

Operation Guide

Ranger 2 V6.04

System Configuration

 **Sonardyne**
SOUND IN DEPTH





Ranger2 USBL

Version 6

Options

AUV Tracking	Backdrops
Extended Range	LUSBL / DP-INS
MRAMS	✓ Multi-AHRS
Multi-User	Riser Profiling
Robotics	✓ USBL

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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 and the equipment manual(s) 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.

PRODUCT SUPPORT: Email: support@sonardyne.com Telephone: +44 1252 872288

24 Hour Emergency Helpline: +44 1252 877600

The Sonardyne 24-hour helpline is answered during normal UK office hours: 08:00–17:00. Outside these hours, your call is automatically transferred to an operator who will log the details of your emergency and alert the appropriate Sonardyne personnel. Our aim is to ensure that emergency requests are dealt with immediately during office hours and are responded to within 30 minutes at all other times. Alternatively, please contact your nearest Sonardyne Office.

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To view third party and open-source software licence notices for Mini-Ranger 2, see *UM-8251 "Ranger 2 USBL User Manual"*.

Contents

This Quick Start Operation Guide (QSG) describes the basic installation and configuration of Ranger 2 in the following steps:

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- *Adding a Heading Device*
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Related Publications

For more information on Ranger 2, refer to the following user manuals:

- *UM-8251 "Ranger 2 User Manual"* (included with Ranger 2)
- *UM-8026-MC "User Manual for User Manual for Marine Computer"* (supplied with the Marine Computer)
- *UM-8098 "User Manual for the Navigation Sensor Hub"* (supplied with the NSH)
- *UM-8142 "User Manual for the HPT"* (supplied with the HPT)
- *UM-7950 "User Manual for the Through-Hull Transceiver Deployment Machine"*

Product Support Videos

Visit the Sonardyne YouTube channel for additional advice on using Ranger 2.

Ranger 2 System Equipment

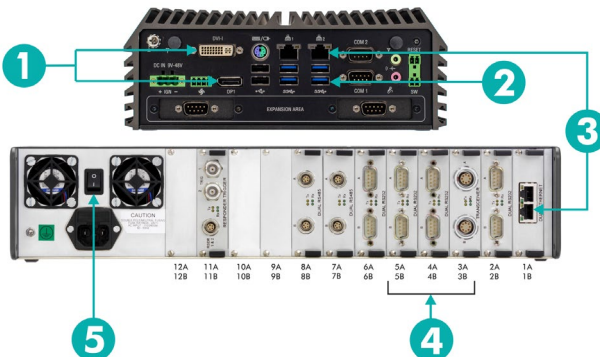
The main components of a typical Ranger 2 system consist of:

Marine Computer (shelf mounted)	
NSH	
HPT	
Peripheral cables for connecting Marine Computer to NSH and NSH to HPT (not shown)	

Connecting the Marine Computer (MC) and NSH

Follow the instructions below to connect the equipment.

1. Connect appropriate power cables to the rear of the NSH and MC.
2. Connect a monitor(s) to the MC using the DVI-I and/or display port **1**.
3. Insert the security dongle (if required) into a rear USB socket on the MC **2**.
4. Connect the MC to the NSH using an Ethernet cable **3**.
5. Connect the HPT transceiver to the NSH port (3, 4 or 5) **4**.
6. Turn on the MC by pressing the power button on the front panel of the shelf-mounted chassis (not shown below).
7. Turn on the NSH by pressing the power button on the front panel (not shown below) – ensure the rear power switch **5** is on.

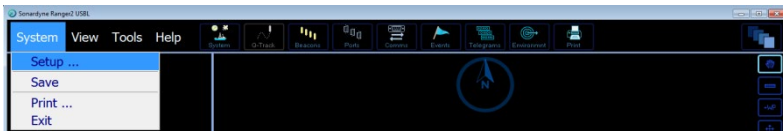


Introduction

This Guide explains how to set up the Ranger 2 system. For detailed information refer to the *Ranger 2 USBL User Manual (UM-8251)*.

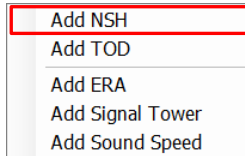
Starting Ranger 2

1. Start the Ranger 2 software by double-clicking the **Ranger 2** icon.
2. On the main menu, click **System > Setup** to open the **System Setup** window.

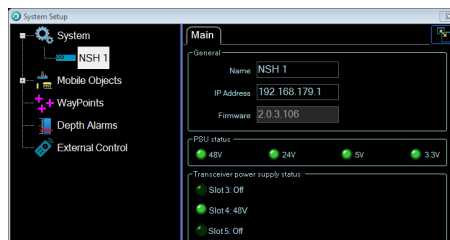


Adding an NSH

1. In **System Setup**, right-click **System** and select **Add NSH**.



2. After connection, the NSH IP address and firmware version will be displayed.



3. When connected, the green status LED will display in the bottom panel.



Note

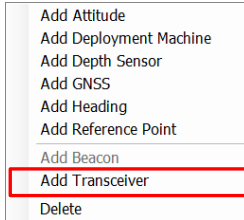


The following steps describe how to add devices by right-clicking the **Vessel** or **Mobile Objects**. Devices and beacons can also be added by clicking **Ports** or **Beacons** and then clicking **Add**.

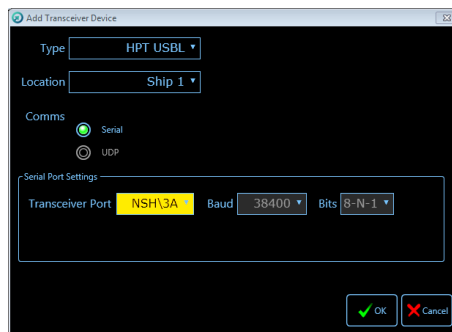
Adding a Transceiver

Adding a Transceiver

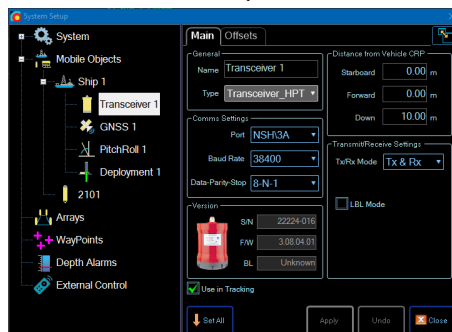
1. In **System Setup**, click **Mobile Objects**.
2. Right-click the vessel (**Ship 1**) and select **Add Transceiver**.



3. In the **Type** box, select the transceiver from the drop-down list, e.g. **HPT USBL**.
4. Select the NSH port from the **Transceiver Port** drop-down list (select ports 3–5) and then click **OK**.



5. The Serial Number (**S/N**) and Firmware Version (**F/W**) of the transceiver will display when the device is successfully connected to the system.



6. Enter the **Starboard**, **Forward** and **Down** offsets for the transceiver relative to the Central Reference Point (CRP) and then click **Apply**.

Adding an Attitude Sensor

Note

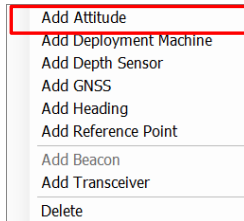
To delete a device from the list, right-click the chosen device and select Delete.

- When connected, the green status LED will display on the bottom panel.

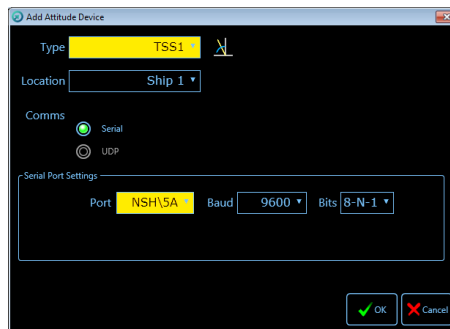


Adding an Attitude Sensor

- Right-click the vessel (**Ship 1**) and select **Add Attitude**.



- Select the **Type** and NSH **Port** from the drop-down lists.
- Select the correct **Baud Rate** from the drop-down list e.g. **9600** and then click **OK**.



Adding a Heading Device

- When the attitude sensor is connected, the green status LED will display on the bottom panel and the pitch and roll values will display on the top left and right of the window. If an AHRS is selected, the heading data will also be displayed at this stage.



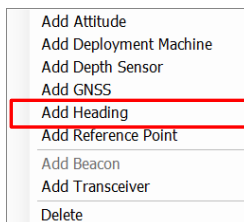
Note



If the pitch and roll values and green status LED do not display, the attitude sensor may not be connected due to an incorrect Baud Rate setting.

Adding a Heading Device

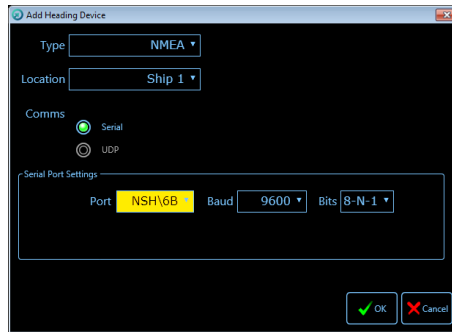
- Right-click the vessel (**Ship 1**) and select **Add Heading**.



- Select the **Type** and NSH **Port** from the drop-down lists.

Adding a Heading Device

3. Select the correct **Baud Rate** from the drop-down list e.g.**9600** and then click **OK**.



4. When connected, the green status LED will display on the bottom panel.



Note



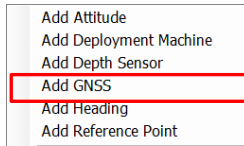
If the heading value and green status LEDs do not display, the heading device may not be connected due to an incorrect Baud Rate setting.

5. Once the **Heading Device** is added, the heading value will display on the bottom panel.

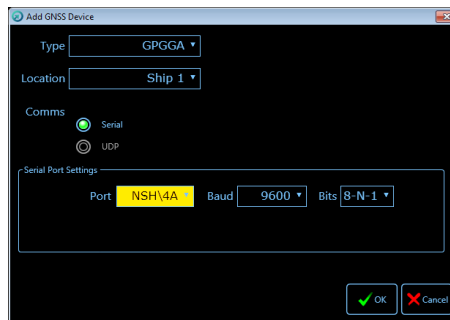


Adding a GNSS

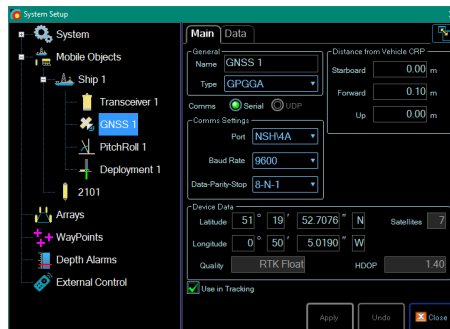
1. Right-click on the vessel (**Ship 1**) and select **Add GNSS**.



2. Select the **Type** and **NSH Port** from the drop-down lists.
3. Select the correct **Baud Rate** from the drop-down list e.g. **9600** and then click **OK**.



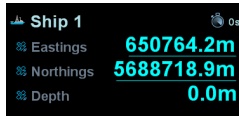
4. The **Longitude** and **Latitude** data will be automatically updated.



5. Enter the **Starboard**, **Forward** and **Up** offsets for the GNSS antenna relative to the CRP and then click **Apply**.
6. When connected, the green status LED will display on the bottom panel.



- The ship's GNSS position will be displayed.



Notes



An “aided” (non-acoustic) position is displayed with an underline (as above).



If the GNSS value and green status LED do not display, the GNSS may not be connected due to an incorrect Baud Rate setting.

Adding a Beacon

Quick Track Tool

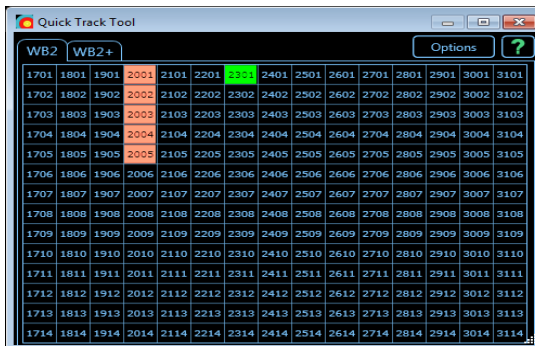
For simple jobs requiring a small number of 6G beacons, it will be easier and faster to add beacons to the job using the **Quick Track** tool.

For jobs with many beacons/complex acoustic scheduling, it is recommended to add beacons to the job using the **Beacons Table** described in the following section.

- Click **Tools > Quick Track** or click the **Q-Track** shortcut button.



- Click the required address(es) on the Quick Track tool (clicking the same address again stops that beacon tracking and removes it from the job).

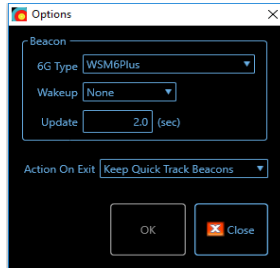


- A 6G beacon with that address is added to the job (see Options below for beacon type).

Adding a Beacon

4. An active Quick Track beacon is shown in green (beacon addresses already allocated are shown in pink).
5. A beacon output telegram is enabled (if there is a telegram setup).

Use **Options** on the Quick Track tool to configure the default **Beacon** type, **Wakeup** tone and **Update** rate.



Beacons Table

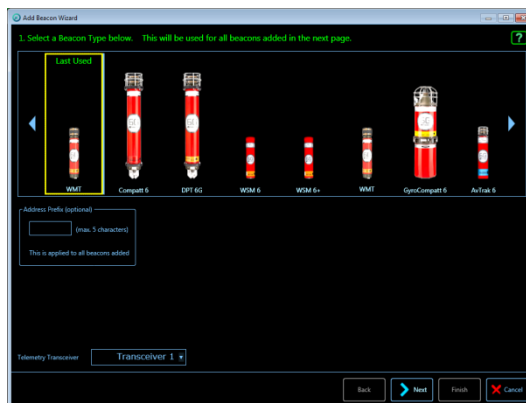
1. Right-click on **Mobile Objects** and select **Add Beacon** or click the **Beacons** shortcut button.



2. Click **Add** on the **Beacons Table**.



3. Select the beacon type on the beacon wizard window.
4. Enter the beacon **Address Prefix** (optional) and then click **Next**.



Adding a Beacon

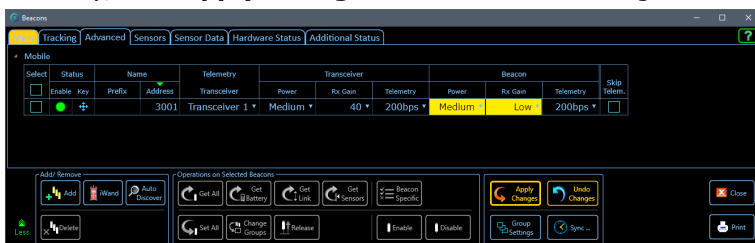
5. Select the beacon **Address(es)** from beacon address table and then click **Finish**.



6. Following successful telemetry communication with the beacons, the yellow warning triangles in the beacons table will change to green circles.
7. If the yellow warning triangles remain, the acoustic settings on the **Advanced** tab may need adjusting or the beacon addresses may need verifying.



8. Once all the yellow warning triangles have changed to green circles (as shown below), click **Apply Changes** to confirm the settings.



Setting the Environment

Note



The power settings are suggested by the Ranger 2 software for the Operating Range that has been set in the Environmental Settings.

Setting the Environment

1. Prior to tracking a beacon, click the **Environment** shortcut button.



2. In the **Environmental Settings** window, make sure suitable **Sound Speed** data and **Operating Range** have been selected.

Note



A new sound speed profile can be imported by selecting **Sound Speed Profile** and clicking **Load** or click **Estimated Profile** to get a default profile for your location.

Environmental Settings

Sound Speed

Select one of the following methods to determine sound speed.

☒ Fixed Values

Mean Ranging Sound Speed 1490.0 m/s

Transceiver Sound Speed 1490.0 m/s

☐ Sound Speed Profile

Load ... Estimated Profile

<No Sound Speed Profile Loaded>

Depth

Speed

☐ Sound Speed Sensor

N/A

Pressure to Depth

Atmospheric Pressure 100.00 kPa

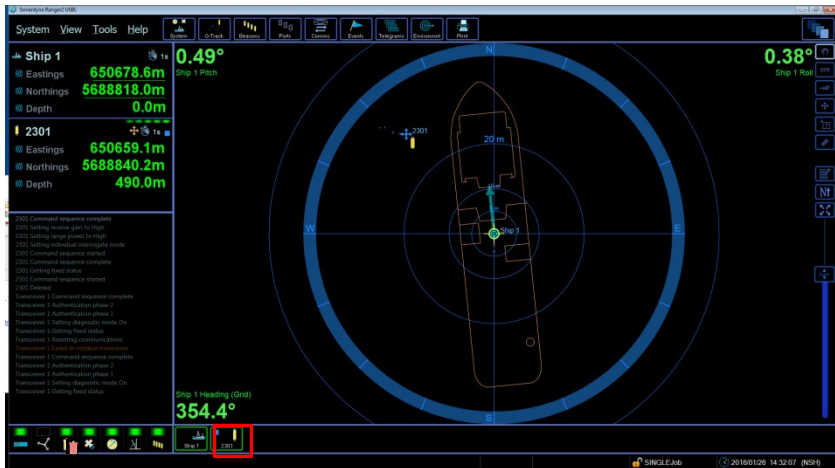
Latitude 51.33° ☒ Use GNSS

Operating Range 2500 m

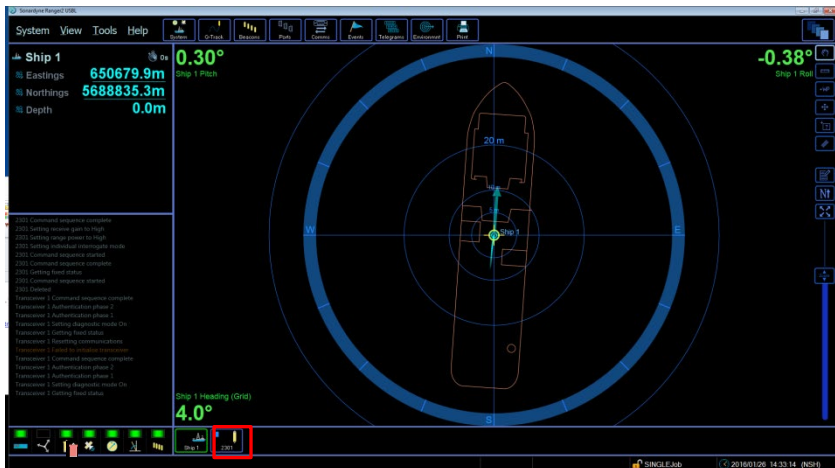
OK Cancel

Tracking a Beacon

1. To track a beacon, click the beacon button on the bottom panel.



2. To stop tracking a beacon, click the beacon button.



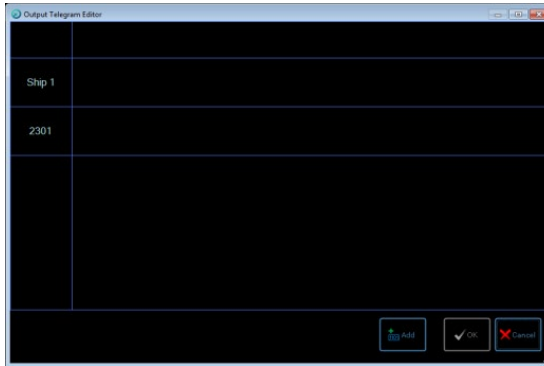
Adding a Telegram

Adding a Telegram

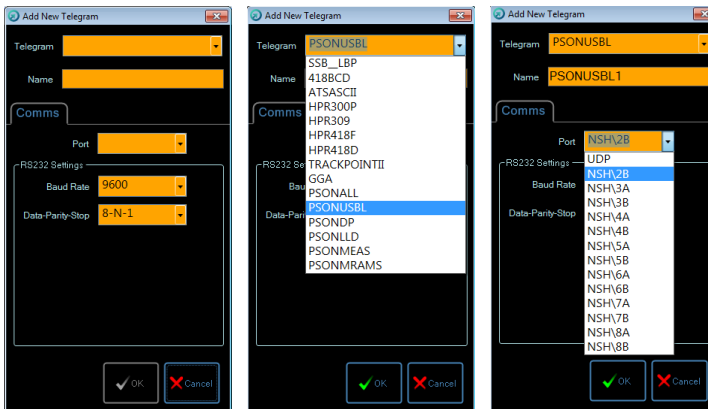
1. To add an output telegram, click the **Telegrams** shortcut button.



2. Click **Add**.



3. Select a telegram type from the **Telegram** drop-down list.
4. Select the appropriate **Port** and **Baud Rate** for the output telegram and then click **OK**.



5. Select the **Enable** checkbox.

Adding a Telegram

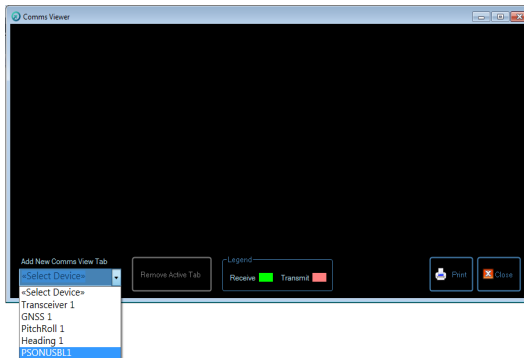
6. Select **Frame of Reference**, **Orientation** and **Index Number** for the output telegram and then click **OK**.



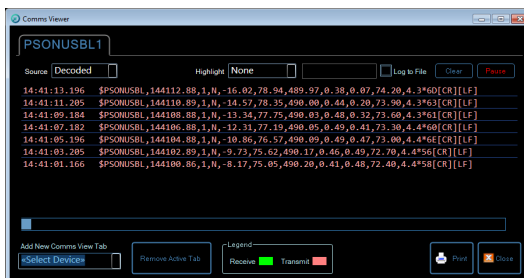
7. To verify telegram is functioning, start tracking device(s) and then click the **Comms** shortcut button.



8. Select the telegram from the **Add New Comms View Tab** drop-down list.

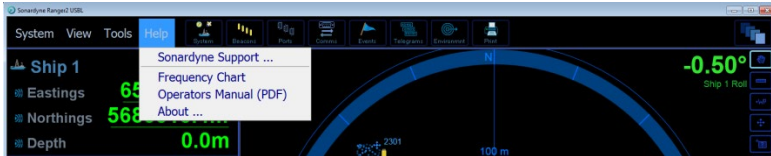


9. The telegram output should display in the **Comms Viewer**.

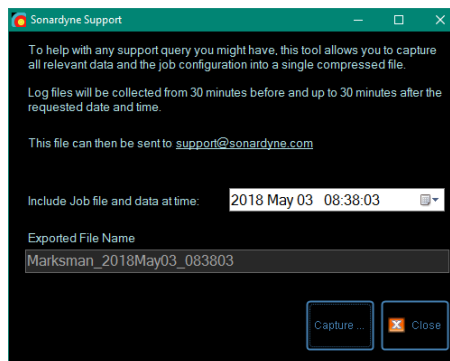


Sonardyne Support

If any difficulties or problems are encountered when attempting to operate the Ranger 2 system, click **Help** > **Sonardyne Support**.



1. Select the date and time the event occurred and then click **Capture**.
2. Browse to the desired folder for the output file and then click **OK**.
3. A support log file will be created containing logged data from 30 minutes before to 30 minutes after the target time. The support log file can be sent to Sonardyne Support for analysis.



Term	Definition
6+	Sonardyne instruments that can use Wideband 3 enabling sensor data to be embedded in navigation range replies e.g. Compatt 6+ 6+ instruments are also backward compatible with Wideband 2.
6G®	Sonardyne's sixth generation technology hardware platform
AHRS	Attitude and Reference Heading System
Beacon (Acoustic)	An instrument that emits acoustic signals. Common beacon types are: Transponder, Responder and Pinger
COMMS	Communications
GNSS	Global Navigation Satellite System
NAV	Navigation
MC	Marine Computer
NSH	Navigation Sensor Hub
Sonardyne	Sonardyne International Limited and its affiliates
Sonardyne Wideband®2 (WB2)	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
Sonardyne Wideband®3 (WB3)	Telemetry protocol available with 6G "+" devices that enables sensor data to be embedded in navigation range replies

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