transponder) and the WMT (Wideband Mini Transponder). Depending on supported functionality it can: Decode acoustic telemetered commands from a transceiver and can send telemetered data to the transceiver. It can measure the distance between itself and other transponders and then telemeter the data to a transceiver. It can be capable of measuring its depth and the temperature of the water. It can be used to measure a variety of underwater parameters and telemeter these back to the surface. It can be used, as an intelligent angle-measuring device, in a Riser Angle Monitoring System. It can be fitted with a release mechanism so it can return, on command, back to the surface e.g. if battery power is low.
Attitude and Heading Reference System (AHRS)	An inertial sensor that provides outputs of heading, pitch and roll.
BOP	Blowout Preventer
COMPATT	COMPUting and Telemetry Transponder (see Acoustic Intelligent Transponder)
Common Reply Signal (CRS)	A reply signal common to a complete family of addressed transponders.
Global Positioning System (GPS)	A multi-user, 24-hour, worldwide radio navigation system using the NAVSTAR constellation of satellites. GPS receivers are capable of tracking and decoding data from the satellites and using it to compute the position and velocity of a vehicle.
ROV	Remotely Operated Vehicle
Sonardyne	Sonardyne International Limited and its affiliates.

Term	Definition
Sonardyne Wideband®2	6G® transponders and transceivers use Sonardyne Wideband® 2 ultra-wide bandwidth signals giving a faster and robust transmission of data, more precise ranging and mitigation from multipath in shallow water and amongst steel structures in deep-water.
USB	Universal Serial Bus
UTC	Universal Time Coordinates

Global Headquarters, UK

Blackbushe Business Park
Yateley
Hampshire
GU46 6GD, UK
T. +44 (0) 1252 872288
F. +44 (0) 1252 876100
sales@sonardyne.com

Rio das Ostras, Brasil

Av. Zen lotes 05 e 06
Quadra D
Zen, Rio das Ostras – RJ
CEP 28.890-000, Brasil
T. +55 22 2123 4950
F. +55 22 2123 4951
brasil.sales@sonardyne.com

Singapore, Asia

34 Loyang Crescent
Block B
Singapore
508993
T. +65 6542 1911
F. +65 6542 6937
asia.sales@sonardyne.com

Houston, USA

8280 Willow Place Drive North
Suite 130
Houston, Texas
77070 USA
T. +1 281 890 2120
F. +1 281 890 7047
usa.sales@sonardyne.com

Aberdeen, UK

Units 12–14,
The Technology Centre
Claymore Drive
Bridge of Don, Aberdeen
AB23 8GD UK
T. +44 (0) 1224 707875
F. +44 (0) 1224 707876
sales@sonardyne.com

24/7 Emergency Helpline

T. +44 (0) 01252 877600

Email Support

support@sonardyne.com

Website

www.sonardyne.com