

UM-8300-099

User Manual for 6G Terminal Lite

Issue A Rev 1

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Open source software used with this product is acknowledged in *Appendix A*.

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

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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	vi
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
Section 3 – Technical Description	3
3.1 Introduction	3
Section 4 – Installation	4
4.1 6G Terminal Lite Software Installation	4
Section 5 – Connecting to 6G Equipment	7
5.1 Introduction	7
5.1.1 6G Terminal Lite 6G Setup Tab	7
5.2 Connecting to 6G Equipment	8
Section 6 – Operation	12
6.1 6G Setup	12
6.1.1 Sensors Test	13
6.1.2 Range Test	14
6.1.3 Release Mechanism Test	17
6.1.4 Generating a Report	19
6.2 Noise Measurement	21
6.2.1 Performing Measurements	22
6.3 Scripting Tool	23
6.4 Manual Commands	25
6.5 BootLoader	26
6.6 Admittance Measurement Tool	26
6.7 Bench Test Tool	27
6.8 Pinger Tracking Tool	29
6.8.1 Pinger Tracking Communications Log	31
Section 7 – Firmware Update	32
7.1 Transceiver Firmware Update Procedure	32
Appendix A – Open Source Software Licence Notices and Terms	36
A.1 Open Source Software	36

Figures

Figure 5-1 6G Terminal Lite 6G Setup Tab 7

Figure 6-1 6G Setup Tab 12

Figure 6-2 Example Test Report – Pass 20

Figure 6-3 Example Test Report – FAIL..... 21

Figure 6-4 Noise Tab 21

Figure 6-5 Scripting Tab 23

Figure 6-6 Manual Commands Tab..... 25

Tables

Table 1-1 Related Publications 1

Table 6-1 Script Commands 24

Amendment History

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

Issue	Revision	Date	Comments	Section	Page
A	0	27/06/2014	Initial Issue	All	All
A	1	26/10/2015	Note added for testing in air. General update and figure references removed from numbered procedures.	6.1.2 All	All

Section 1 – Introduction

1.1 Scope of this Manual

This user manual describes the safe installation and operation of the 6G Terminal Lite software. For information on operating and maintaining 6G instruments, refer to the instrument's user manual. 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 the Safety Section in this manual, as well as the warnings, cautions and Safety Section of any additional manuals are read and fully understood.

1.2 Purpose of this Manual

This manual contains information for anyone installing, configuring, and operating Sonardyne's 6G Terminal Lite software.

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>

1.4 Conventions

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

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.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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

Section 3 – Technical Description

3.1 Introduction

6G Terminal Lite is an easy to use setup and diagnostic tool and provides useful terminal functions for all 6G instruments. It displays key information about the 6G asset being interrogated serially, and also allows for setup, diagnostics and testing prior to deployment of the 6G asset.

The other key features of the 6G Terminal Lite are:

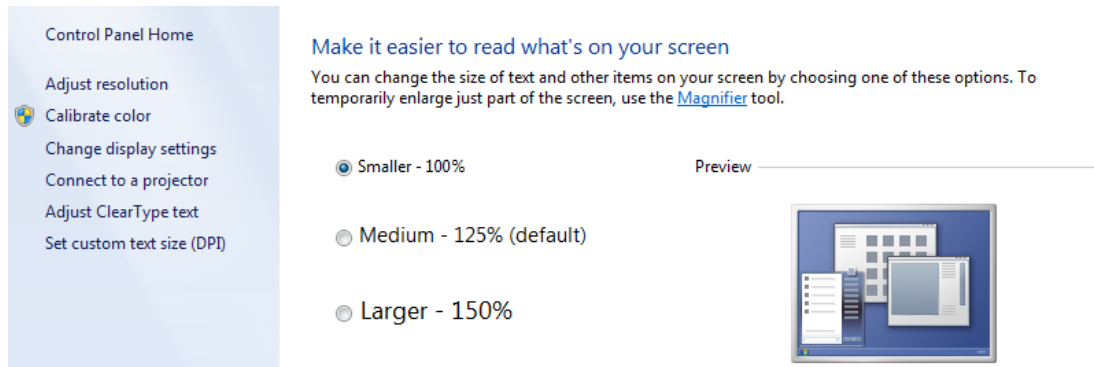
- Test Report Generation.
- Connects through a Navigation Sensor Hub (NSH) to allow communication with HPT based transceivers.
- Download of new firmware – all 6G instruments are supported.
- Simple Pinger Tracking feature for use with USBL transceivers.
- Terminal function for sending manual commands to instruments.
- Noise plot display shows current acoustic noise the instrument is receiving.
- Simple Scripting Tool to allow commands to be repeated periodically or basic conditional tests to be performed.

Section 4 – Installation

4.1 6G Terminal Lite Software Installation

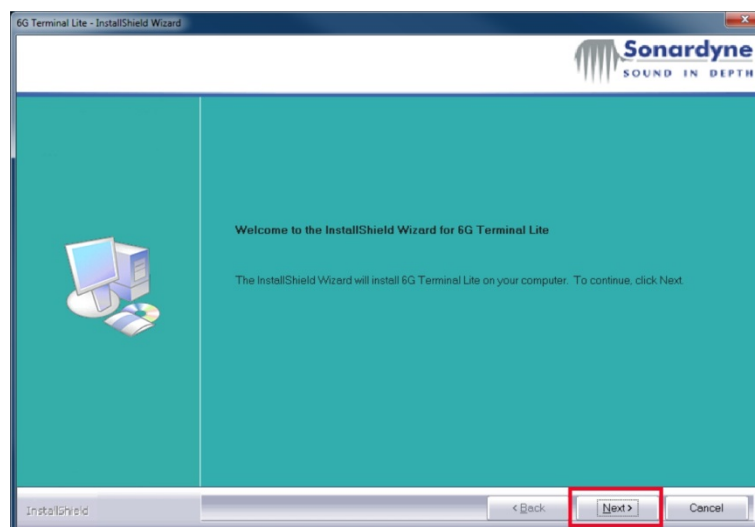
Note

 **6G Terminal Lite is designed to display using an operating system text size of 100%. This can be set as follows: Control Panel > Display > 100%**

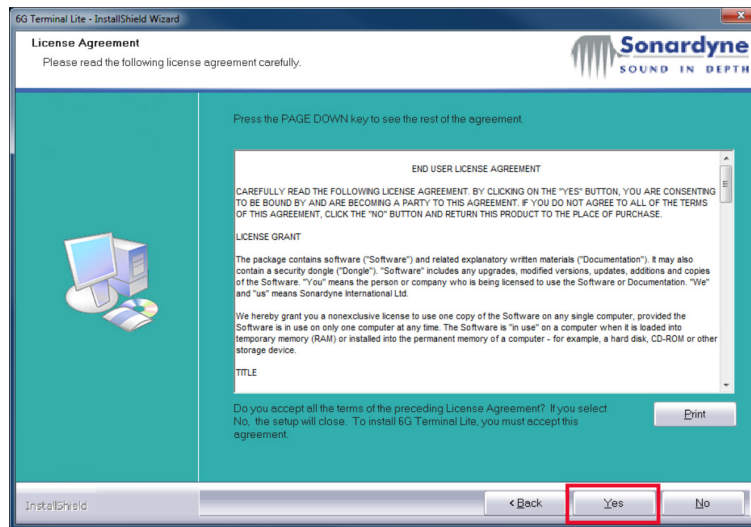


To install the software:

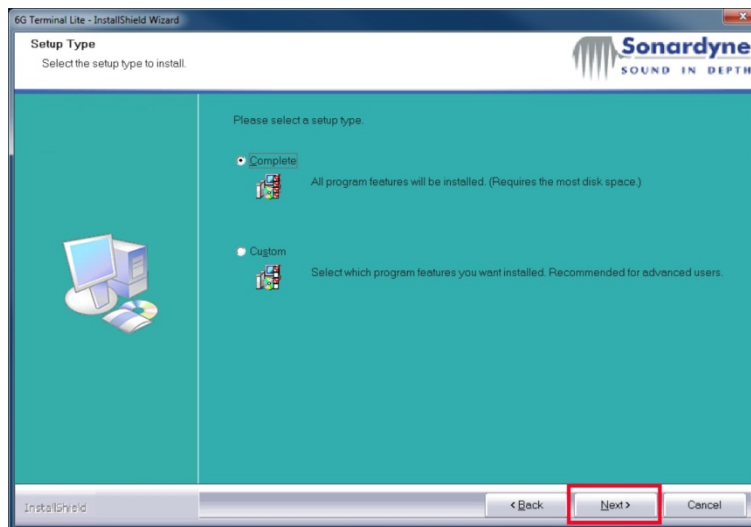
1. Insert the installation DVD into the DVD drive.
2. Navigate to the location of the setup.exe file on the DVD.
3. Double-click **setup.exe**.
4. On the **InstallShield Wizard** window, click **Next** to start the installation.



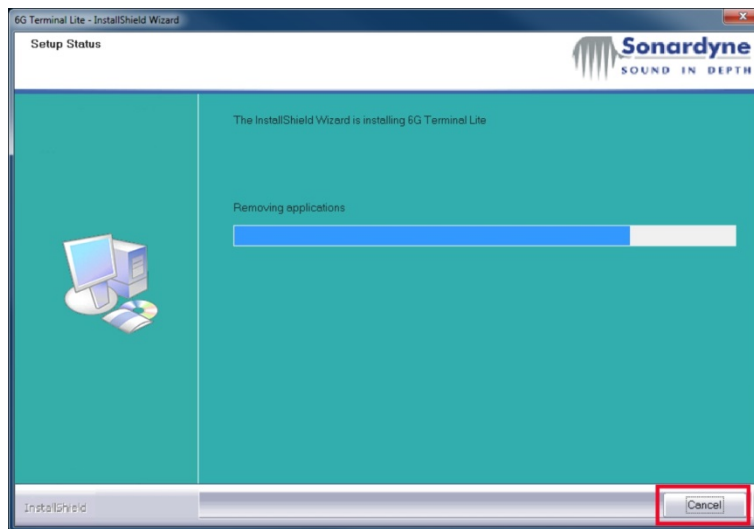
- On the **License Agreement** window, click **Yes** to confirm agreement with the license and to start the installation of the software.



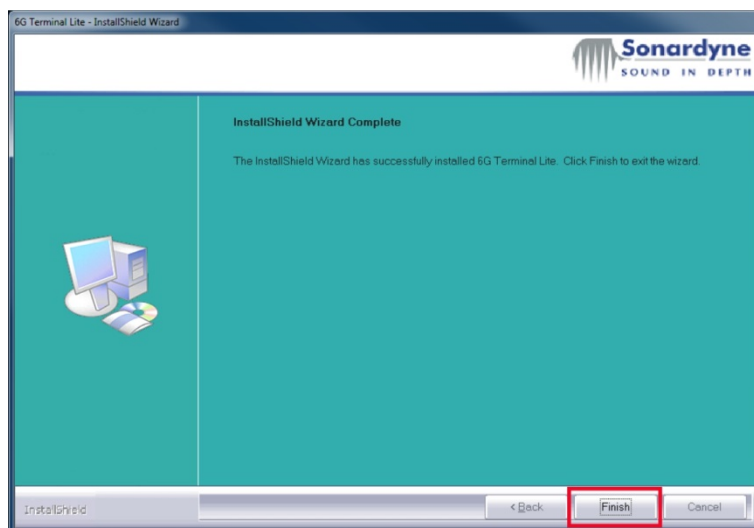
- On the **Setup Type** window it is recommended to select **Complete**.
- Click **Next** to continue with the installation.



8. A progress bar indicates the progress of the installation. Click **Cancel** at any point to stop the installation.



9. After installation is complete, click **Finish** to exit the installation Wizard.



Section 5 – Connecting to 6G Equipment

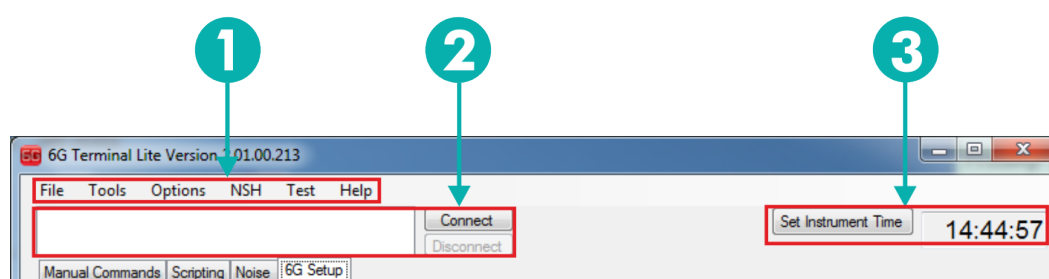
5.1 Introduction

When 6G equipment is connected to a computer installed with 6G Terminal Lite software, the equipment status such as equipment identity, including address, serial number, UID; battery status and any sensors that have been fitted is displayed on the 6G Setup tab.

5.1.1 6G Terminal Lite 6G Setup Tab

Refer to *Figure 5-1*. The 6G Setup tab upper dialog box contains a series of menu options, a connection status window and an option to set the transceiver time.

Figure 5-1 6G Terminal Lite 6G Setup Tab

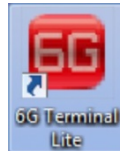


Item	Control	Description
1	Menus	File: Exit the software. Tools: Start the 6G Terminal Tools. Options: 6G Terminal options. NSH: NSH Connect/Disconnect/Auto Connect. Test: HPT Bench Test. Help: About 6G Terminal.
2	Communications	Displays the communication status. Connect: Connect to the communications port. Disconnect: Disconnect from the communications port.
3	Time	Set Instrument Time: Sets the time on the instrument.

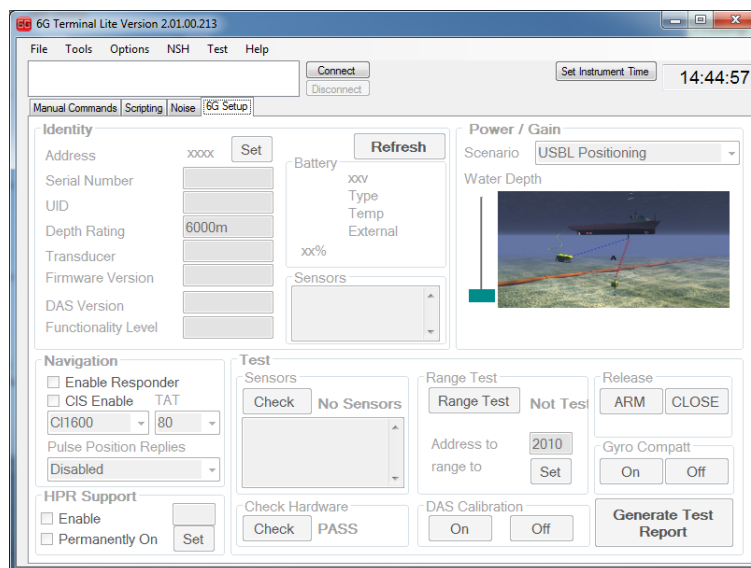
5.2 Connecting to 6G Equipment

Before viewing the equipment status or carrying out any tests, the equipment must first be connected to the 6G Terminal Lite software.

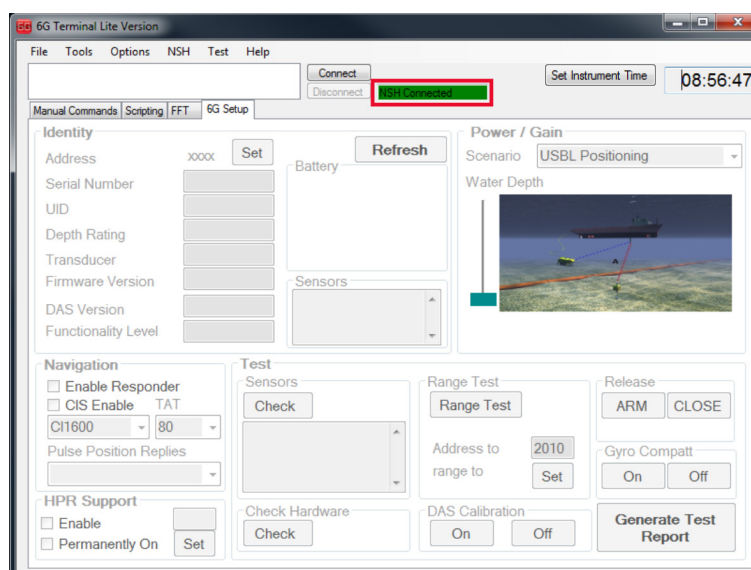
1. Double-click the 6G Terminal Lite desktop icon to start the software.



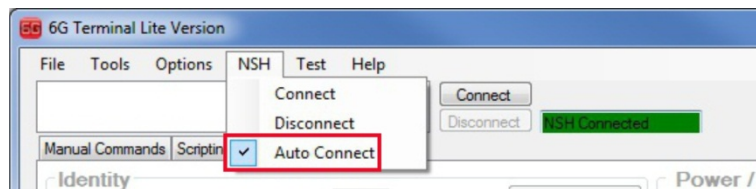
2. The 6G Terminal Lite dialog box will open on the **6G Setup** tab.



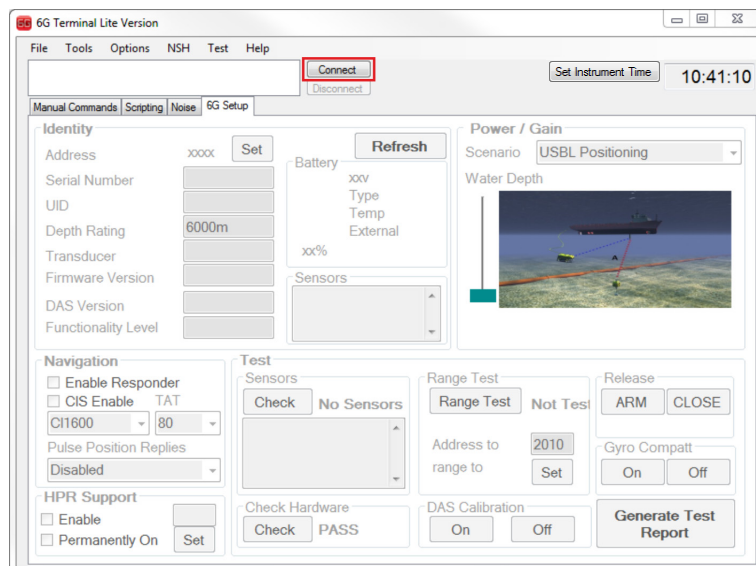
3. If connecting through a NSH follow steps 4 to 7 otherwise go to step 8.
4. The 6G Terminal Lite software should automatically connect to the NSH. Connection will be indicated by **NSH Connected** displayed green.



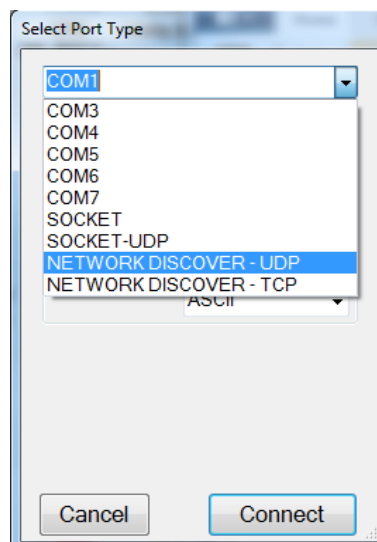
5. If the green **NSH Connection** indication does not appear, the NSH has not automatically connected. If the NSH has not automatically connected follow steps 6 & 7 otherwise go to step 8.
6. To connect to the NSH, click **NSH**, and then check the **Auto Connect** check box.



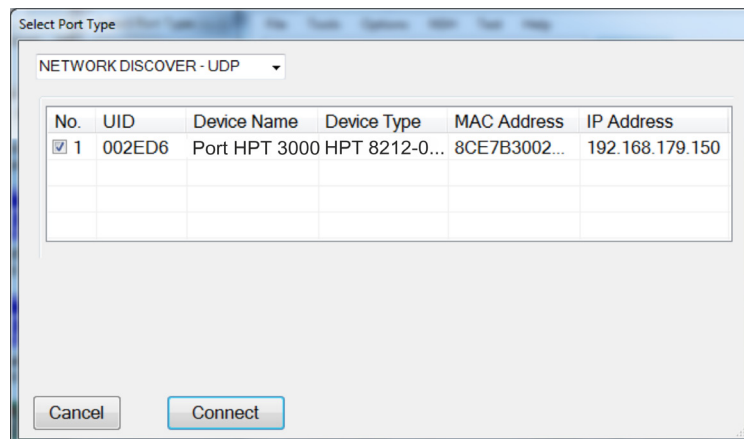
7. Wait until the green **NSH Connected** indication appears (this may take up to 20 seconds). If the **NSH Connected** label does not appear check the NSH connection and confirm it is switched on.
8. Click **Connect**.



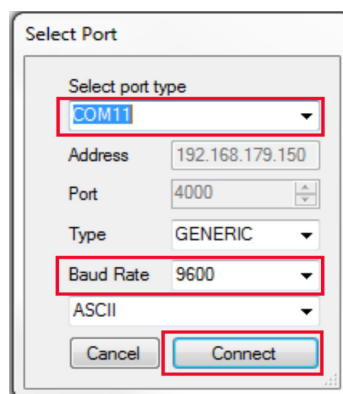
9. If connecting is to an Ethernet based instrument such as the HPT 3000 follow steps 10 to 12 otherwise skip to step 13.
10. On the drop-down list Select **NETWORK DISCOVER – UDP**.



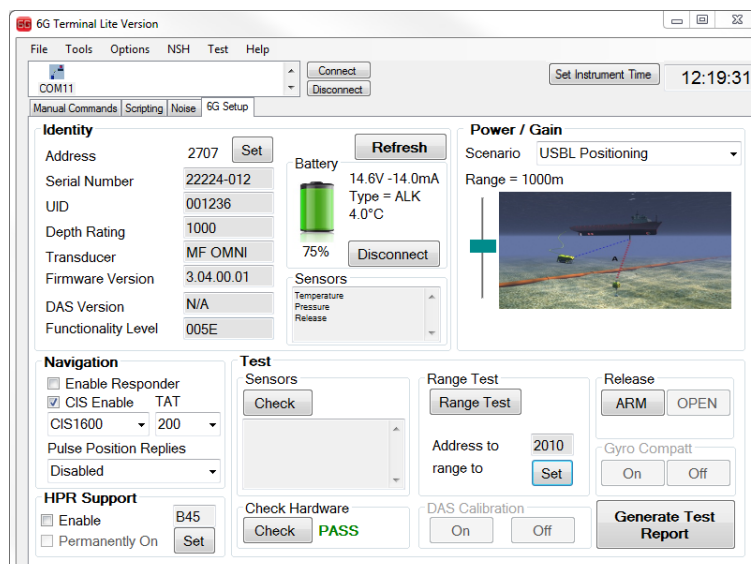
11. The device connected to the Ethernet port will be discovered as shown below:



12. Click **Connect** to connect to the device and skip to step 15. If the device is not shown then ensure the Ethernet socket on the PC being used is set to the same subnet mask. Also ensure firewall settings are not restricting network connection to the device.
13. On the **Select port type** drop-down list, select the computer connection port.
14. On the **Baud Rate** drop-down list select the baud rate and then click **Connect**.



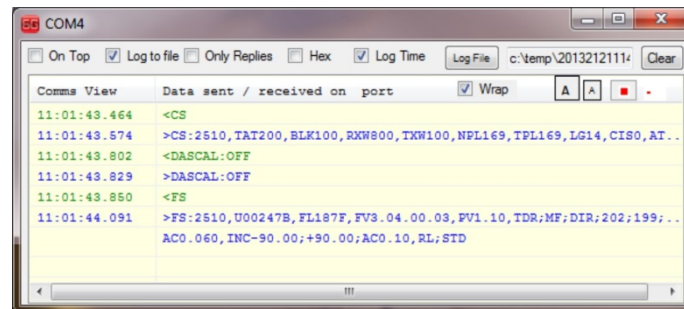
15. The **6G Setup** tab displays information on the connected transponder including address, serial number, depth rating and battery status.



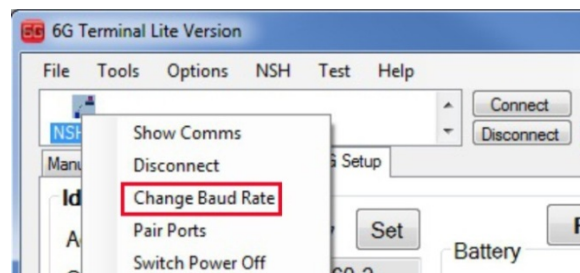
16. A COM log window will also open. The green writing indicates the commands sent from the software to the transponder, the blue writing is the transponders response.

Note

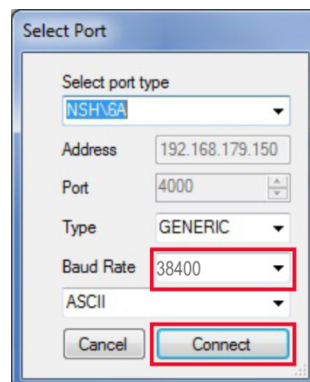
 This window automatically logs all communications when open and should be left open to ensure communications are logged for diagnostic purposes.



17. If the information fails to display it may be because the baud rate is incorrect. Refer to the following figure. Double-click the connection port icon on the 6G Terminal Lite dialog box and select **Change Baud Rate**.



18. On the **Baud Rate** drop-down list select the correct baud rate.



19. Click **Connect** to accept the baud rate and return to the main **6G Terminal Lite** dialog box.
20. Click **Refresh** to get the settings again at the revised baud rate.

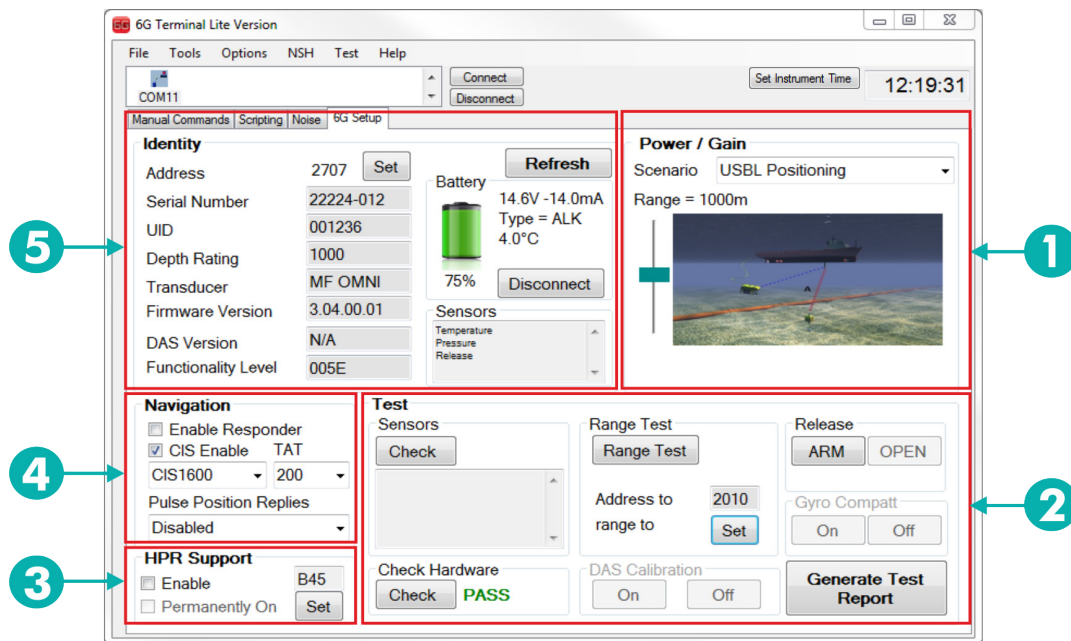
Section 6 – Operation

6.1 6G Setup

The 6G Setup tab is the default display for 6G Terminal Lite and is automatically populated after connection to an instrument or by clicking the refresh button.

The 6G Setup tab displays the currently connected 6G instrument's equipment status and allows test functions to be performed.

Figure 6-1 6G Setup Tab



Item	Control	Description
1	Power/Gain:	Power and gain is setup automatically based on the operation scenario and the range configured here.
2	Test	Sensors (Check): Sensor test. Check Hardware (Check): Hardware test. Range Test: this performs a range check to remote. Release (Arm/Open): Release mechanism test. Set: Opens the Address Selector table. Generate a Test Report: Generate a pdf test report.
3	HPR Support:	HPR is an alternative acoustic channel. Further information can be obtained from the manual for the transponder connected.
4	Navigation	Responder Functionality: Common Interrogate Signal and enabled/disabled status. Turn-around-time. Pulse position replies.
5	Identity	Displays the equipment status such as equipment identity (including address, serial number, UID; battery status and any sensors that have been fitted). Set: Opens the Address Selector table. Refresh: Refreshes all data displayed. Connect/Disconnect: Connects/disconnects the battery.

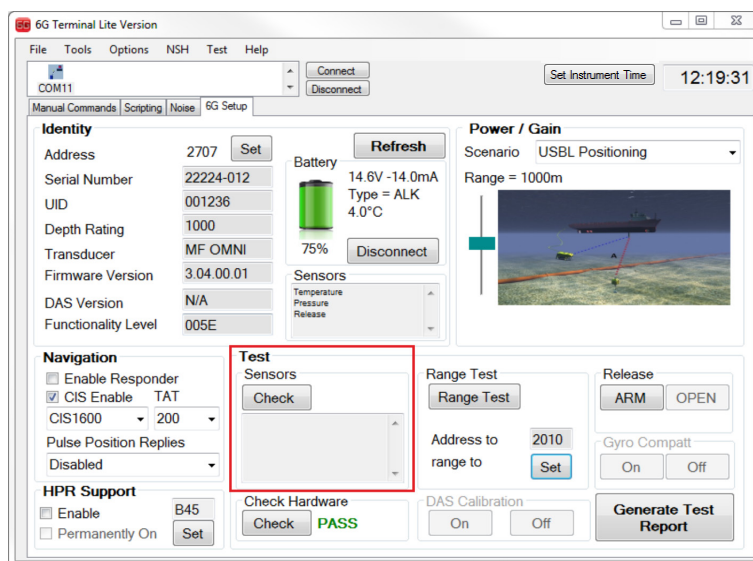
Note

 For further information about the use of each control refer to the associated manual for the transponder/transceiver being setup.

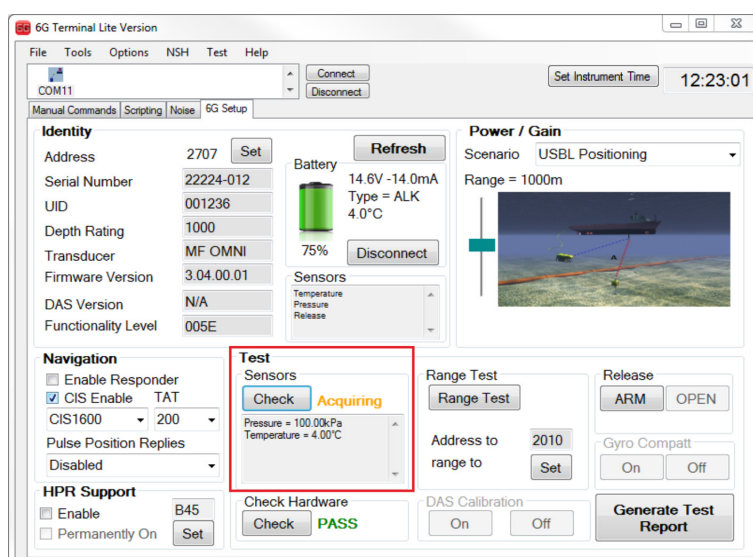
6.1.1 Sensors Test

To perform a sensors test:

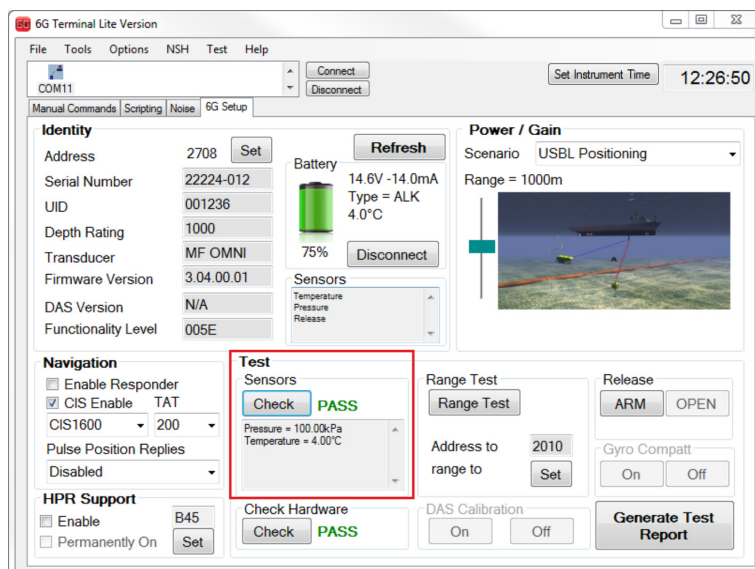
1. On the **6G Setup** tab, click **Test Sensors Check** to perform a test of all sensors installed in the transponder.



2. **Acquiring** appears next to the **Test Sensors Check** button to indicate the test is in operation.



3. **PASS** appears next to the **Test Sensors Check** button to indicate the test is successful. If the test is unsuccessful the word **FAIL** appears.



Note



The inclinometer values refer to the roll then pitch (in degrees).

6.1.2 Range Test

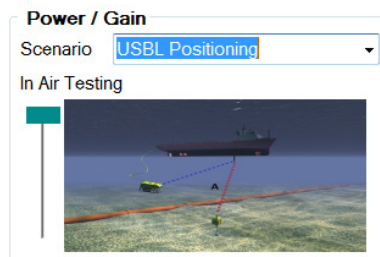
To perform a range test proceed as follows:

Note

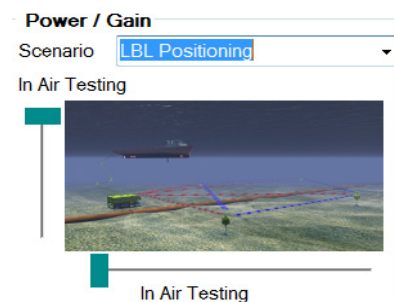


When testing instruments in air, the **Power/Gain** must be set to “In Air Testing” as described below.

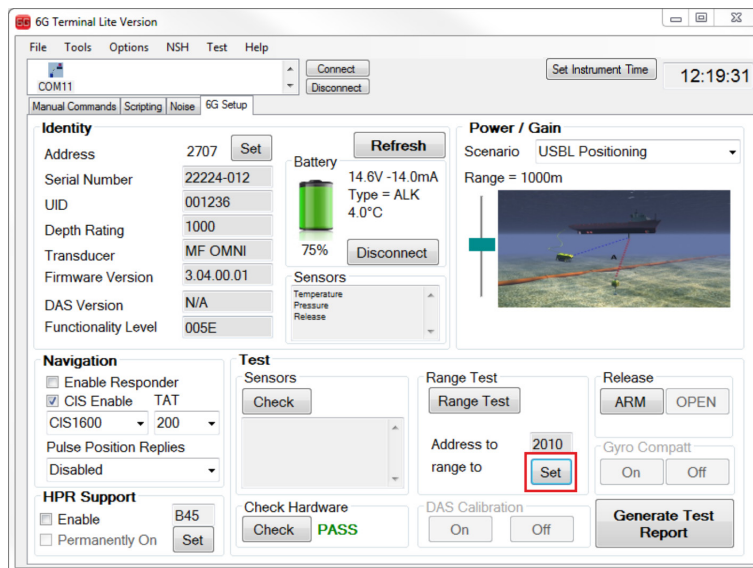
For **USBL Positioning** and **Modem**, slide the **Range** slider to the top position: **In Air Testing** (see below).



For **LBL Positioning**, slide the **Range** slider to the top position and the **Baseline** slider to the left position: **In Air Testing** (see below).



1. On the **6G Setup** tab **Range Test** click **Set**.



2. An Address Selector window opens and shows all available Wideband 2 addresses. Select the **address** for the remote device and then click **OK**.

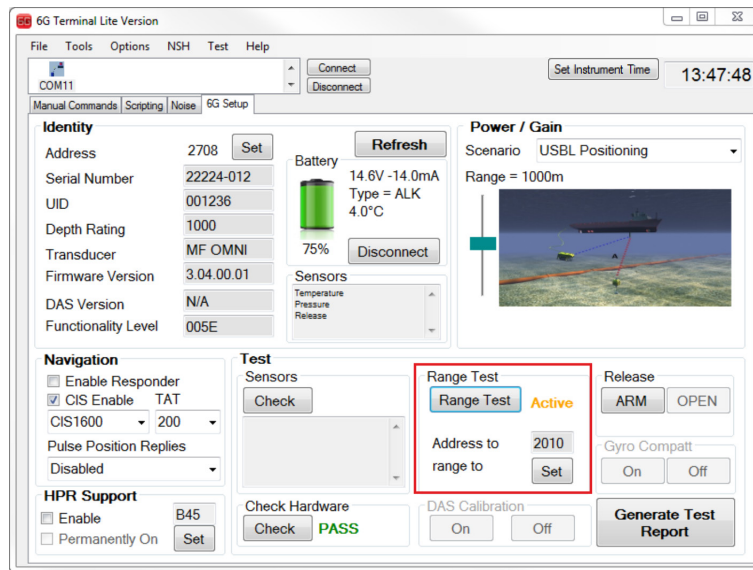
Note



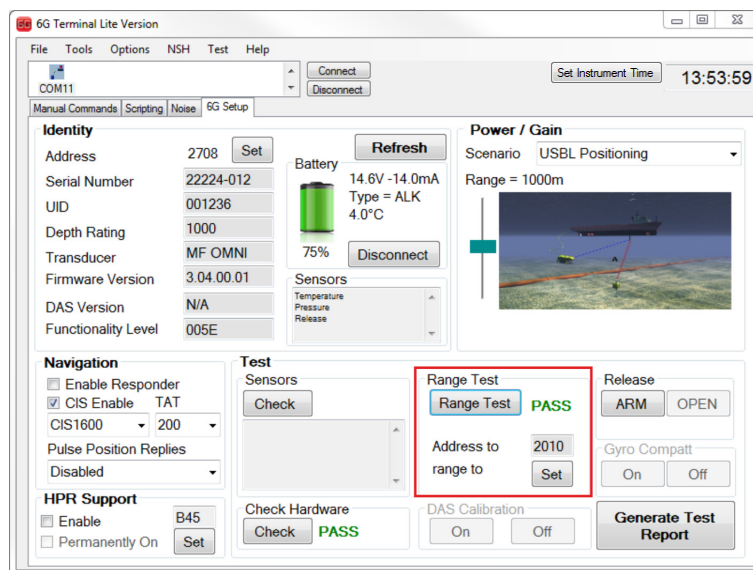
Tabs are also available to show addresses for Wideband 1 and Wideband 2+ systems.



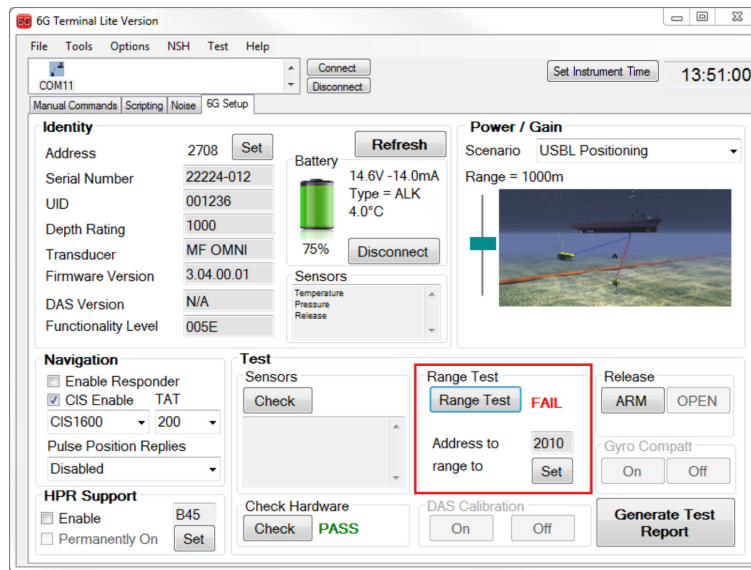
- Click **Range Test** to begin the acoustic check (**Active** appears next to the **Range Test** button to indicate the test is in progress).



- PASS** appears next to the **Range Test** button if the Acoustic check is successful.



5. **FAIL** appears next to the **Range Test** button if the acoustic check is unsuccessful.



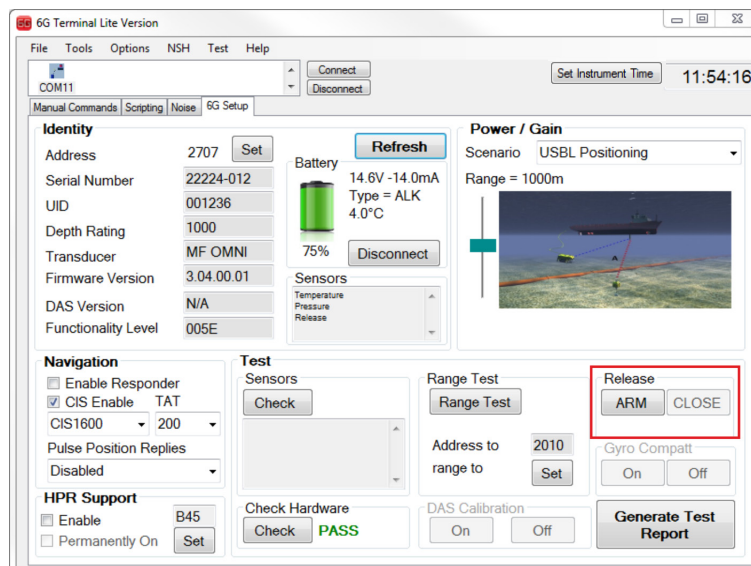
6. The acoustic checks are now complete.

6.1.3 Release Mechanism Test

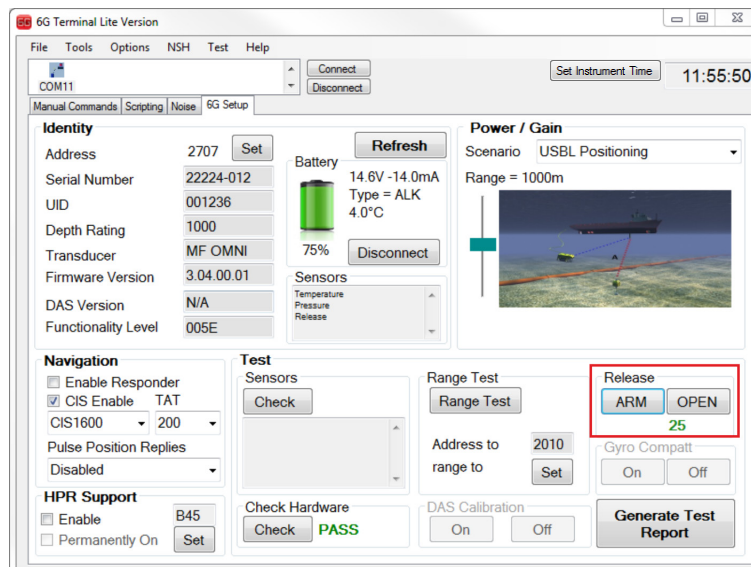
Before installing the equipment, make sure *Section 2 – Safety* is read and fully understood.

To test the release mechanism, proceed as follows:

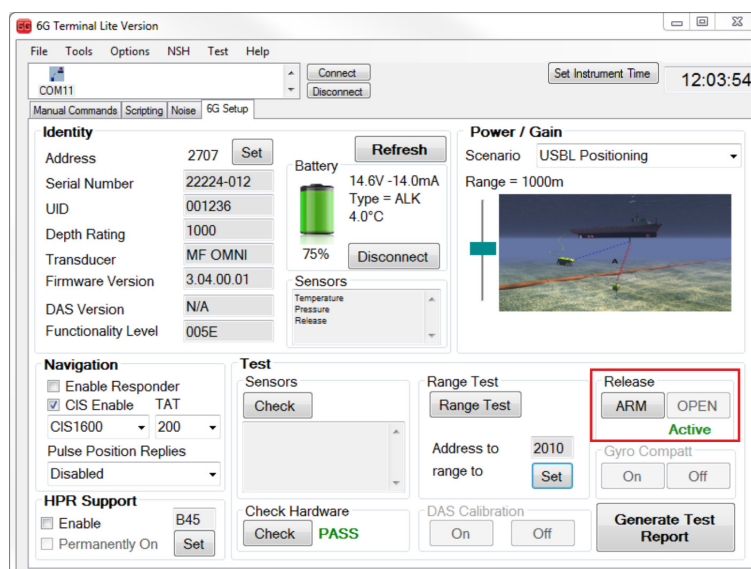
1. On the **6G Setup** tab, the greyed out button to the right of the **Release ARM** button indicates the next position of the release mechanism, for example, if the release mechanism is currently open the button shows **CLOSE**.



- To operate the release mechanism click **ARM**. The **OPEN/CLOSE** button will become active and a 30-second countdown timer will start counting down.



- Click the **OPEN** or **CLOSE** button before the 30-second countdown ends.



- After the **OPEN/CLOSE** button has been selected, it will return to a greyed out status and **Active** will appear to indicate the mechanism is moving.
- When the release mechanism movement has completed the **OPEN/CLOSE** button indicates the next position of the release mechanism.

Note



If the unit has a screw release, a popup window will request to open or close the release as this can not be determined by the software.

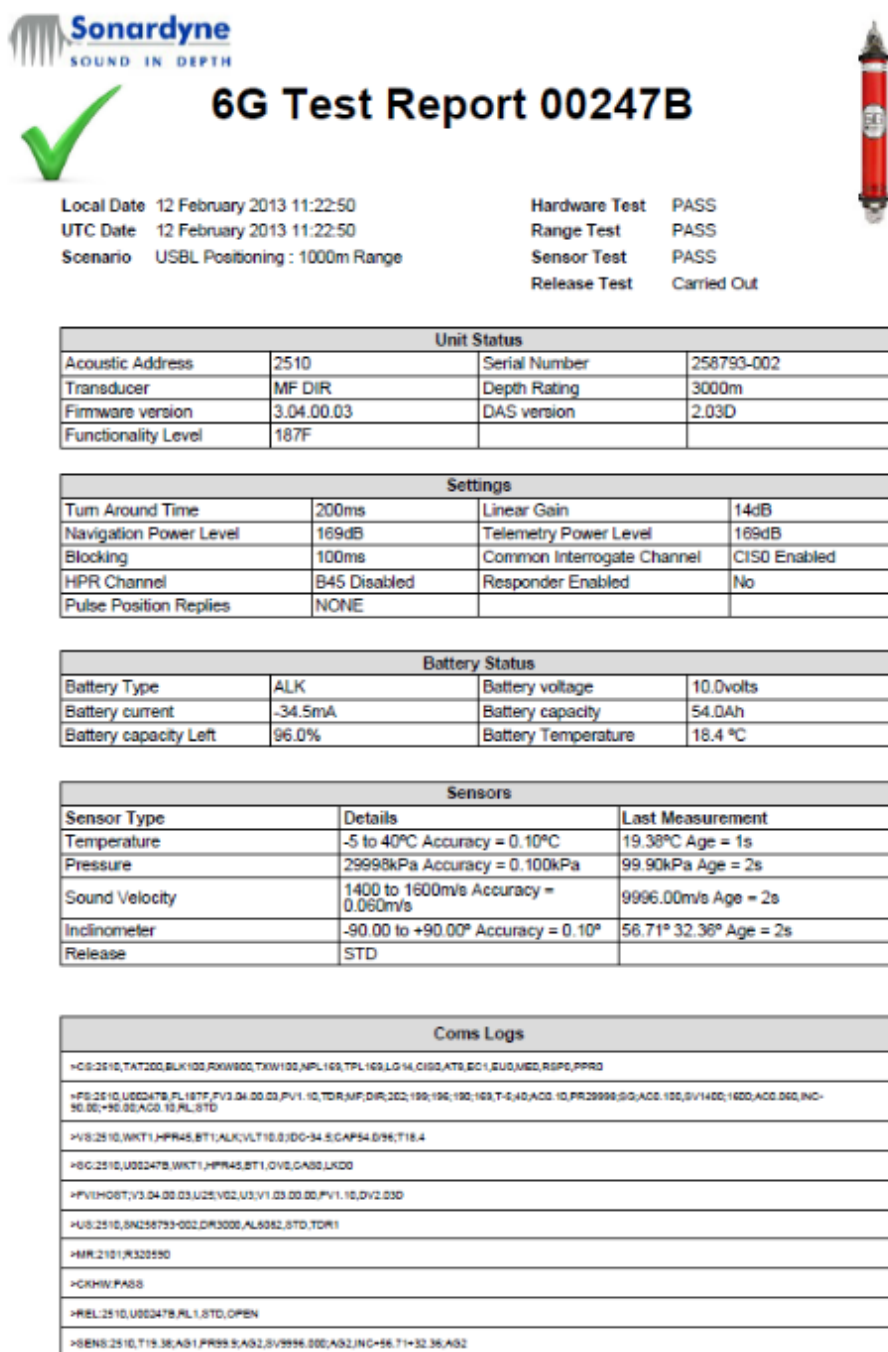
6.1.4 Generating a Report

A test report can be generated by clicking **Generate Test Report**. The test report contains the following data:

- Test Report Title
- Date/Scenario
- Hardware/Range/Sensor/Release Tests, confirmation of which tests were performed and the end results; PASS/FAIL
- Unit Status
- Settings
- Battery Status
- Hardware Identification
- Comms

An example of a generated test report with PASS and FAIL status is shown below.

Figure 6-2 Example Test Report – Pass

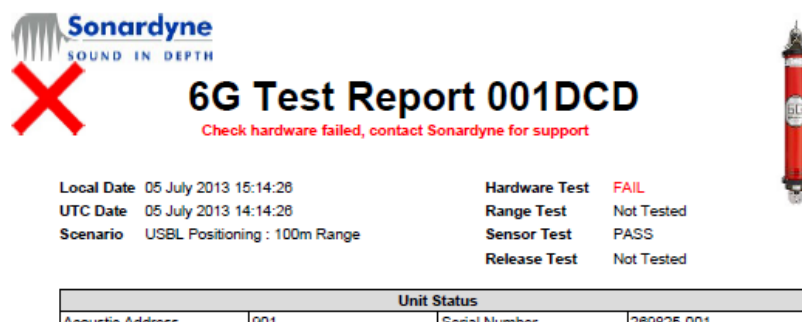


12 February 2013 11:22:50

1 of 1

6G Terminal Transponder Report

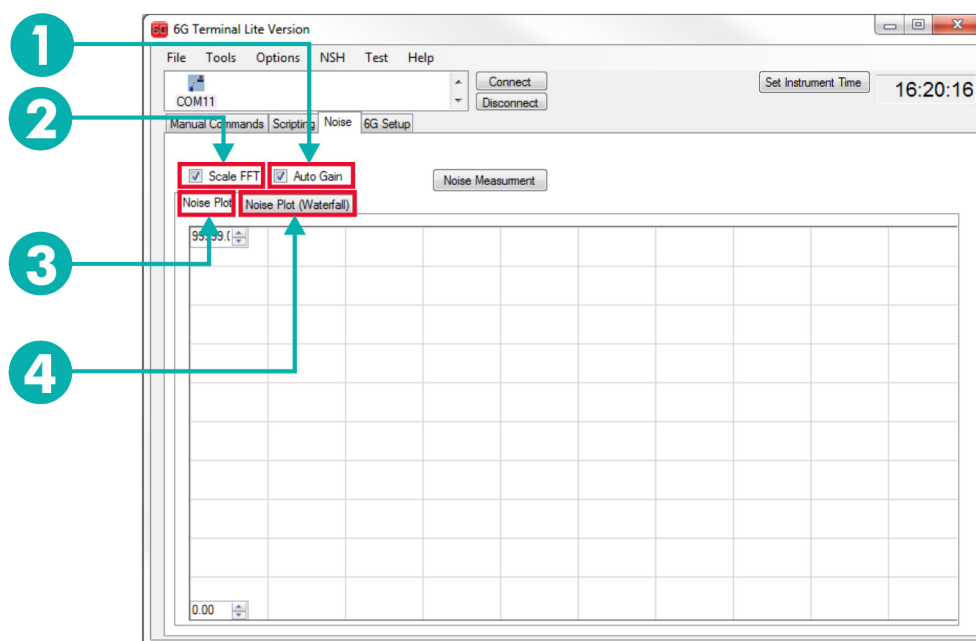
Figure 6-3 Example Test Report – FAIL



6.2 Noise Measurement

Select the **Noise** tab to measure the amount of noise being received by the 6G instrument.

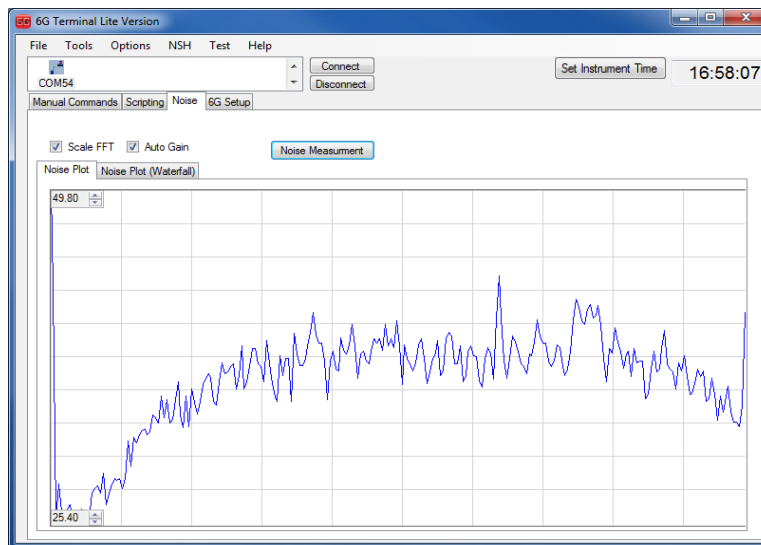
Figure 6-4 Noise Tab



Item	Control	Description
1	Auto Gain	This optimises the gain for a noise measurement. If unchecked, the currently set gain value is used.
2	Scale FFT	This scales the noise measurement according to the internal calibration on the device. All noise measurement is displayed as a spectral noise level in dB's (this implies a dB per 1 Hz).
3	Noise Plot Tab	This plot displays the noise level where the x axis is frequency from 0 to 62.5kHz and the y axis is the magnitude of the noise in dB.
4	Noise Plot (Waterfall) Tab	This plot displays noise where the x axis is time, y axis is frequency and the intensity of the colour indicates the amount of noise.

6.2.1 Performing Measurements

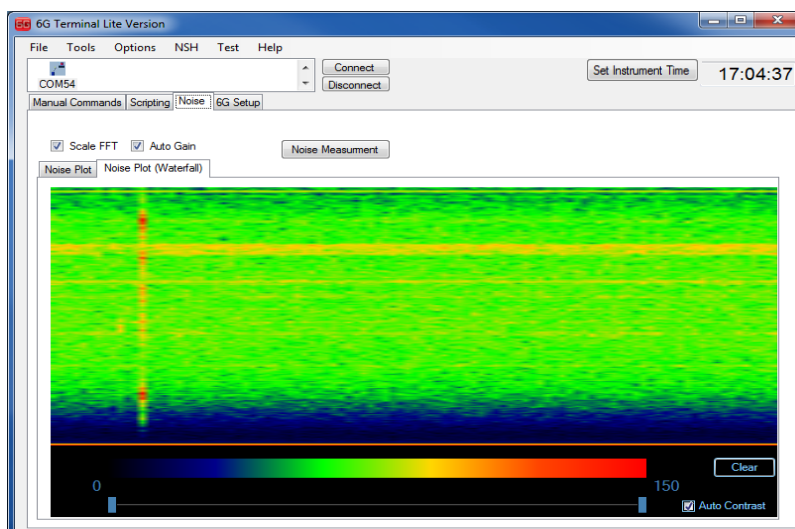
To take a noise measurement click **Noise Measurement**. The result will be displayed as shown in below.



An alternative method is to use the **Scripting Tool** on 6G Terminal Lite to take continuous measurements. Using this method the waterfall plot can be used to display how the noise is varying over time.

To use this method:

1. Enter the following text into the **Scripting Tool** (refer to *Section 6.3*):
FFT:A16,N256,F0,SN,GAINA
WAITFORREPLY5
2. Click start script.
3. While the script runs the results can be viewed on the **Noise Plot (Waterfall)** tab as shown below.



Note



The speed of the noise update is governed by the baud rate set on the unit.

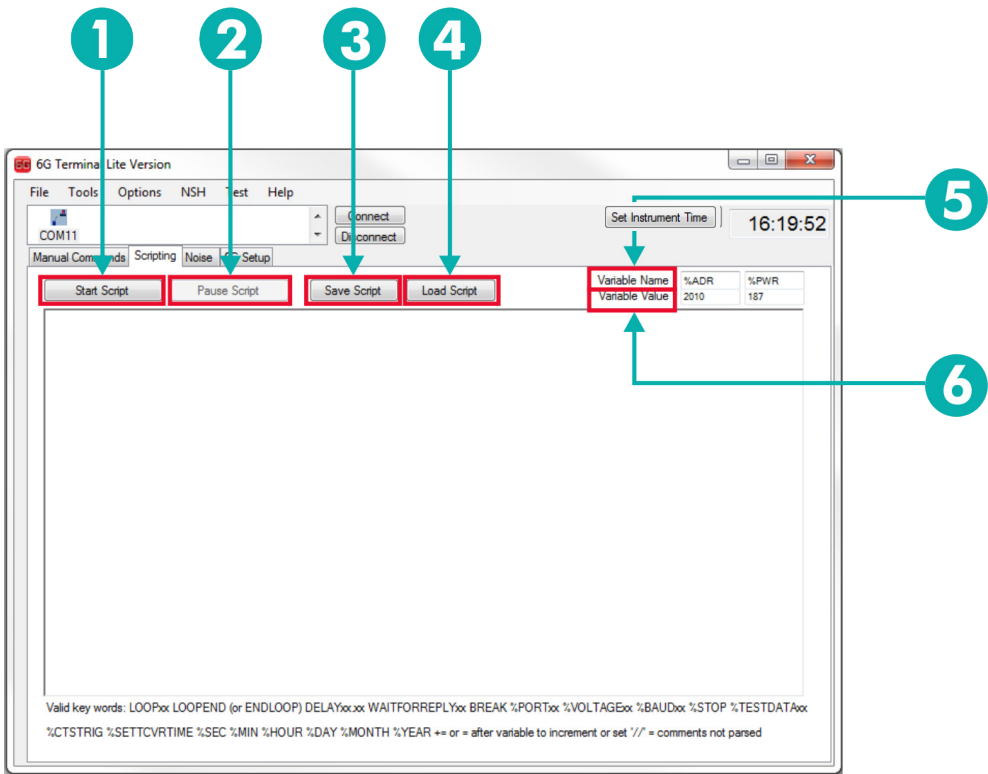
6.3 Scripting Tool

Select the Scripting tab to perform a sequence of commands that can be sent via 6G Terminal Lite using the Scripting Tool.

Note

 The script will loop continuously until stopped by the user.

Figure 6-5 Scripting Tab



Item	Control	Description
1	Start Script	Start or stop the script.
2	Pause Script	Pause the script.
3	Save Script	Save the script to file.
4	Load Script	Load a script file.
5	Variable Name	Any occurrence of this name within the script is replaced with the associated variable value.
6	Variable Value	The associated variable value to match the variable name.

A script is made up of two types of text; either key words recognised by 6G Terminal Lite or user text which is sent on the connected port. Script commands are shown in *Table 6-1*.

Note

 User text must not use keywords.

Table 6-1 Script Commands

Key Word	Description
LOOPx	This indicates the start of an internal loop, the loop (until the ENDLOOP or LOOPEND keyword) will be actioned x times, for example LOOP10 will action a loop 10 times.
LOOPEND or ENDLOOP	Indicates the end of a loop.
DELAYxx.xx	This instructs 6G Terminal Lite to delay for this period of time in seconds.
WAITFORREPLYxx	This instructs 6G Terminal Lite to wait for a reply on any port, the parameter xx is a time out in case no reply is received.
BREAK	Sends a serial break is sent to the instrument.
%PORTxx	The current port is changed, ports are defined as 1,2,3,4 in the order they were connected to and does not use the physical port name.
%VOLTAGExx	This is only valid for a NSH port connection and sets the voltage on that port to either 0 or 48 volts. The command supports two options, 0 or 48.
%BAUDxx	Changes the baud rate on the port to the value specified.
%STOP	Stops the script.
%TESTDATAxx	Sends xx bytes of test data to the port, data is numeric from 0 to 9.
%TESTDATAASCIIxx	Sends xx bytes of test data to the port, data is ASCII from a to j.
%SETTCVRTIME	Sends the current 6G Terminal Lite time to the transceiver.
%SEC, %MIN, %HOUR, %DAY, %YEAR, %MONTH	Replaces these strings with the current values as read by 6G Terminal Lite.
%VAR +=	This is an operator used to manipulate variables, ie %VAR+=10 will increment the variable by 10.
%VAR =	Used to set a variable value to a constant.

An example script to send noise measurements every 5 seconds followed by a collection of sensor data every second 5 times is shown below:

```

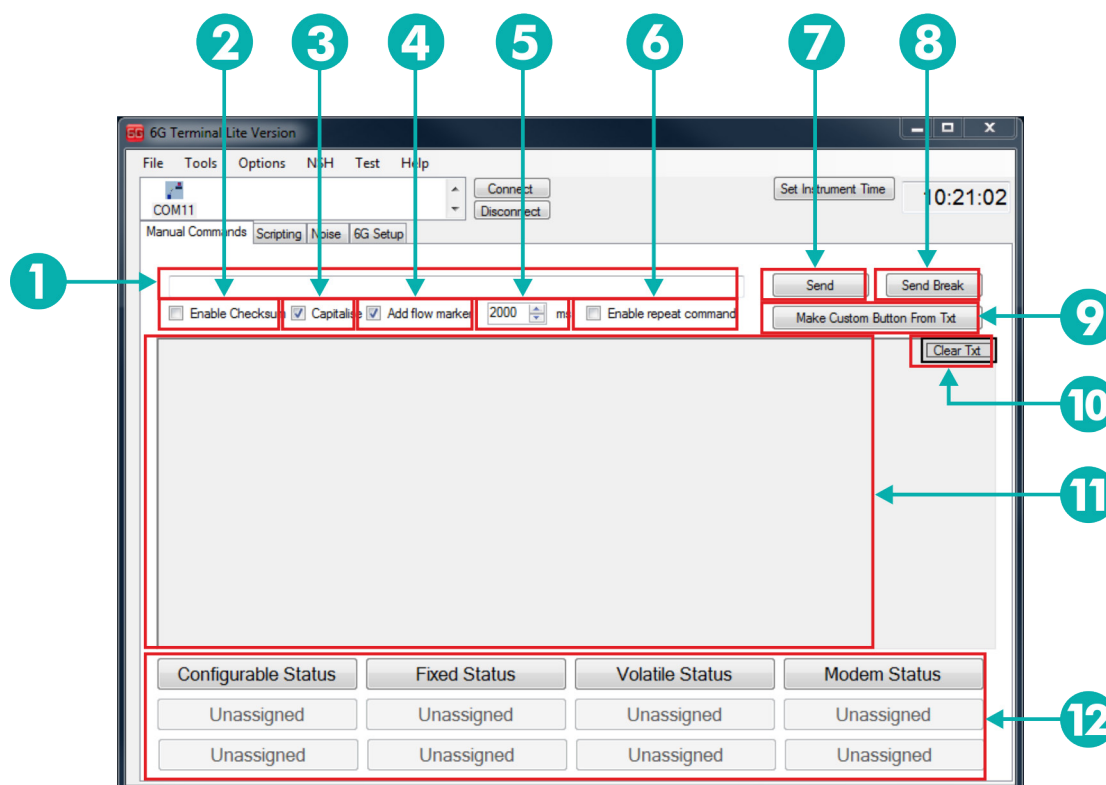
FFT:A16,N256,F0,SN,GAINA
WAITFORREPLY5
LOOP5
SENS
DELAY1
ENDLOOP

```

6.4 Manual Commands

Select the **Manual Commands** tab to send commands directly to the instrument or serial port connected. Commands typed in box **1** will be sent to the communications port connected when the **Send** button **7** is clicked.

Figure 6-6 Manual Commands Tab



Item	Control	Description
1	Text entry	Text to be sent.
2	Enable checksum	Check to enable for instrumetns that support checksum.
3	Capitalise	Check to CAPITALISE. Set Instrument Time
4	Add flow marker	Check to add the flow marker (6G protocol) to all commands.
5	Repeat timer value	Enter the repeat timer value in ms.
6	Enable repeat command	Check to simulate the Send button at the rate specified in 5 .
7	Send	Click to send the text to the selected port.
8	Send Break	Click to send a serial break to the selected port.
9	Make Custom Button from Txt	Click to add the text in 1 to one of the custom buttons 12 . The next button clicked will take on the identity of the text.
10	Clear Txt	Click to clear the text display 11 .
11	Text display	Shows text sent and recevied by 6G Terminal
12	Custom buttons	Can be customised to send a specific command (see item 9).

6.5 BootLoader

The Bootloader application allows firmware in 6G instruments to be updated. Refer to *Section 7 – Firmware Update* for details on Bootloader.

6.6 Admittance Measurement Tool

The Admittance Measurement tool allows HPT USBL arrays to be checked. All HPT variants including Gyro USBL can be checked in this way.

Note



This is run as part of the HPT Bench test which is the preferred way of running the tool.

The admittance test tool will run internal checks to analyse the USBL array. The data is used for support purposes and is not detailed within this manual.

To perform a calibration using the Admittance Measurement Tool:

1. Click **Tools > Admittance** to start the Admittance Measurement Tool.
2. Leave all settings as default and click **Calibrate**.

The screenshot shows the 'Admittance Measurement Tool' window. At the top, there is a 'Calibrate' button highlighted with a red rectangle. Below it is a dropdown menu showing 'HPT Test (Type 8142)'. Under the 'Results' tab, there are input fields for 'Serial No.', 'Build Date', and 'Type'. To the right, there are input fields for 'Gain Factor', 'Gain Variation', 'Loss Factor Error', 'Freq Gain Factor', 'Timing Factor', and 'Temperature'. At the bottom, there are two tables: 'As Built Data' and 'Current Measurements'. Both tables have columns for 'Element', 'Loss Factor', 'Capacitance', and 'Frequency'.

- Results will be automatically populated.

The screenshot shows the 'Admittance Measurement Tool' window. It includes a 'Calibrate' button, a dropdown menu for 'HPT Test (Type 8142)', and a 'Results' section. The results section displays fields for Serial No. (250312-004), Build Date (13/12/07), and Type (8021-002-C2). It also shows Gain Factor (2.163e-08), Gain Variation (875), Loss Factor Error (0.000500), Freq Gain Factor (5.070e-07), Timing Factor (2.244), and Temperature (22.1). Below these are two tables: 'As Built Data' and 'Current Measurements', both showing Element, Loss Factor, Capacitance, and Frequency.

Element	Loss Factor	Capacitance	Frequency
A	4.200E-003	438.20 pF	54240 Hz
B	4.400E-003	435.70 pF	54360 Hz
C	4.200E-003	436.10 pF	54360 Hz
D	4.500E-003	434.20 pF	53700 Hz
E	4.100E-003	431.40 pF	54000 Hz

Element	Loss Factor	Capacitance	Frequency
A	9.100E-003	442.00 pF	54180 Hz
B	9.900E-003	438.90 pF	54120 Hz
C	9.800E-003	439.80 pF	54120 Hz
D	9.800E-003	438.00 pF	53640 Hz
E	9.600E-003	434.80 pF	53760 Hz

- The results can be saved to file.

6.7 Bench Test Tool

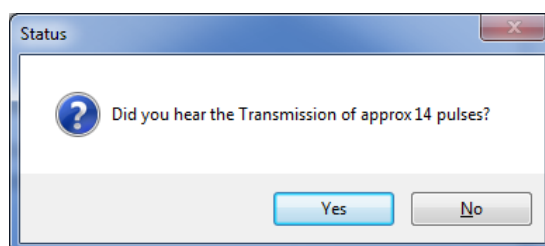
The HPT User Manual (*UM-8142*) suggests periodic checks on the instrument. The Bench Test Tool should be used to perform these checks. All HPT variants are supported including Gyro USBLs.

To perform a Bench Test:

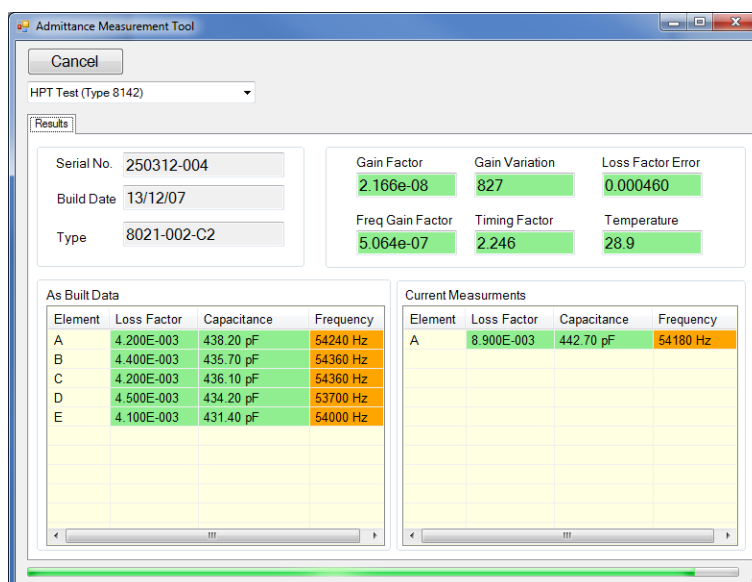
- Click **Test > Bench Test** to start the HPT Bench Test Tool.
- Click **Get Serial Number From HPT** to retrieve the serial number from the unit to be tested.

The screenshot shows the 'HPT Bench and Tank Test' window. It includes fields for Serial Number, User, Drawing Number, and Revision. There are buttons for 'Get Serial Number From HPT', 'Update MPDB', and 'Test Procedure'. The 'Bench Test' tab is selected, showing 'Perform Test', 'Create results .pdf', and 'Test Coms with HPT'. The 'Power supplies' section shows readings for 20V, 48V, and 55V. The 'Test 1' section shows UID, Firmware Version, FPGA Version, Acoustic Address, Admittance data retrieved from EEPROM, Receiver Boards, A, B, Array Diameter, I2C operation, Ethernet Address, and Power Supplies. The 'Test 2' section shows Tx Operation. The 'Test 3' section shows Loopback calibration. The 'Test 4' section shows Inclinator. The 'Test 5' section shows Admittance Test.

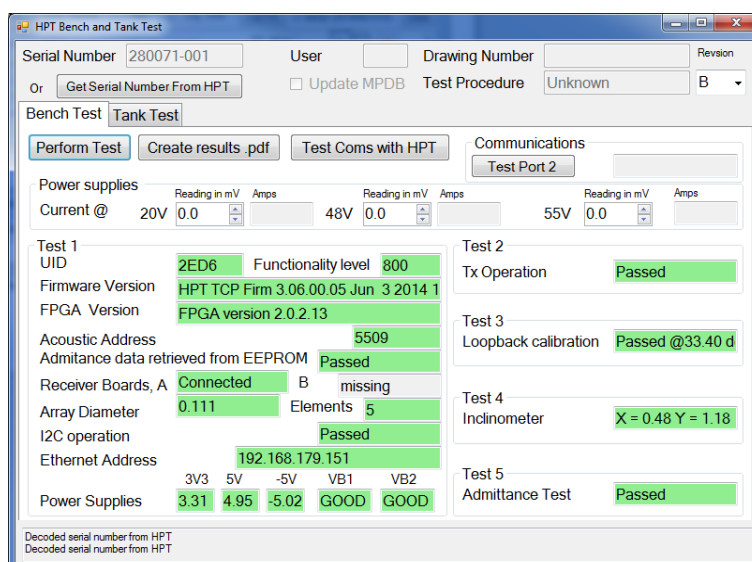
3. Click **Perform Test** to run a bench test.
4. During the test a window will open to confirm if you can hear the transmissions from the unit. This is possible in air by holding your hand against the middle of the array. If the transmission is heard, click **Yes**. If this is not possible, skip the test by clicking **No**.



5. Continue with the test by following the dialogs.
6. The Admittance tool will run until completion of the test.



7. After completion of the test close the **Admittance Measurement Tool** dialog box. A confirmation box will ask whether the test passed, click **Yes** unless any boxes are coloured red.



- Any failures during the test will be indicated by red boxes, otherwise the test passed. Please contact Sonardyne Support for assistance if any failures are observed.

Note



Only the results that are shown in green above will be valid, other tests require specialist equipment to perform.

6.8 Ping Tracking Tool

The Ping Tracking Tool provides a means to track Pingers such as those found in aircraft black box recorders.

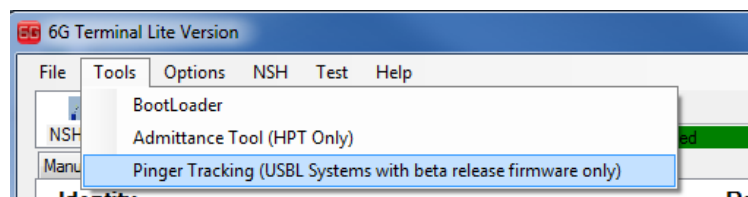
Note



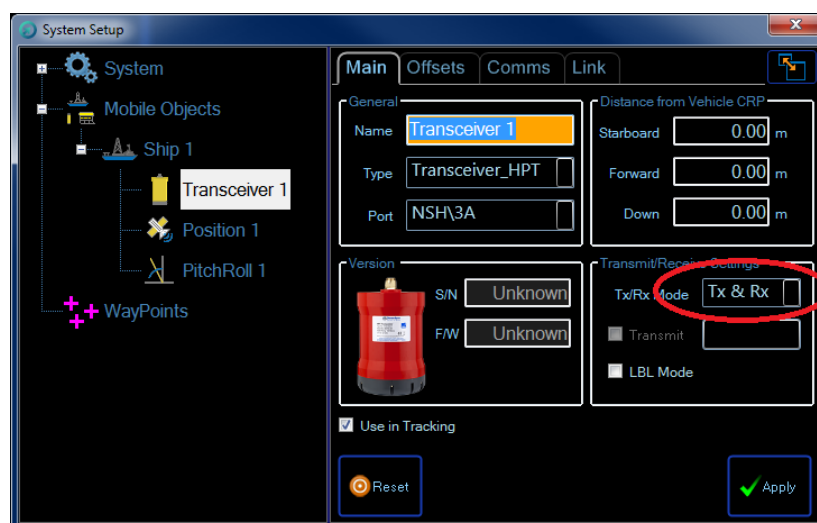
Ranger2 must be running as it provides authentication for the HPT based instrument which 6G Terminal does not support for security reasons.

To perform Ping Tracking:

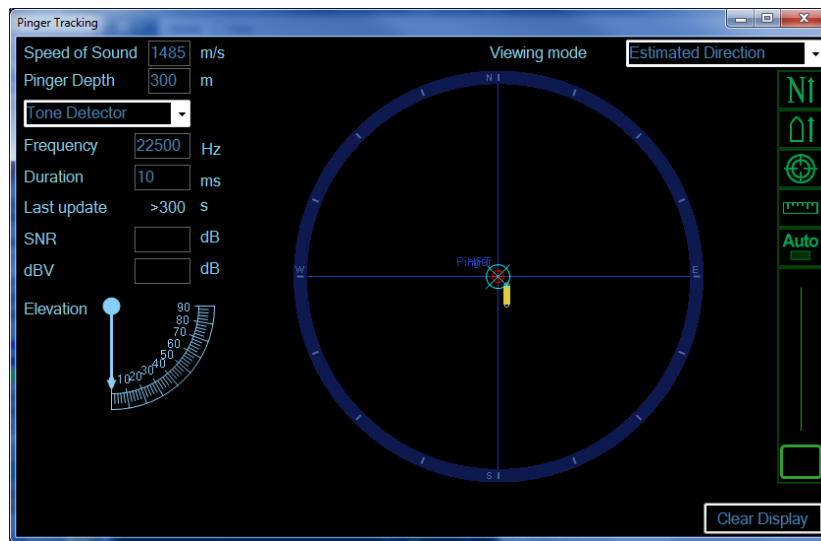
- Click **Tools > Ping Tracking...** to start the Ping Tracking Tool.



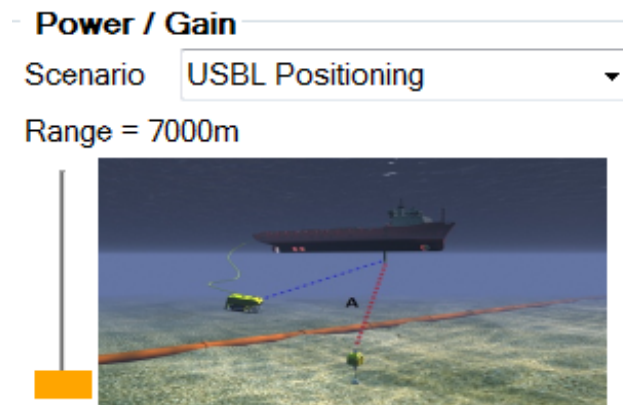
- The HPT must be disabled in the Ranger 2 software.
- Start the Ranger 2 software and leave the 6G Terminal Lite software open.
- In Ranger 2 click **System > Setup** and navigate to the transceiver in the job tree of the **System Setup** window.
- Set the Tx/Rx Mode to Disable.



6. The Pinger Tracking Tool will now be displayed. Set the pinger frequency in the **Frequency** box between **10000** and **60000** Hz (aircraft flight recorders normally use 37500 Hz).



7. Once a signal is detected, the chart will automatically show the pinger's direction and elevation relative to the HPT.
8. If the depth has been entered, the viewing mode can be changed to **Estimated Position** to give a predicted position relative to the HPT. It is advisable to click **Clear display** after this change.
9. If no pinger is detected the system can be set to its highest sensitivity. On the 6G Terminal Lite screen select the **6G Setup** tab and change the **Power/Gain Range** slider to the maximum depth of **7000 m** (this will change the HPT's gain to maximum – this is the only setting that will affect the Pinger Tracking functionality).

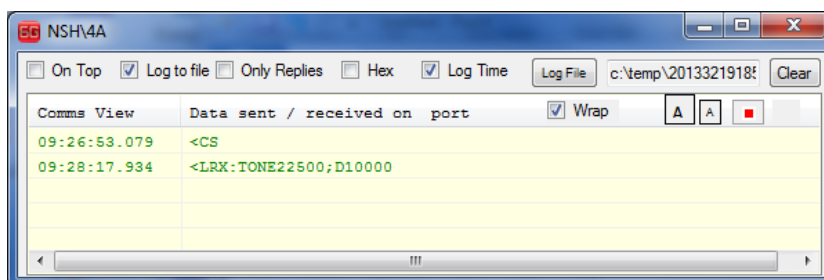


10. Revert back to the Pinger Tracking Tool. If there is still no pinger detected, check the correct frequency has been entered into the Pinger Tracking Tool.

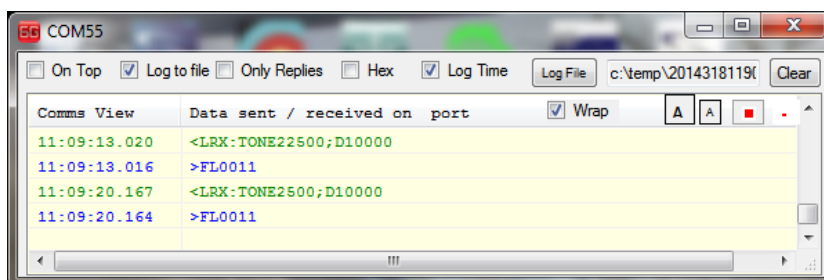
6.8.1 Pinger Tracking Communications Log

If the Pinger Tracking is not successful, the communications log can be sent to Sonardyne support for analysis. The communications log can be obtained as follows:

1. Untick the **Log to file** check box and then send the recorded file to Sonardyne support for analysis. The file can be found in the directory **c:\temp**.



2. If the response shown in blue reads **FL0011** or similar, there may be an authentication error and the transceiver must be set to the correct TX/RX mode.



3. Close and restart Ranger 2 software and repeat from Step 4 in *Section 6.8*.

Section 7 – Firmware Update

The 6G Terminal Lite software can be used to update any 6G instruments primary firmware, but does not include upgrading DAS firmware on the Compatt 6. The following sections describe the procedure for updating firmware.

7.1 Transceiver Firmware Update Procedure

Before updating the firmware, make sure the following is available:

- The new firmware file
- A 6G Terminal Lite software installation

To update the firmware:

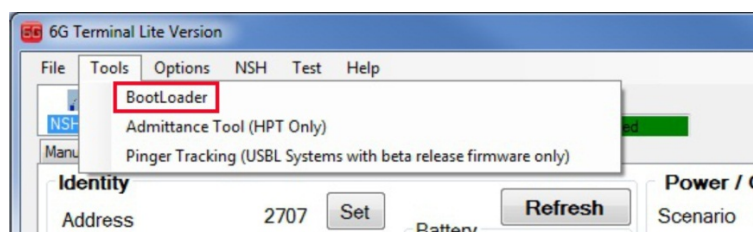
1. Connect to the port the instrument is connected to as described in Section 5 – Connecting.
2. A communications window will open displaying all communications between the transceiver and the NSH. The transceiver NSH COM port is displayed at the top of the window. This window can be left open.

Notes

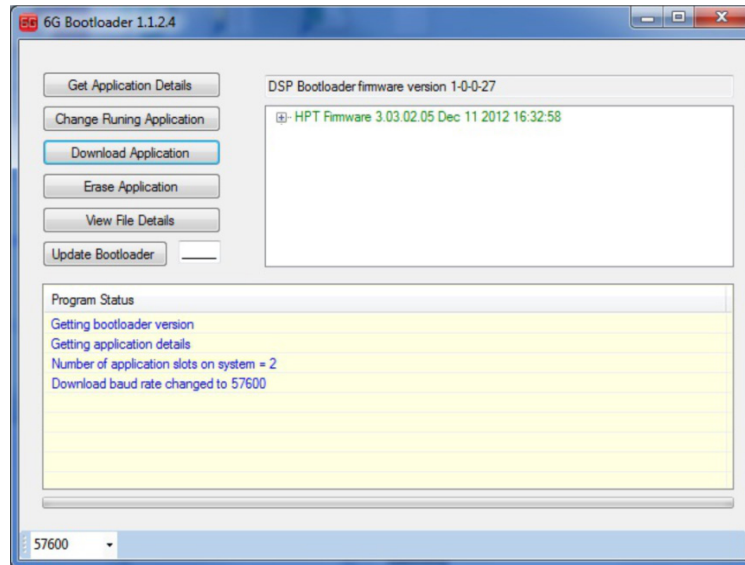
 If using Ethernet device discovery (e.g when connecting to HPT 3000) and the unit cannot be discovered, the instrument cannot be upgraded until the connection issue is resolved

 If communications do not appear in this window, the 6G bootloader can still be started (see following step).

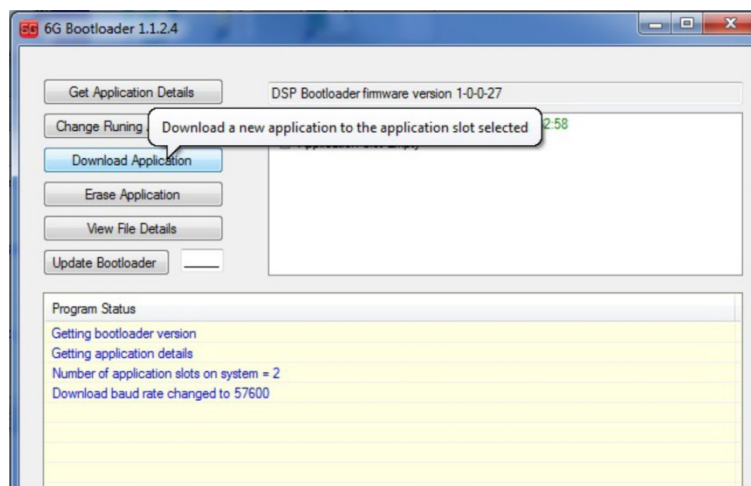
3. Start **6G Bootloader** to update the firmware. In the **6G Terminal Lite** dialog box, click **Tools > Bootloader**.



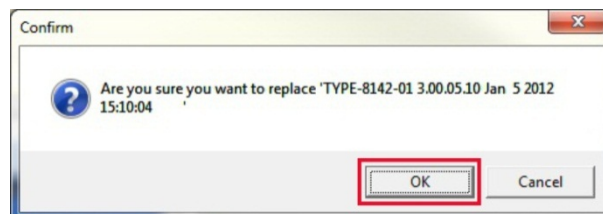
4. The **6G Bootloader** window displays the current firmware installed in the transceiver.



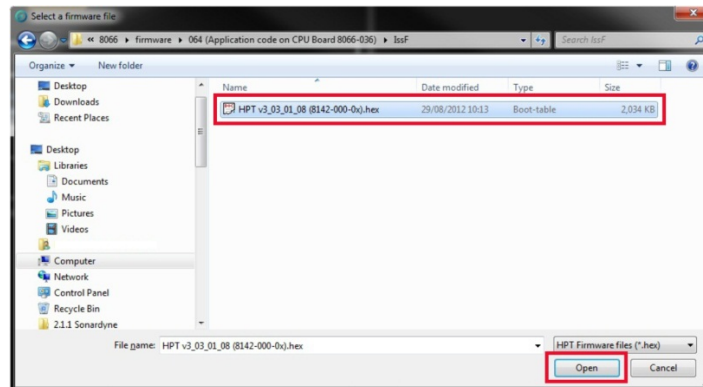
5. Click the **Download Application** button.



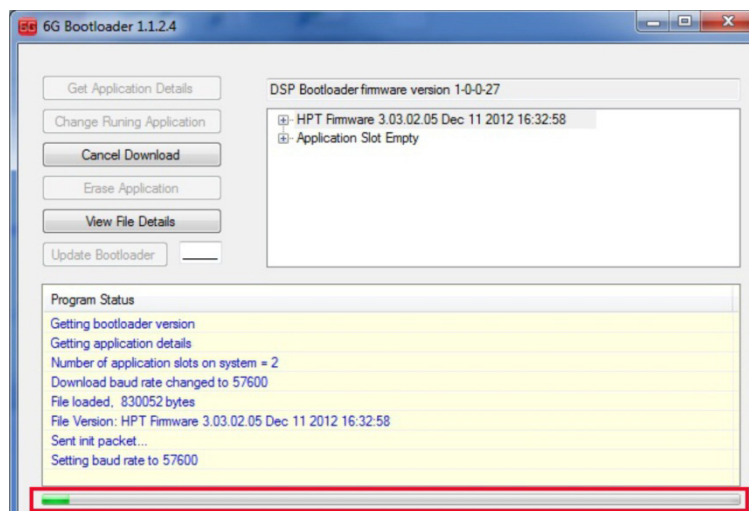
6. A warning dialog box will appear to confirm that the firmware will be replaced. To proceed, click **OK**.



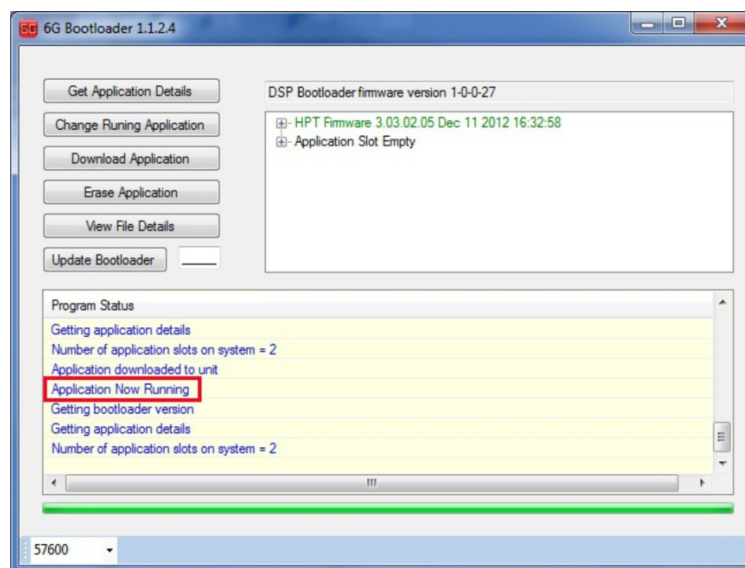
7. On the **Select a firmware file** dialog box, navigate to the location of the new firmware.



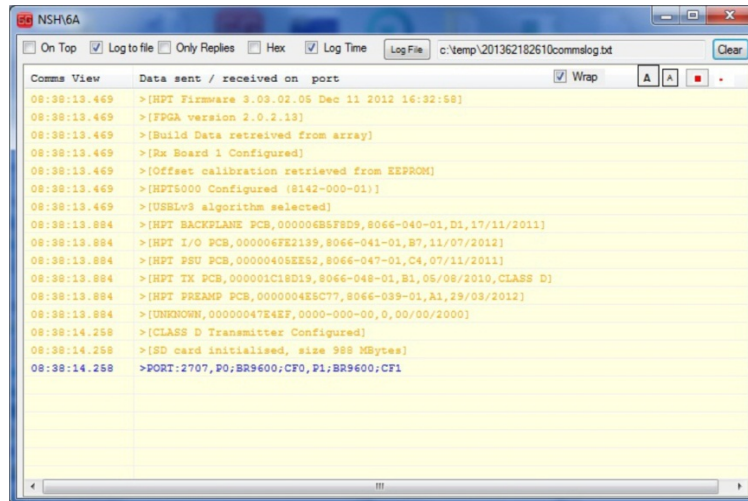
8. Select the new firmware version and then click **Open**. The **Select a firmware file** dialog box will close.
9. The **6G Bootloader** dialog box shows the progress of the firmware installation.



10. The firmware installation will be complete when the progress bar is completely green and **Application Now Running** appears in the **Progress Status** list.



11. Close the **6G Bootloader** dialog box and return to the **6G Terminal Lite** dialog box.
12. After a short pause, communication between the transceiver and the NSH will begin. This can be viewed in the communications window.



13. Communication indicates the firmware upload has been successful.

Appendix A – Open Source Software Licence Notices and Terms

The following open source software is used with this product.

A.1 Open Source Software

A.1.1 Gios PDF library

© 2005 Paolo Gios

This software application makes use of the Gios PDF Library, which is distributed in accordance with the GNU LESSER GENERAL PUBLIC LICENSE version 3.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

A.1.2 PTPd V1.0

This application makes use of PTPd software.

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Definitions

Term	Definition
6G [®]	Sonardyne's sixth generation technology hardware platform.
ANT	Acoustic Navigation Tester.
CIF	Common Interrogation Frequency.
COMPATT	COMPUting and Telemetry Transponder (see Acoustic Intelligent Transponder).
Common Reply Signal (CRS)	A reply signal common to a complete family of addressed transponders.
CPU	Central Processing Unit.
CRF	Common Reply Frequency.
DAS	A micro-controlled data acquisition and logging sub-assembly located within a transponder.
Data Fusion Engine (DFE)	Acts as the system controller, generates the display signals for the monitor, processes the data from the transceiver for the display to the operator and output to a DP system and talks to various "attitude" sensors and other navigation systems.
Delay between commands	Provides a delay between adjacent commands.
Depth Status	The transponder can be fitted with an optional depth sensor to send depth information at each interrogation.
Differential Global Positioning System (DGPS)	A 24 hour, world-wide radio navigation system. GPS receivers track and decode the data from satellites and calculate the position and speed of a vehicle.
Dynamic Positioning reference (DP Reference)	Several position inputs e.g. GPS receivers, taut wire sensors, LBL, SBL or USBL acoustic positioning sensors, wind speed indicators etc.
Dynamic Positioning System (DPS)	Automatically maintains a vessel with a constant heading, and in a fixed position without an anchor and provides more flexibility in operation.
Dynamic Positioning telegram (DP Telegram)	The report an acoustic positioning system sends to a DP system over a serial interface.
Digital Signal Processing (DSP)	The representation of signals by a sequence of numbers or symbols and the processing of these signals. DSP includes subfields like: audio and speech signal processing, sonar and radar signal processing, sensor array processing.
Firmware	The firmware installed on the transponder. Firmware upgrades can be installed via WSM Terminal. The Tx firmware refers to the transmission signal synthesiser.
HPR	Hydro-acoustic Position Reference.
HPT	High Performance Transceiver.
Long Base Line Positioning System (LBL)	A system where two or more transponders are on the seabed. The positions of the transponders are established by a calibration process in a seabed frame. The distances from a transducer to each transponder are measured using a transceiver. The position of the transducer can be computed in the seabed frame. The name comes from the "baselines" joining each transponder.
LUSBL	Long and Ultra Short Base-Line.

Term	Definition
PSU	Power Supply Unit.
Serial Communications Wait	The maximum time allowed for the Transponder to reply to an RS232 command.
Sonardyne	Sonardyne International Limited and its affiliates.
Sonardyne Wideband®2	6G® transponders and transceivers use Sonardyne Wideband® 2 which has 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.
Ultra Short Base Line Positioning System (USBL)	A system similar to an SBL system except the system uses three or more elements in a single transducer array. The measurements it makes are the differences in “time-phase” of the signals from each element. The co-ordinate frame is fixed to the transducer array which must be oriented in the vessel frame to be equivalent to the SBL.

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