Sonardyne

UM-8327

User Manual for Type 8327 RT 6-1000

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Amendment history

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

Issue	Revision	Date	Comments	Section	Page
A	1	01/07/2019	Initial Issue	All	All
A	2	05/11/2019	Upthrust buoys changed from 4.2 to 3.5 kg	5.4	28
B	1	08/03/2021	Battery life changed from 15 to 13 months NFC Configurator description added Rope Canister Appendix added Manual updated with new branding	11 All Appendix A All	41 All All All
B	2	18/05/2021	Rope Canister: rope length changed from 75 m to 70 m	5.4 10.2 11 Appendix A	38 50 51, 52 53, 55, 59, 60
B	3	20/06/2022	Deck Topside details added and general update Battery life specifications updated	All 11	All 47
B	4	30/01/2025	Updated procedure for removing the endcap/replacing the battery NFC Configurator images updated	7.6.3, 7.6.4, 7.6.5 3.3, 4.7.4	39, 40 8, 20
B	5	18/03/2025	Updated to indicate rope and shackles are no longer supplied as standard.	3.1.1	4

Section 1 – Introduction

1.1 Purpose

This user manual contains information for personnel involved in operations utilising the RT 6-1000. It includes technical information for installation, operation, and maintenance.

1.2 Scope

This User Manual describes the safe installation, operation, and maintenance of the Type 8327 Release Transponder 6 (RT 6-1000). The information and procedures within this manual are based on Sonardyne's experience and knowledge.

1.3 Related publications

The following publications can be referred to in conjunction with this manual.

Table 1-1 Related publications

Publication	Title
Sonardyne Safety Manual	*Operational and Safety Precautions*
RT6 App Quick Start Guide	*Sonardyne RT6 Quick Start Guide* (integrated into the RT6 App)
UM-8373-Deck Topside	*User Manual for the Type 8373-Deck Topside user manual*
UM-8315	*User Manual for the Type 8315 iWand*
QSG-OG-8315	*iWand Operation Guide*
QSG-OG-8325	*NFC Configurator Operation Guide*
UM-8251	*Ranger 2 User Manual*

1.4 Conventions

The following conventions are used with this manual.

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**
Italic Type	References to Figures, Tables, Sections and internal/external source

Section 2 – Saftey

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 that 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 the subsea equipment being operated.

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.

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.

2.2 Safety procedures

Warning and Caution terms used in this document are described below:

- Warning: indicates potential for property damage, personal injury or death.
- Caution: indicates potential for damage to hardware, malfunction or loss of data.

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.**

⚠ **Mechanical hazard risk. Do not place hands near the release mechanism when in operation.**

⚠ **If the battery pack has failed or water has penetrated the internal housing, the battery pack may vent gasses causing the build-up of internal pressure.**

⚠ **High Internal pressure risk. Due to the high internal pressure risk, dismantling the sub-sea equipment must only be carried out by suitably qualified personnel.**

⚠ **Risk of toxic gases and liquids. Make sure the work environment is well ventilated. Toxic gases and liquids may be released when operating the pressure relief vent valve.**

Ensure the work environment is well ventilated. Toxic gases and liquids may be released when operating the pressure relief vent valve.

Risk of burns. Do not carry out maintenance on the transponder if the housing is hot. Lower the transponder into cold water and wait for the housing to cool. Wear Personal Protective Equipment such as gloves.

The maximum release load of 150 kg only applies if the shaft and nut are coated with underwater grease and the correct battery pack is used.

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.

Multiple beacon address conflict. Do not operate multiple beacons on the same address in the water at the same time. The address must be unique to any one beacon operating in the same acoustic area.

Protective coating failure. Do not use any abrasive brushes or sharp tools to remove marine growth when cleaning the instrument.

The transducer wiring is attached to the internal PCB. when removing the endcap, take care not to pull or tension these wires.

The rating of the rope is degraded by long-term exposure to UV light.

Once significant load has been applied to a release nut then it should be replaced.

Due to wear on the release nut, it is advisable that the nut is replaced at least every 5th deployment.

Ensure that the RT 6-1000s transducer has a clear line-of-slight path to the surface. Do not obstruct the transducer or the acoustic performance will be degraded.

Do not deploy the RT 6-1000 using the small endcap shackles.

Ensure that all shackles are 'moused' or wired to prevent them coming undone.

Ensure that there is a note of the RT 6-1000s acoustic identity and associated GPS drop position.

Ensure that when the RT 6-1000 is deployed, there is enough buoyancy to lift it and any other attached instrumentation/mooring to the surface. The weight of the unit in water is approximately 0.4 kg or 0.75 kg with rope canister. It is recommended that at least 7 kg of buoyancy is used.

Ensure the nut is not engaged at an angle as this may cause the nut to cross-thread causing damage; replace the nut if this happens. If the nut becomes cross-threaded during loading, the release mechanism may current-limit and stop before the nut bottoms against the endcap. Always monitor the nut being loaded and ensure that the nut stops against the endcap during loading, or the WLL of the unit may be compromised.

Section 3 – Technical description

3.1 Introduction

3.1.1 Design

The Release Transponder 6 (RT 6-1000) has been designed for use in continental shelf waters to water depths of 1,000 meters using Sonardyne's Wideband®2 acoustic ranging and telemetry protocol. RT 6-1000 has both receive and transmit functions, enabling accurate slant ranges and position to be accurately determined, and release actuation confirmed with a Working Load Limit (WLL) of 150 kg.

The RT 6-1000 can be used in both Transponder Mode (subsea) and Topside Control Mode (to release another subsea RT 6-1000); see *Section 3.1.3 "Recovery".*

Two (optional) removable rope bridle shackles ❹ allow the RT 6-1000 to be held when deploying or used to attach a float; see *Section 10 – Spares* for details. Two smaller shackles on the release endcap ❷ allow the RT 6-1000 to be "dunked" over the side when used in Topside Control Mode; see *Section 3.5.3 "Shackle".*

Figure 3-1 Type 8327 RT 6-1000



❶ Release nut	❷ Release endcap shackle (x2)
❸ Endcap retaining pin (x2)	❹ Rope bridle shackle (x2) – optional
❺ Transducer	❻ Deployment rope (bridle) – optional

3.1.2 Configuration

The RT 6-1000 can be configured using the following methods:

- Deck Topside, either acoustically or with a USB NFC reader; see *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.
- An NFC enabled Android device with the Sonardyne RT6 App; see *Section 4 – Installation and configuration*.
- Sonardyne NFC Configurator Software with a USB NFC reader using a suitable PC; see *Section 3.3 "NFC Configurator".*
- A Sonardyne iWand handheld acoustic transponder; see *Section 4 – Installation and configuration*.

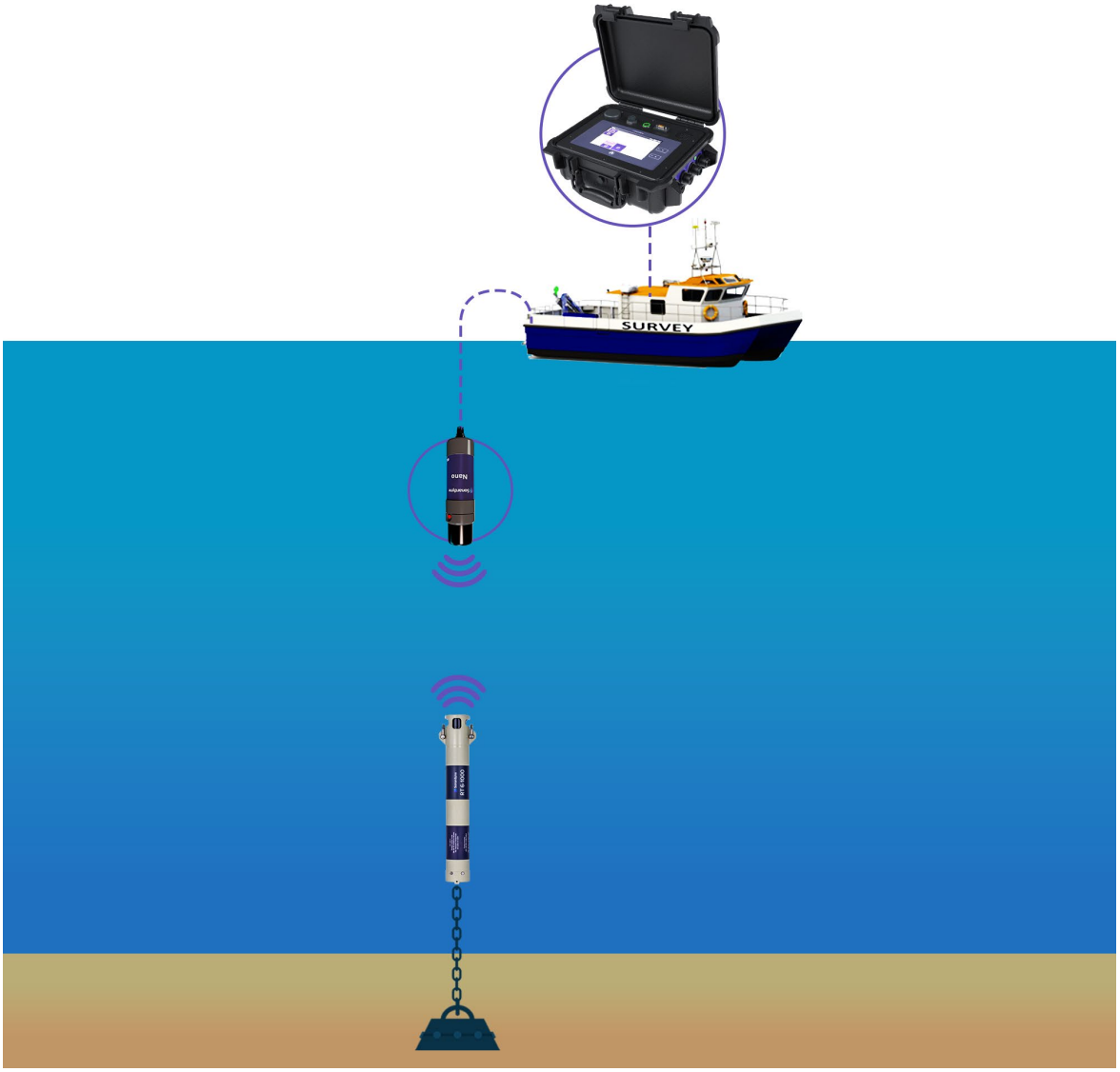
3.1.3 Recovery

The RT 6-1000 can be recovered from the seabed using the following methods:

- Deck Topside with dunker; see *Section 3.1.3.1 "Deck Topside".*
- The Sonardyne RT6 App with another RT 6-1000 used in Topside Control mode; see *Section 3.1.3.2 "RT 6-1000 in Topside Control Mode"*.
- Ranger 2 USBL; see *UM-8251 "Ranger 2 User Manual".*

3.1.3.1 Deck Topside

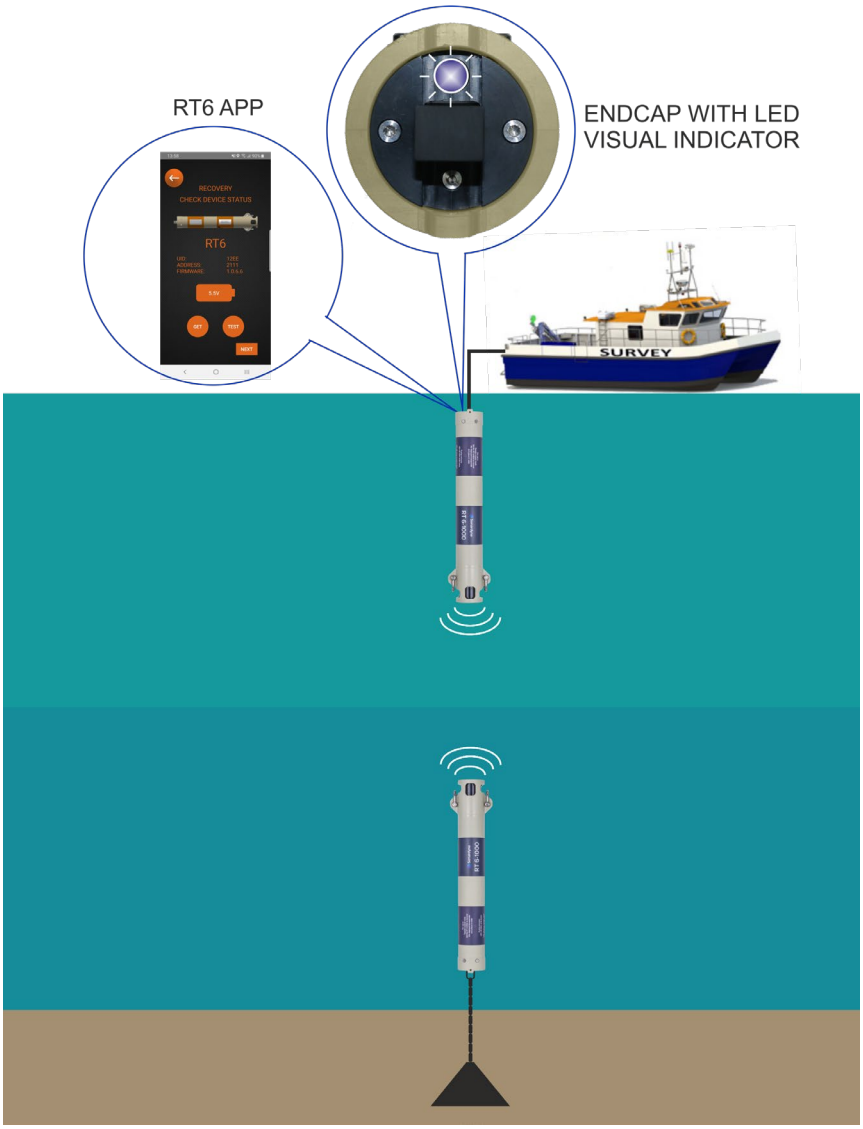
A Deck Topside with a dunker can be used to recover an RT 6-1000 as shown in the example below; see *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.



3.1.3.2 RT 6-1000 in Topside Control Mode

An RT 6-1000 can be used to recover a subsea RT 6-1000 from the seabed. The RT 6-1000 is used as a Topside Control and is programmed to release the subsea RT 6-1000 using the RT6 App on an NFC enabled Android™[1] device. The RT 6-1000 uses an LED in the endcap to give a visual indication of the release process.

The diagram below shows an example of how a deployed RT 6-1000 can be released using another RT 6-1000 which is setup in Topside Control mode using the RT6 App.



3.2 RT6 App

An NFC enabled Android device with the Sonardyne RT6 App installed can be used to configure the RT 6-1000 and run self-test functions, read battery status, and load the release nut prior to deployment. The NFC link also provides the ability to enter RT 6-1000 into a storage mode when not in use, thereby significantly increasing the overall battery endurance.

[1] Android is a trademark of Google LLC

Notes

The RT6 App uses the Google Maps API for it's mapping features. When the app is installed or re-installed, the Google Maps API will need to validate the licence and so the Android device will need an internet connection. Once validated, an internet connection is no longer required for continued use of the app.

3.2.1 RT6 App description

The Sonardyne RT6 App has been specially developed to configure and release the RT 6-1000 and can be downloaded from the Google Play™ store and installed on an Android device.

The App contains an integrated Quick Start Guide to guide you through the functions.

The RT6 App home screen and functions are described in *Table 3-1*.

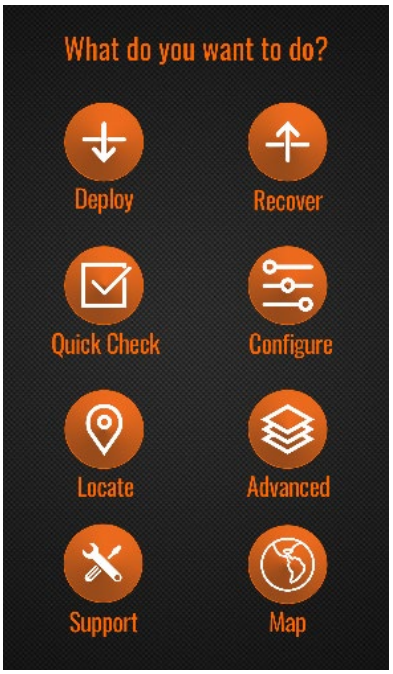
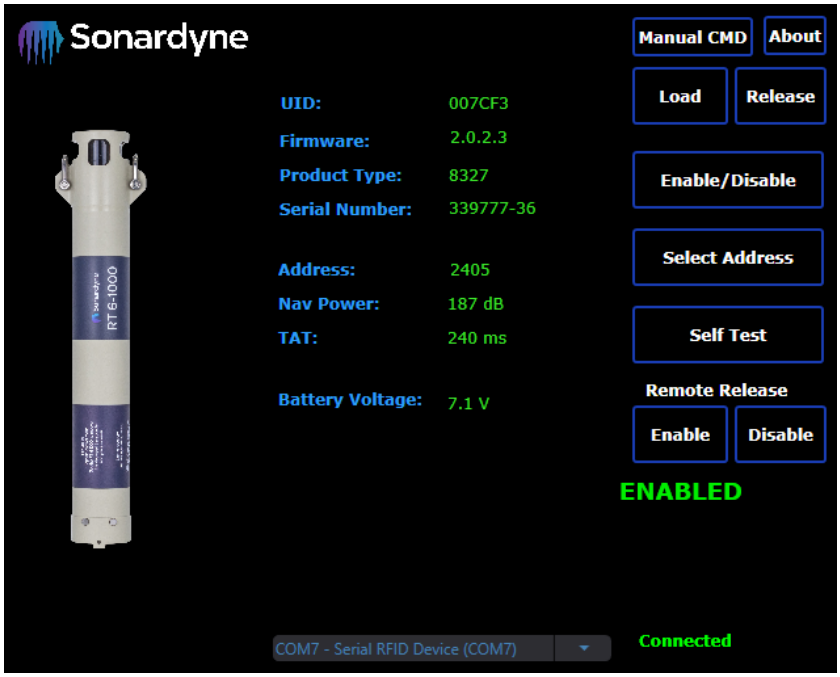


Table 3-1 RT6 App Functions

App Function	Command sequence	Description
Deploy	Deploy > Get > Next > Skip > Load Nut	Releases and Loads the Release Nut
Recover	Recover > Get > Next > Select Address > Initiate Release	Selects the address of beacon to recover and initiates Release sequence
Quick Check	Quick Check	Checks and tests the device status
Configure	Configure	Connects/disconnects the battery Changes the address
Locate	Locate > Get > Next > Select Address > Locate/Stop and Get Ranges	Selects and Ranges to a beacon
Advanced	Advanced	Advanced functions
Support	Support	Support contact information and Quick Start Guide
Map	Map > Add Waypoint	Displays a map of your current location and allows waypoints to be added

3.3 NFC Configurator

To configure the transponder using NFC Configurator, a USB NFC reader and a suitable PC with the NFC Configurator software installed is required; see *QSG-OG-8325 "NFC Configurator Operation Guide"* for more information.



The USB NFC reader is placed adjacent to the NFC antenna on the transponder as shown below.



3.4 RT 6-1000 options

An optional attachment for the RT 6-1000 is a rope canister that allows items left on the seabed, for example, tools, cables and salvage, to be quickly and easily hauled up. This works by mooring one end of the rope to the item on the seabed and the other end to the RT 6-1000 via the attached rope cannister. As the transponder ascends to the surface, high strength rope is deployed from the canister. This line can then be used to pull up the item directly or retrieve heavier tag lines; see *Section 5.4 "Rope Canister".*

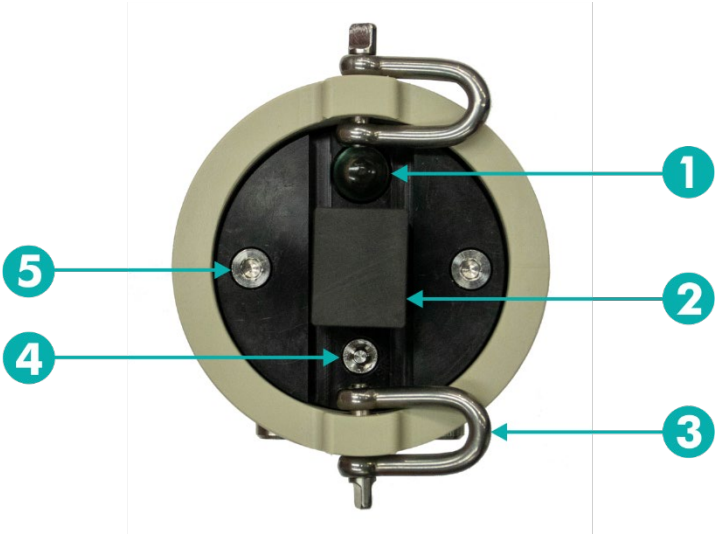
3.5 Release endcap

3.5.1 Description

The release endcap can be removed by a suitably qualified person in order to replace the battery pack.

The endcap is described in *Figure 3-2*.

Figure 3-2 RT 6-1000 endcap description



1 LED visual command indicator	2 Release nut
3 Release endcap shackle for Topside Control (x2)	4 Pressure relief vent valve
5 M3 retaining screw (x2)	

3.5.2 LED command indicator

An LED command indicator provides visual indication when operating the release mechanism as follows:

Release mechanism function	LED command indicator status
Opening/closing and collecting ranges	Flashes every five seconds
Completed the opening/closing cycle and after two successful telemetry commands have completed (range collection)	Solid

3.5.3 Shackle

3.5.3.1 Endcap shackle

The release endcap contains two removable shackles for use with a suitable rope for holding the RT 6-1000 over the side to release a subsea RT 6-1000; see *Figure 3-2,* item ❸.

Note

These shackles should be removed when deploying a subsea RT 6-1000 to eliminate the possibility of the release nut mistakenly being tied to one of these shackles.

3.5.3.2 Deployment shackle

The larger removable deployment shackles (on the transducer end) are used for holding the RT 6-1000 when deploying and together with the release nut have a WLL of 150 kg; see *Figure 3-2,* item ❷.

3.6 Battery

The RT 6-1000 is supplied with an alkaline battery pack that can be replaced in the field when required.

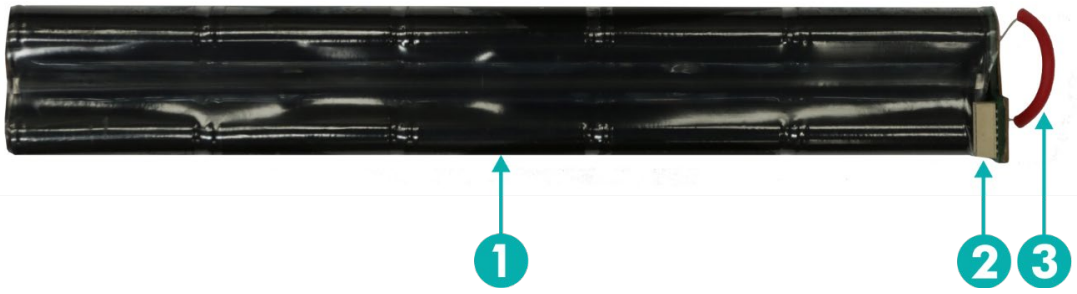
The battery packs provide a listening life of >13 months.

The battery should have a start voltage of >7.5 V. The end-of-life voltage is <4.5 V.

Note

Voltages are correct for room temperature (20°C); at typical water temperatures <8°C voltage may be up to 0.5 V lower than described in this manual.

Figure 3-3 RT 6-1000 Battery Pack



❶ Battery cells	❷ Connector
❸ Removal pull-loop	

The battery can be connected/disconnected using the RT6 App; see *Section 4.3 "Connecting and disconnecting the battery"*.

Replacement battery packs must be obtained from Sonardyne. To replace the battery pack, see *Section 7.6 "Replacing the battery"*.

3.7 Pressure relief vent valve

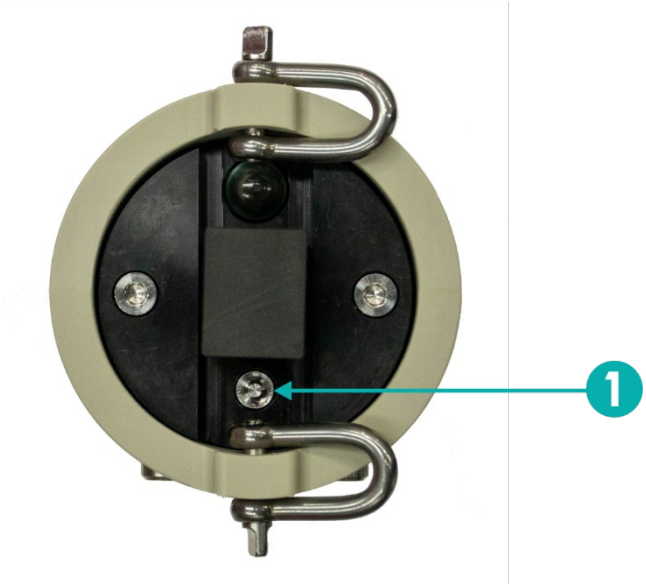
A pressure relief vent valve is fitted to automatically release any build-up of pressure inside the RT 6-1000. This could be caused by water ingress during deployment and/or the outgassing of the battery.

In normal conditions the pressure relief vent valve should always be flush with the endcap face.

The valve is spring loaded and operated by gripping the top recess with a suitable tool and pulling gently upwards.

The valve is shown below ❶ in the closed position.

Figure 3-4 Pressure relief vent valve



Note

The pressure relief vent valve should always be operated before opening the RT 6-1000; see *Section 7.5 "Operating the pressure relief vent valve".*

Section 4 – Installation and configuration

4.1 Introduction

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

The RT 6-1000 can be setup and configured ready for deployment using:

- Deck Topside, either acoustically or with a USB NFC reader
- NFC Enabled Android Device using the RT6 App
- Sonardyne iWand handheld acoustic transponder
- Sonardyne NFC Configurator Software with a USB NFC reader using a suitable PC

4.2 Pre-use installation checks

On receipt, the transponder will be in a fully working condition, with the internal battery pack fitted and electrically disconnected.

Before installation and deployment, checks should be carried out to make sure the RT 6-1000 is serviceable and ready for use. These checks include:

1. Inspect the RT 6-1000 for any signs of mishandling, external damage or leakages.
2. Electronically connect the internal battery using the RT6 App; see *Section 4.3 "Connecting and disconnecting the battery"*.
3. Check the battery status; see *Section 4.4 "Checking the battery".*
4. Check the pressure relief vent valve; see *Section 7.5 "Operating the pressure relief vent valve".*

Notes

Inspection must be performed by a Competent Person experienced in lifting equipment.

4.3 Connecting and disconnecting the battery

4.3.1 Connecting the battery

4.3.1.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

4.3.1.2 RT6 App

Notes

Ensure the Android device is positioned correctly against the transducer of the RT 6-1000. If a connection cannot be established, try repositioning the Android device as the antenna position within these devices can vary.

If no NFC device is available, the RT 6-1000 can be enabled by disconnecting the battery for >10 seconds and then reconnecting it.

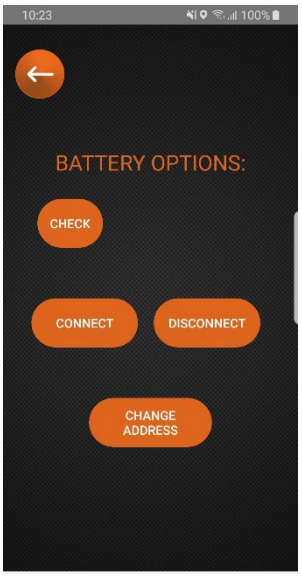
If the battery has been disconnected, it must be connected before use.

To electronically connect the battery using the RT6 App:

1. Tap **Configure**.



2. Tap **Connect**.



3. Tap **Check** to confirm the battery is connected if the information doesn't update automatically.

4.3.1.3 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide, Section "Enabling and disabling".*

4.3.2 Disconnecting the battery

4.3.2.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

4.3.2.2 RT6 App

Follow the procedure in *Section 4.3.1.2* and tap **Disconnect** in *Step 2*.

4.3.2.3 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide, Section "Enabling and disabling".*

4.4 Checking the battery

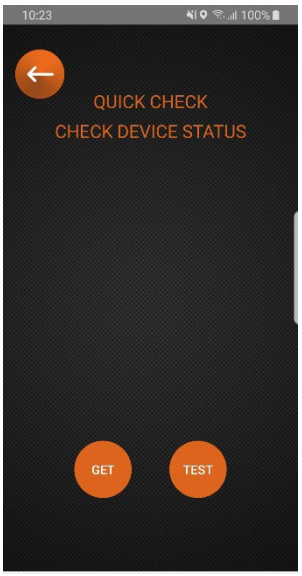
The battery should have a start voltage of >7.5 V. The end-of-life voltage is <4.5 V.

4.4.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

4.4.2 RT6 App

1. Tap **Quick Check**.



2. Tap **Get**.



3. The battery voltage is displayed on the battery icon.

4.4.3 iWand

See *UM-8315 "User Manual for the Type 8315 iWand", Section "Quick Check > Battery Status"*.

4.4.4 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide".* The battery status is displayed on the main window.

4.5 Self-test (Quick Check)

A Self-Test using Quick Check confirms the instrument is working correctly. To perform a Self-Test:

4.5.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

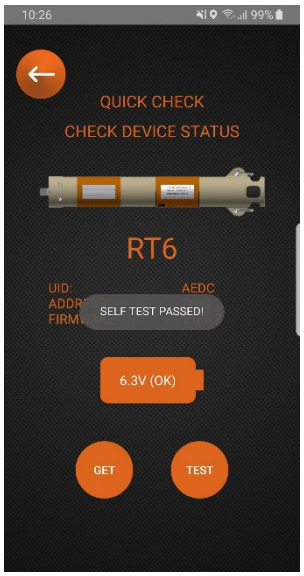
4.5.2 RT6 App

1. Tap **Quick Check**.



2. Tap **Get** and then **Test**.





3. **SELF TEST PASSED!** is displayed if the test is successful.

4.5.3 iWand

See *UM-8315 "User Manual for the Type 8315 iWand", Section "Quick Check"*.

4.5.4 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide" Section "Performing a Self Test".*

4.6 Setting the address

4.6.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

4.6.2 RT6 App

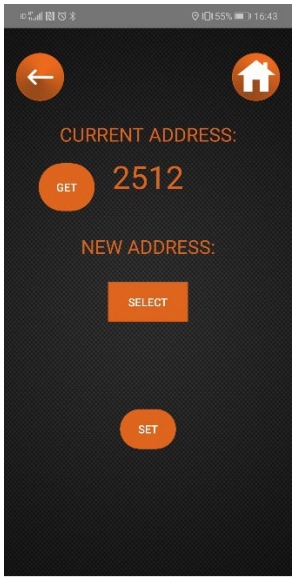
To set the address of the RT 6-1000:

1. Tap **Configure**.



2. Tap **Change Address**.
3. Tap the **New Address** boxes, select the new Address and then tap **Set**.





4.6.3 iWand

See *UM-8315 "User Manual for the Type 8315 iWand", Section "Quick Check > Get and Set Configuration"*.

4.6.4 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide" Section "Setting the Address".*

4.7 Loading the release mechanism

4.7.1 Deck Topside

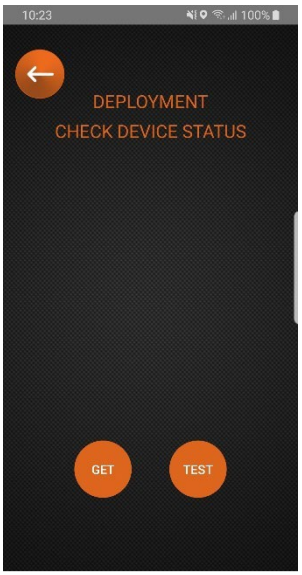
See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

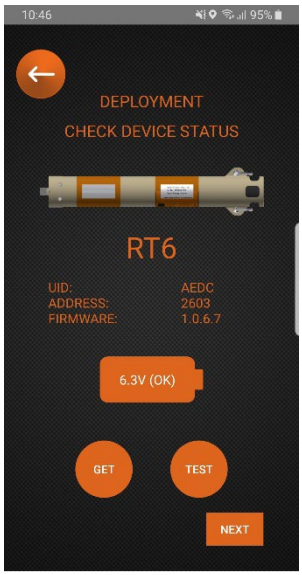
4.7.2 RT6 App

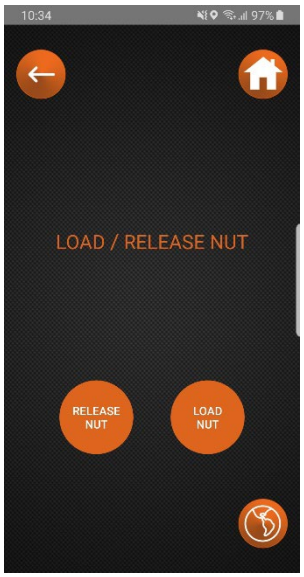
1. Open the RT6 App.
2. Tap **Deploy**.



3. Load the release nut; tap **Get > Next > SKIP > Load Nut**.







Note

See *Section 4.7.5 "Installing the release nut onto the RT 6-1000"* for information on handling the release nut mechanism.

4.7.3 iWand

Note

Ensure the iWand transducer is pressed firmly against the transducer of the RT 6-1000.

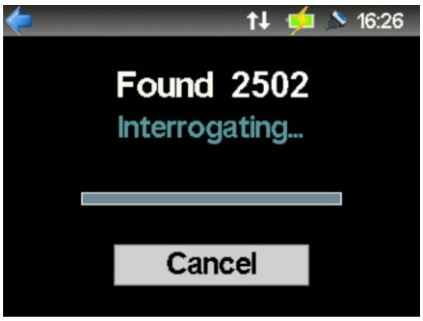
1. On the iWand main menu select **Quick Check**.
2. To begin the sequence press **ENT** (this will begin with a Discovery process).



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



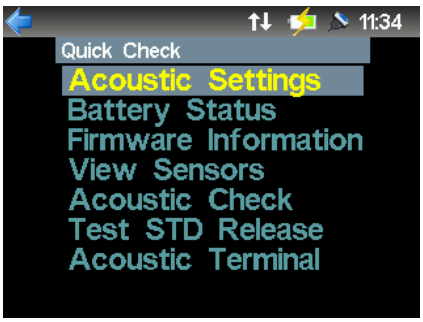
4. When the instrument is found the iWand will start acquiring information.



5. On completion of the Discovery and interrogation processes the Quick Check menu will open.

Note

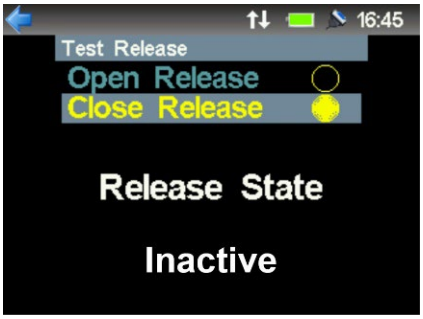
Depending on the configuration of the instrument, various options within the Quick Check menu (e.g. View Sensors, HPR check etc.) may not be displayed.



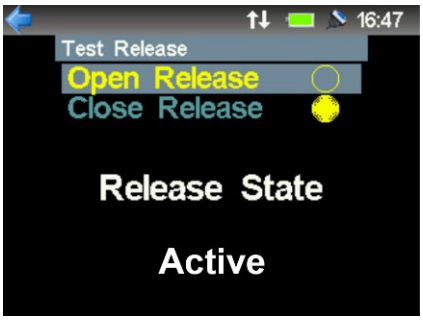
6. Select **Test STD Release** and follow the next two sections to open or close the release mechanism.
7. See *Section 4.7.5 "Installing the release nut"* for information on handling the release nut mechanism.

4.7.3.1 If the Release Nut is Installed

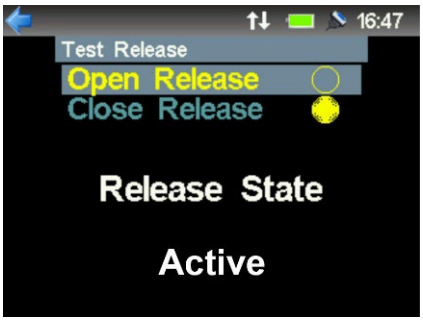
1. The iWand **Test STD Release** screen displays the current state of the release mechanism (**Inactive**).



2. To unwind the release nut, select **Open Release** and then press **ENT** (**Active** is displayed while the release mechanism is operating.



3. **Active** is displayed when the release nut mechanism has fully unwound.



4. To load the release nut, select **Close Release** and then press **ENT**.

Note

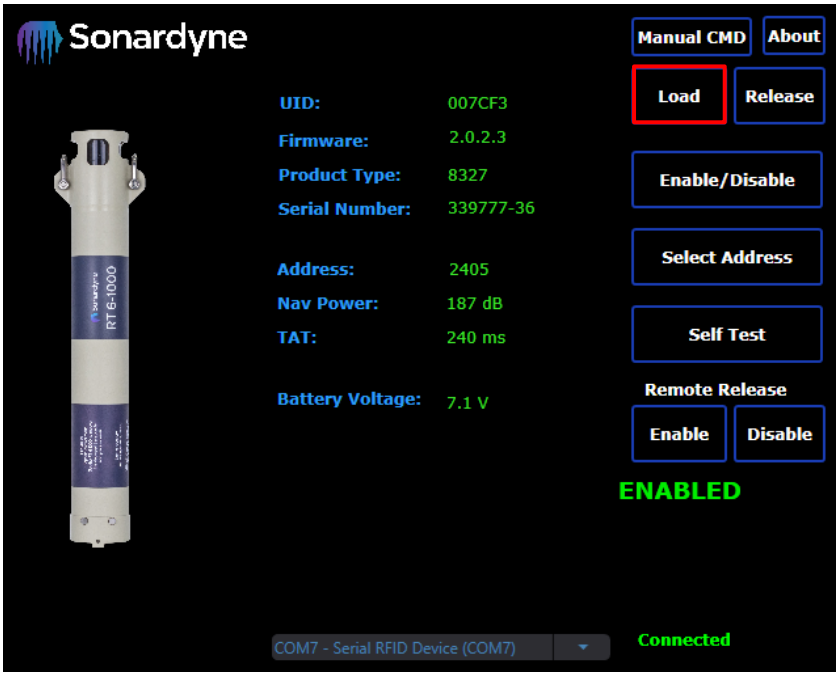
The release nut will wind on and then should unwind slightly to relieve tension and should feel slightly loose.

5. See *Section 4.7.5 "Installing the Release Nut"* for information on handling the release nut mechanism.

For more information about configuring an instrument using an iWand, see *UM-8315 "User Manual for the Type 8315 iWand"* Section, *"Test Release".*

4.7.4 NFC Configurator

See *QSG-OG-8325 "NFC Configurator Operation Guide" Section "Testing an RT 6-1000 Release".*



4.7.5 Installing the release nut onto the RT 6-1000

Notes

The following procedure is described using the RT6 App.

Remove the two shackles on the release endcap.

Grease the stainless steel shaft of the release mechanism and the release 'nut' thread with underwater grease prior to loading the mechanism. This reduces the starting torque on the motor, and therefore significantly increases the release load reliability of the RT 6-1000.

1. Using either the Deck Topside, RT6 App or iWand as described above.
   a. Open the Deck Topside, or
   b. Open the RT6 App, or
   c. Start the iWand.
2. Hold the release nut against the release mechanism thread and on the Deck Topside NFC Device or RT6 App and tap **Load Nut**; see *Section 4.7 "Loading the release mechanism".*
3. The release shaft will rotate for 60 seconds; during this period insert the 'nut' onto the shaft ensuring it engages cleanly.
4. Loading the nut will take approximately 30 seconds before it bottoms against the endcap (while loading, the release mechanism is set to low-power and the current drawn by the motor is automatically sensed to detect when the nut bottoms against the endcap).
5. When high current is sensed, indicating the nut has been fully loaded, the release mechanism will reverse direction for 1.5 seconds and wind the nut off the endcap. This is to minimise the power required on start-up to release the nut in operation.

Figure 4-1 Loading the release nut into the release mechanism



CAUTIONS

Ensure the nut is not engaged at an angle as this may cause the nut to cross-thread causing damage; replace the nut if this happens. If the nut becomes cross-threaded during loading, the release mechanism may current-limit and stop before the nut bottoms against the endcap. Always monitor the nut being loaded and ensure that the nut stops against the endcap during loading, or the WLL of the unit may be compromised.

Once significant load has been applied to a release nut then it should be replaced.

4.8 Pre-deployment checklist

The following checklist can be used to ensure all the necessary steps have been followed prior to subsea deployment.

Item	Check
Type Number	8327
Address:	
UID:	
Serial Number:	
Firmware Version:	
Checked by:	

Reference	Check	Tick/comment
Section 4.2 "Pre-use installation checks"	Perform pre-use installation checks	
Section 4.6 "Setting the address"	Apply the correct acoustic address	
Section 4.5 "Self-test (Quick Check)"	Run a self-test	

Section 5 – Operation

5.1 Introduction

The RT 6-1000 can be operated using a Sonardyne 6G Topside Control system, including:

- Deck Topside
- Android RT6 App
- Ranger 2 USBL

The system will identify the RT 6-1000 and enable the releasing functions to be performed.

Refer to the system's user manual for instructions on operating the RT 6-1000.

5.2 Deploying the subsea RT 6-1000

5.2.1 Adding buoyancy

Ensure that when the RT 6-1000 is deployed, there is enough buoyancy to lift it and any other attached instrumentation/mooring to the surface. The weight of the unit in water is approximately 0.4 kg or 0.75 kg with rope canister. It is recommended that at least 7 kg of buoyancy is used.

CAUTIONS

Ensure that the RT 6-1000s transducer has a clear line-of-slight path to the surface. Do not obstruct the transducer or the acoustic performance will be degraded.

Remove the small endcap shackles before deploying.

Ensure that all shackles are secure or wired to prevent them coming undone.

5.2.2 Attaching a sinker weight

Ensure the sinker weight is tied securely to the release nut and has enough mass to overcome the buoyancy of the float and resist drag from tidal currents to hold position firmly on the seabed.

5.2.3 Recording the deployment position

Note

Ensure that there is a note of the RT 6-1000s acoustic identity and UID before deploying.

It's important to record the position of the deployed subsea RT 6-1000 for later recovery using one of the following methods:

- Making a note of the current GPS position.
- Using the Deck Topside/RT6 App Waypoint.
- Using Ranger 2 to position to the subsea RT 6-1000 after it has settled on the seabed.

5.2.3.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

5.2.3.2 RT6 App

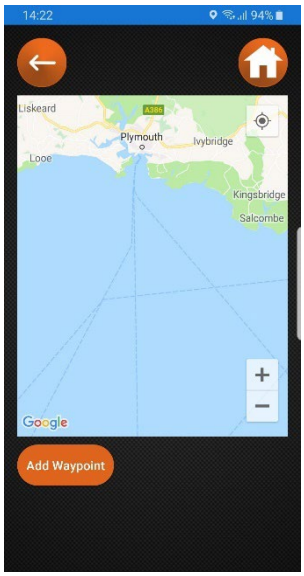
Recording current position

To record the deployment position using the RT6 App:

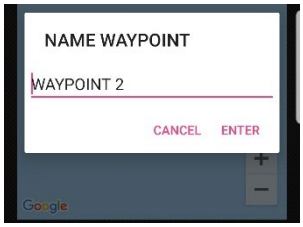
1. Open the RT6 App.
2. Tap **Map**.



3. Tap **Add Waypoint**.



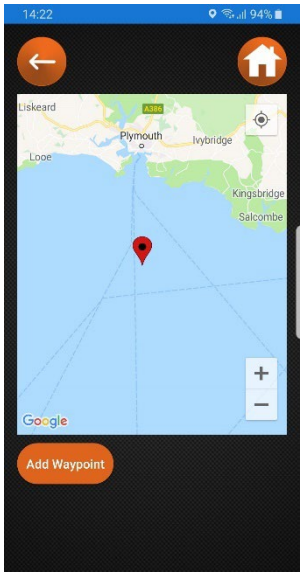
4. Enter a name for the new waypoint.



5. The new waypoint will be displayed in your current position.

Note

New waypoints are coloured red. When the app is reopened waypoints change to blue.



Exporting an RT6 database

The RT6 App keeps a record of activities such as NFC transactions and waypoints etc. in an individual database file for each instance the app is run.

The Database contains data including:

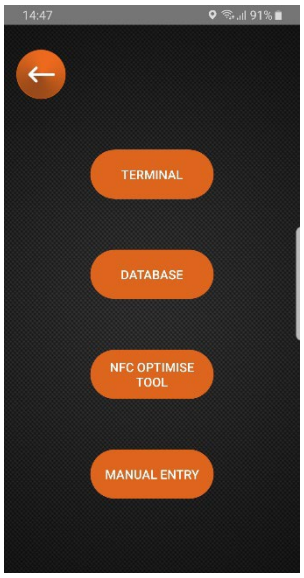
- System date and time stamp
- GPS position
- UID
- Device address
- Ranges

To export the Database:

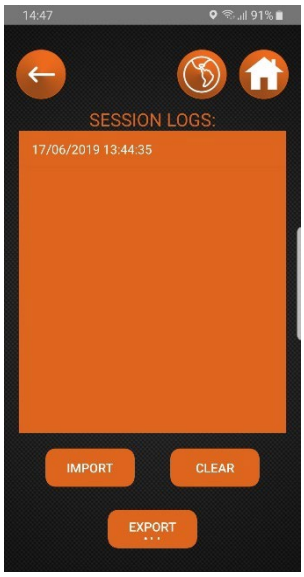
1. Tap **Advanced**.



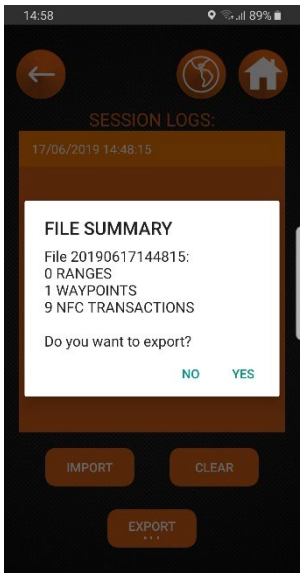
2. Tap **Database**.



3. Tap to select the database to export (the current session will be the last in the list).



4. On the File Summary, tap **Yes**.



Notes

To export multiple logs, tap Export All without selecting any logs.

To clear all logs, tap Clear.

5. Select a file location to save the Database files to and then tap **Save**.

Note

Two file types are exported:

.db3 (this file can be imported into an RT6 App).

.csv (allows details of the current database to be viewed).

Importing an RT6 database

Databases can be imported into the RT6 App. This allows data such as waypoints, ranges, device addresses and UIDs to be shared between Android devices.

To import an RT6 Database

1. Tap **Advanced > Database > Import**.
2. Select the **.db3** file to import.
3. The app will display **IMPORT SUCCESS!** If the import is successful.

5.2.3.3 Ranger 2

To record the deployment position using Ranger 2:

1. Ensure GNSS (GPS) is configured for the current job in System Setup.
2. Range to the deployed subsea RT 6-1000 after it has settled and record the final position; see *UM-8251 "Ranger 2 User Manual"* for more information.

5.2.4 Locating a deployed subsea RT 6-1000

It is possible to derive an approximate location of the deployed RT 6-1000 using the "Locate" function in the RT6 App.

When the Locate process is started and the Topside Control is transmitting, the RT6 App stores the GPS position of the Android device. When the ranges are uploaded the RT6 App uses the timestamp of the ranges to link them with the Android device location at the time of the ranges. This information is stored to the database and a circle is plotted on the MAP page with a radius matching this range.

By either repeating this process or by moving vessel location during the ranging process (a circle around the approximate location of the transponder of radius >1.5 water depth is optimal if possible), a series of overlapping circles will show on the map will give a clear indication of the deployed transponder's location.

Note

As no depth information is available, the circles will show the range as if the RT 6-1000 is at 0 m depth; the deeper the RT 6-1000, the more the circles will overlap.

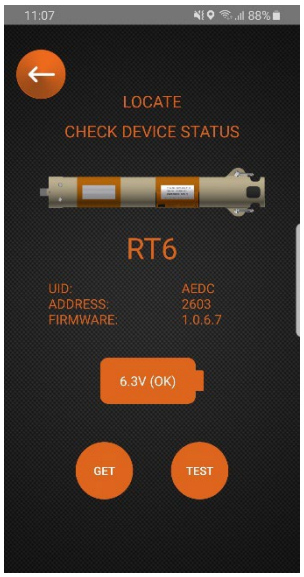
If greater accuracy is required, the database can be exported, and independent calculations can be performed on the geolocated positions.

To locate to and check the position of the subsea RT 6-1000:

1. Secure a suitable rope to the release endcap shackles ready for dunking.
2. Open the RT6 App.
3. Tap **Locate**.



4. The Device Status displays the UID, Address and Firmware of the Topside Control RT 6-1000.



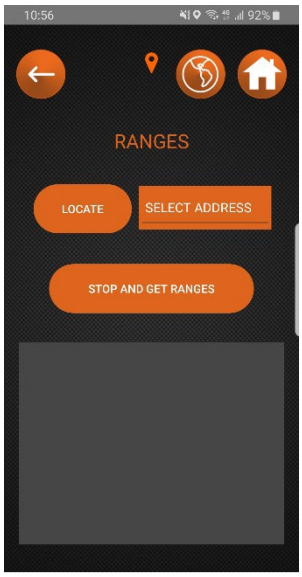
5. Tap **Get** to refresh the information.

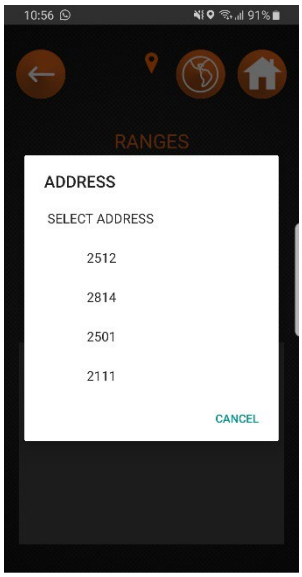
6. Tap **Next** and then tap **Select Address** (select the address of the subsea RT 6-1000).

Note

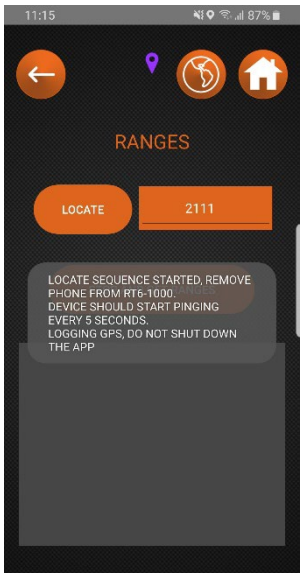
The address will be listed if the same NFC enabled Android device has been used to deploy the subsea RT 6-1000; if the address required is not listed it can be manually added; see *Section 5.3.5*.







7. Tap **Locate** (the Topside Control RT 6-1000 will begin transmitting every five seconds and a message confirmation will confirm if the command has been successful).



8. The Topside Control RT 6-1000 is now ready to be dunked over the side to allow the range to the RT 6-1000 to be measured.

Note

The Waypoint icon changes to flashing purple to indiacte a GPS is active.

9. The Locate status is visually displayed by the blue LED on the endcap as follows:

   a. Locating (collecting ranges): LED flashes every five seconds.

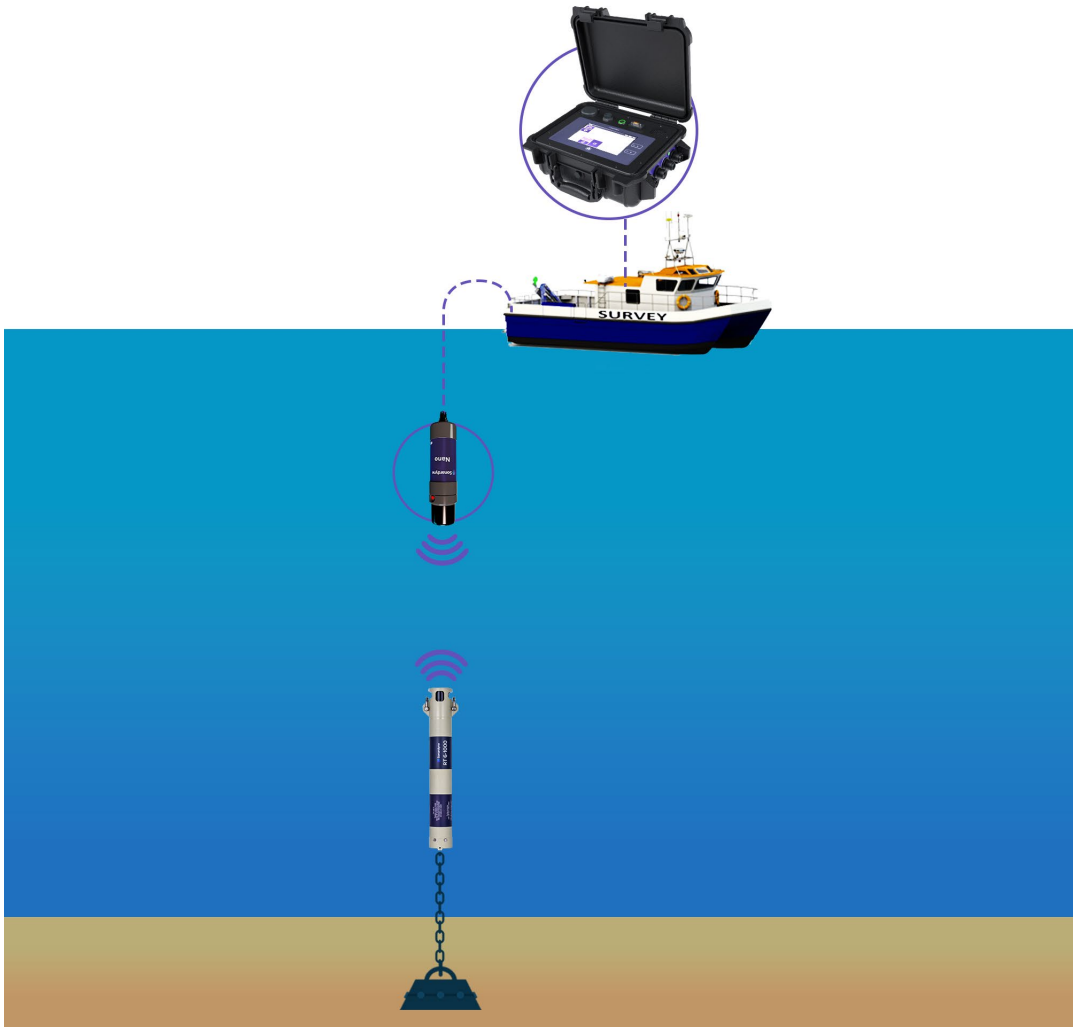
b. After two successful telemetry commands have completed: LED ● changes to solid (the Topside Control RT 6-1000 will continue to collect ranges)

10. When enough ranges have been collected, hold the NFC Android device against the Topside Control RT 6-1000 to automatically retrieve the ranges back to the NFC Android device; if this upload fails, tap **STOP AND GET RANGES** to upload the ranges again.

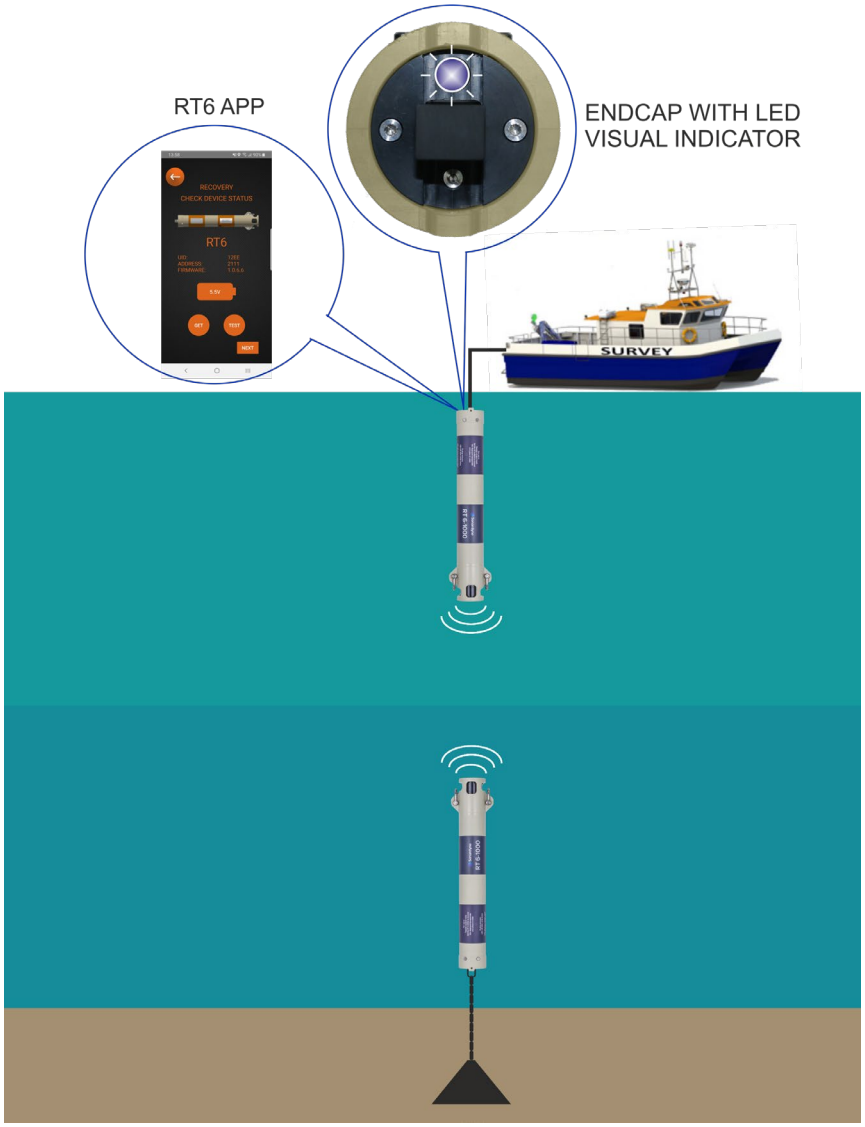
5.3 Releasing a deployed RT 6-1000

A deployed RT 6-1000 can be commanded to release by either using a Deck Topside, an RT 6-1000 (Topside Control) with the RT6 App or using a Ranger 2 system.

The diagram below shows an example of how a deployed RT 6-1000 can be released using a Deck Topside with attached dunker.



The diagram below shows an example of how a deployed RT 6-1000 can be released using another RT 6-1000 which is setup in Topside Control mode by the RT6 App.



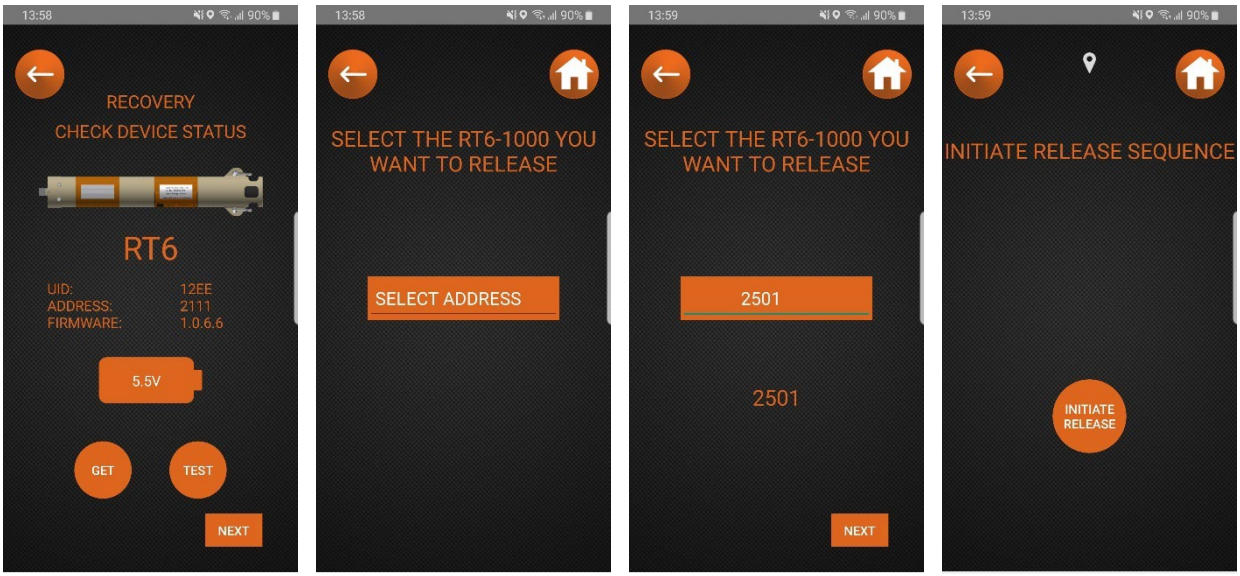
5.3.1 Deck Topside

See *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

5.3.2 RT6 App

1. Secure a suitable rope to the release endcap shackles ready for dunking.
2. Configure the Topside Control RT 6-1000 using the RT6 App.
3. Start the release command; tap **Recover.**
4. Tap **Get** to refresh the information.

5. Tap **Next > Select Address > Initiate Release**.



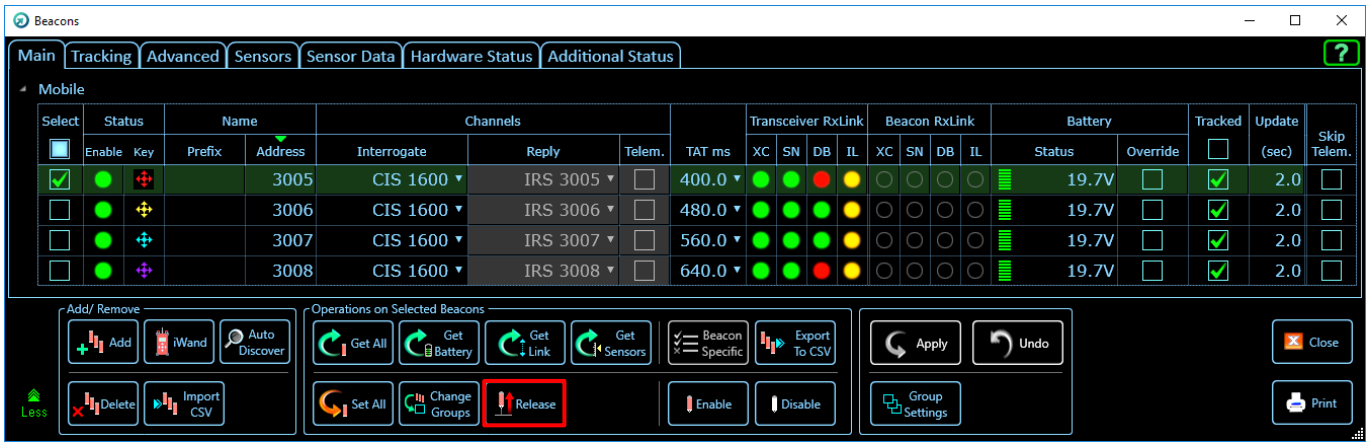
6. Dunk the Topside Control RT 6-1000 over the side of the vessel.
7. The release status is visually displayed by the blue LED on the endcap as follows:
   a. Release nut mechanism operating: LED flashes every five seconds.
   b. Release nut released: LED changes to solid.

Note

It takes approximately 30 seconds for the nut to be released.

5.3.3 Ranger 2

The Release function is located on the Beacons Table, Main tab; see *UM-8251 "Ranger 2 User Manual"* for more information.



5.3.4 Manual commands

The subsea RT 6-1000 can be released using a 6G transceiver without Sonardyne system software by sending manual transceiver commands.

This REL (Release) command is used to activate an acoustic release mechanism. This is done using the REL command and requires the acoustic address **aaaa** and the UID **Uhhhhhh** to be correct. The release can be activated using the actuate parameter, **OPEN** (unload) or **CLOSE** (load).

If the UID is not known this can be retrieved using an **SC:aaaa:TS9** command.

Note

It may be necessary to adjust the transceiver transmit power levels, receiver gain and receiver wait time manually for correct acoustic operation depending on the operating range.

The REL command format is shown in *Table 5-1.*

Table 5-1 REL command fFormat

Command	<REL:aaaa;TS9,Request Release status<REL:aaaa;TS9,Uhhhhhh,[action]	
Reply	>REL:aaaa;Uhhhhhh,[NONE],[status]	
Parameters	aaaa	Address
	U	Unique IDentity (UID)
Input only	action	OPEN - unloads the release nut CLOSE - loads the release nut
Reply only	NONE	Indicates that no release is fitted to the beacon
Reply only	UID_ERR	Indicates that the UID received was in error
Reply only	status	Current status of the release, ACTIVE

Example command and reply:

<REL:2201;TS9,U1BA,OPEN Release beacon 2201

>REL:2201;TS9,U1BC,CMD_ERR,CLOSED Reports a command error because the UID was incorrect

<REL:2201;TS9,U1BC,OPEN Release beacon 2201

>REL:2201;TS9,U0001BC,ACTIVE The release mechanism is now unloading the release nut

5.3.5 Changing transponder address using manual commands

The following manual commands can be used to change the transponder address:

Command	SC:aaaa;TS9,Uhhhhh,ADbbbb (bbbb = new address)
Reply	SC:bbbb,Uhhhhhh

Example command and reply:

<SC:2201;TS9,U1BC,AD2301 Set address to 2301

>SC:2301,U1BC Address change confirmed

5.4 Rope Canister (option)

Rope canister options are available including 70 m, 120 m and 160 m of high strength recovery line; see *Table 10-2*. The longer lengths of line are of a smaller diameter and have a lower acceptable recovery load; these loads are stated on the canisters.

As the RT 6-1000's release is activated, the RT 6-1000, rope canister and flotation rise to the surface deploying the rope from the canister.

Two 3.5 kg upthrust buoys (total of 7 kg), depth-rated to 400 m are provided as part of the assembly.

Note

In high bio-foul areas and/or for long deployment it may be advisable to add additional buoyancy to ensure that if the rope is fouled more force is applied to break the rope out of the canister.

For more information on using the rope canister, see *Appendix A*.

5.5 RT 6-1000 working loads

5.5.1 Working load limit

The Type 8327 RT 6-1000 has a Working Load Limit (WLL) of 150 kg. This is defined as the maximum recommended working load. This is set as a quarter (1/4) of the Breaking Load and allows for factors such as corrosion, fatigue, shock loads, harmonic loads, manufacturing and material variations.

5.5.2 Release load

The RT 6-1000 has a maximum release load of 150 kg for a straight-line pull (side loads will decrease the maximum release load). Note that as the load is released in water, this is normally determined by the maximum up-thrust from buoyancy.

WARNING

The maximum release load of 150 kg only applies if the shaft and nut are coated with underwater grease and the correct battery pack is used.

Note

Strong tides or currents acting on the instrument mooring or sub-surface floats can significantly increase the in-line load due to drag. This has the effect of increasing the release load on the RT 6-1000 and therefore could affect the operation of the unit.

5.5.3 Breaking lad

Testing has shown the RT 6-1000 to have a typical breaking load in excess of 600 kg when new. This is the load that causes structural failure in one or more parts of the assembly causing the load to part from the release mechanism.

5.6 After use

After retrieval from the water, see *Section 6 – Retrieval and storage*.

Section 6 – Retrieval and storage

6.1 Introduction

Before retrieving the transponder, make sure Section 2 – Safety is read and fully understood.

CAUTION

If the transponder is not functioning after retrieval, be aware that it may be pressurised.

6.2 Retrieval

When retrieving from the water, the transponder must be cleaned and inspected before being stored.

1. Clean the RT 6-1000; see *Section 7.3 "Cleaning"*.
2. Inspect the RT 6-1000; see *Section 7.4 "Inspection".*
3. Check and replace the battery if required; see *Section 7.6 "Replacing the battery".*

6.3 Storage

On completion of the checks above, The RT 6-1000 can be placed in storage as described below. See *Table 6-1* for the recommended storage conditions.

WARNING

When transporting and storing, the RT 6-1000 must be disabled (battery electronically disconnected).

1. Disable the RT 6-1000; see *Section 4.3.2 "Disconnecting the battery".*
2. Store the RT 6-1000 in its transit case.
3. Equipment must be kept in a dry, non-condensing atmosphere (20% to 80% humidity), free from corrosive agents and isolated from sources of vibration.
4. It is recommended to visually inspect the equipment at least annually.
5. When equipment is taken from low temperature storage for immediate use its temperature should be raised to normal operating temperature before use.

Table 6-1 Storage conditions

Item	Specification
Storage temperature	-20 to 55°C (*see Notes below*)
Relative humidity	20 to 80% (non-condensing)

Notes

To prolong the life of the battery, it is recommended not to exceed the storage temperature range of 10 to 25°C.

Section 7 – Maintenance

7.1 Introduction

Before any maintenance activity is carried out on the equipment, ensure *Section 2 – Safety* is read and fully understood.

7.2 Retrieving from the water

See *Section 6 – Retrieval and storage*.

7.3 Cleaning

Note

Do not use any abrasive brushes or sharp tools to remove marine growth when cleaning the instrument as this will damage the finish.

1. Thoroughly wash the instrument in warm clean fresh water to remove accumulations of salt, sand/silt and marine growth, paying attention to the pressure relief vent valve.
2. Dry the instrument with a clean lint free cloth.

7.4 Inspection

Regularly inspect the RT 6-1000 for the following:

1. Inspect the pressure relief vent valve; see *Section 3.7 "Pressure relief vent valve"*.
2. Inspect the housing for any signs of mishandling, external damage or leakages.

7.5 Operating the pressure relief vent valve

A pressure relief vent valve is fitted to automatically release any build-up of pressure inside the transponder during deployment. This could be caused by water ingress during deployment and/or the degassing of a battery.

The pressure relief vent valve should be flush with the endcap face. If there is any reason to suspect there may be pressure inside the transponder, or it is not flush with the endcap face, the pressure relief vent valve must be operated as described below.

WARNINGS

Ensure the work environment is well ventilated. Toxic gases and liquids may be released when operating the pressure relief vent valve.

1. Using a suitable tool, carefully withdraw the pressure relief vent valve as far as it will extract and wait for any internal pressure to be released.

Note

Be careful not to damage the valve's surface.



2. After any pressure has been released, push the valve fully back into its recess.

7.6 Replacing the battery

The battery packs can be replaced in the field by a qualified competent person without any specialist equipment. It is important to ensure that a clean and dry environment is available when dismantling the transponder.

WARNINGS

Due to the high internal pressure risk, dismantling the sub-sea equipment must only be carried out by suitably qualified personnel.

If the battery pack has failed or water has penetrated the internal housing, the battery pack may vent gasses causing the build-up of internal pressure.

Risk of toxic gases and liquids. Make sure the work environment is well ventilated. Toxic gases and liquids may be released when operating the pressure relief vent valve.

To replace the battery the transponder must be disabled and then removed from the outer housing and the endcap removed as described in the following sections.

7.6.1 Disable the transponder

Disable the RT 6-1000; see *Section 4.3.2 "Disconnecting the battery".*

Note

If the RT 6-1000 is not disabled, the Sonardyne App may indicate the RT 6-1000 is still enabled after the battery is removed.

7.6.2 Removing the transponder from the housing

1. Before removing the transponder from the housing, operate the pressure relief vent valve to equalise the internal/external pressure; see *Section 7.5 "Operating the pressure relief vent valve"*.

2. Remove the two shackles from the endcap housing (if they are installed), by unscrewing the retaining screws.



3. Using a 3 mm Allen key, unscrew the two M3 retaining screws a few turns to allow the two retaining pins to be removed.



4. Using a thumb and suitable tool, push the two retaining pins out from the outer housing.



5. Carefully slide inner housing completely out of the outer housing.



7.6.3 Removing the endcap

1. Grip the transponder and separate the endcap from the housing with a gentle pulling and side-to-side motion.

CAUTION

Do not over-rotate the endcap when separating the endcap from the housing as this will twist and damage the internal wiring.

2. Carefully remove the endcap from the housing.

CAUTION

The transducer wiring is attached to the internal PCB. Take care not to pull or tension these wires. Ensure the endcap is supported at all times.



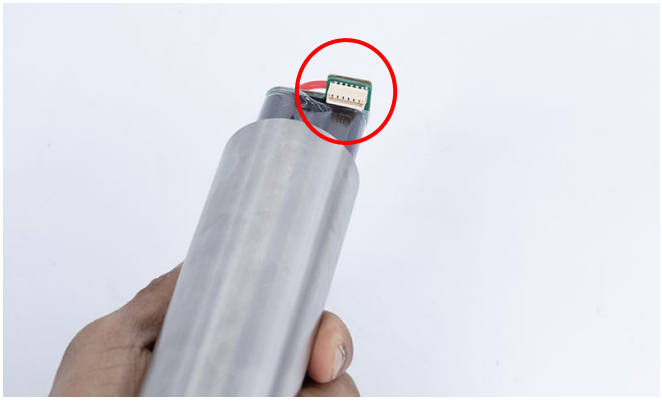
7.6.4 Removing and replacing the battery

1. Support the housing and endcap.
2. Pull down the circular gasket to gain clear access to the connectors and then carefully remove the two connectors.
3. Withdraw the battery pack from the housing using the red pull-cord.



7.6.5 Replacing the endcap

1. Insert the new battery pack into the housing and ensure the battery connector mates to the PCB.



2. Insert the circular rubber gasket against the PCB.
3. Push the endcap fully into the housing ensuring there is no gap between endcap and housing.

Notes

Inspect the O-rings for damage/contamination and replace if necessary.

Use petroleum jelly to lightly lubricate the endcap O-rings if required.

7.6.6 Replacing the transponder into the housing

1. Push the transponder fully into the outer housing until it reaches the retaining flange.
2. Insert the two retaining pins.
3. Using a 3 mm Allen key, tighten the two M3 screws to lock the retaining pins.



4. Replace the two shackles on the endcap housing if required.
5. Check the battery status if required; see *Section 4.4 "Checking the battery".*

Section 8 – Functional testing

8.1 Introduction

To ensure the RT 6-1000 functions correctly, the following functional tests can be carried out:

- Functional self-test
- Range/ping test
- Release test
- Battery check

8.2 Test equipment

Testing of the RT 6-1000 can be performed using the following equipment.

8.2.1 Deck Topside

Deck Topside, either acoustically or with a USB NFC reader; see *UM-8373-Deck Topside "Deck Topside User Manual"* for more information.

8.2.2 NFC enabled Android device

NFC enabled Android device with the Sonardyne RT6 App installed.

8.2.3 iWand handheld test unit

iWand handheld test unit. For information on operating the iWand see *UM-8315 "User Manual for the Type 8315 iWand"*.

8.2.4 NFC Configurator

Sonardyne NFC Configurator Software with a USB NFC reader using a suitable PC; see *QSG-OG-8325 "NFC Configurator Operation Guide"* for more information.

8.3 Functional tests

8.3.1 Transponder test

See *Section 4.5 "Self-test (Quick Check)".*

8.3.2 Range/ping test

8.3.2.1 RT6 App

Tap **Locate > Get > Next > Select Address > Locate/Stop and Get Ranges**.

8.3.2.2 iWand

See *UM-8315 "User Manual for the Type 8315 iWand", Section "Ping Check".*

8.3.3 Release test

See *Section 4.7 "Loading the release mechanism".*

8.3.4 Battery check

See *Section 4.4 "Checking the battery".*

Section 9 – Fault diagnosis

9.1 Introduction

The following section assists in diagnosis when the transponder fails to operate correctly. Each section identifies a fault, the possible cause and the recommended action to rectify the fault.

9.2 Fault types

Fault	Possible cause	Action
NFC device unable to contact transponder	NFC device is not close enough to transponder or held at an incorrect angle	Reposition the NFC device next to the transponder. On the RT6 App tap **Advanced > NFC Optimise Tool** to determine the best position for the Android device.
	NFC device is not working correctly or has locked	Check/restart the NFC device
	RT6 App has locked	Restart the RT6 App
Transponder does not reply to interrogation or commands	Incorrect transponder address set in the Topside Control	Check address and repeat using the correct address
	Operating at long range	Increase transmit power and receive gain to the surface transceiver (Ranger 2)
	Surface thermocline refracting reply signals	Lower transducer below thermocline
	Noise level at surface transducer too high	Lower the dunking transducer.
		Reduce the surface transceiver gain settings (Ranger 2)
	Transponder battery power low	Check battery levels
	Other acoustic systems maybe operating in the same frequency band	
No NFC device available to connect battery	n/a	Enable the RT 6-1000 by disconnecting the battery for >10 seconds and then reconnecting it

Section 10 – Spares

10.1 Introduction

When ordering spare parts, please provide:

a) The part number

b) The drawing number (if known)

c) The description

Enquiries about, or orders for spare parts should be directed to your local Sonardyne office or agent. Local agents contact details can be found on the back cover of this manual and at www.sonardyne.com

10.2 Spares

The following is a list of available spares for the RT 6-1000 and Rope Canister.

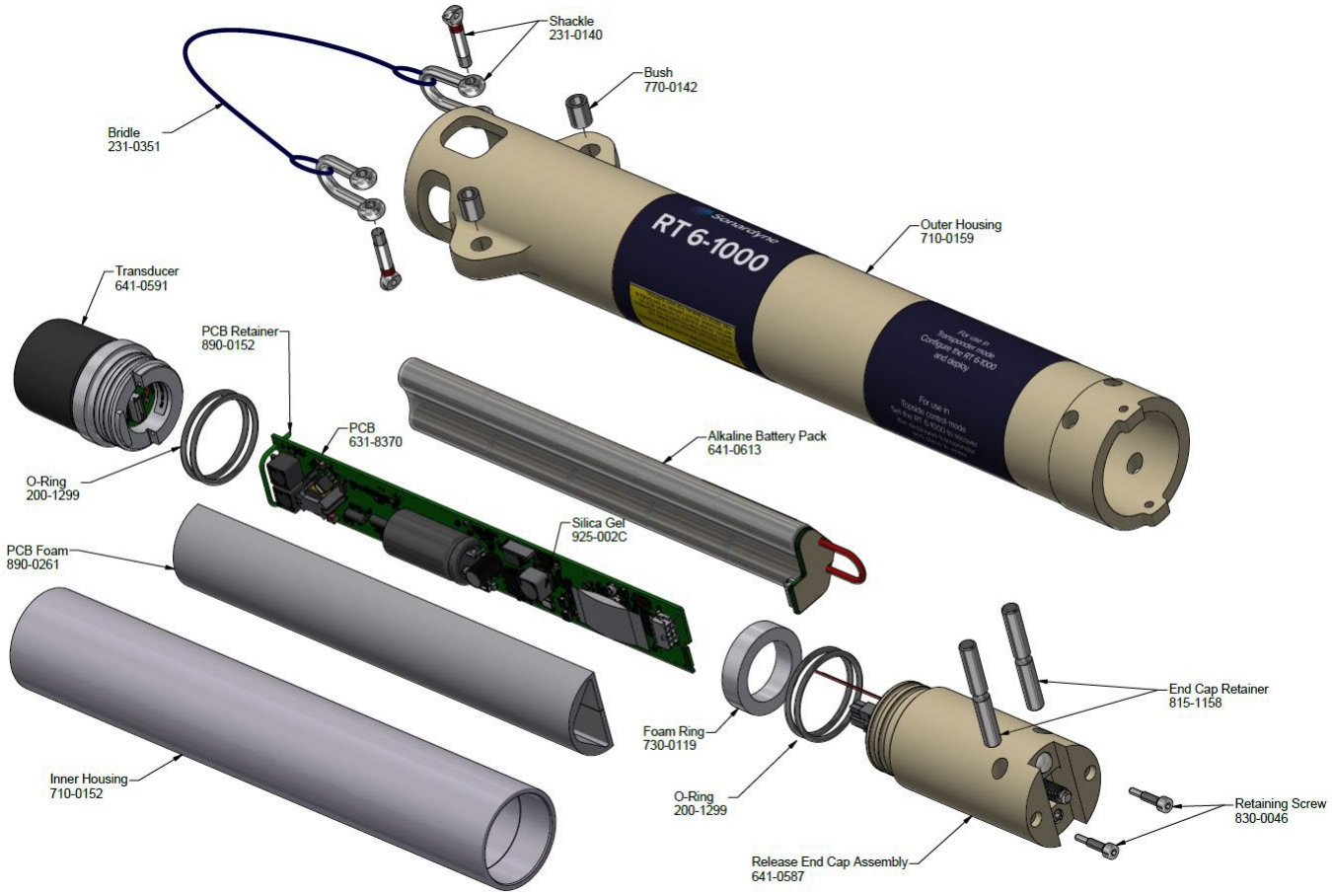


Table 10-1 RT 6-1000 spares

Part number	Description	Number required
641-0613	Alkaline Battery Pack 15 Cell	1
231-0140	Shackle (Bridle)	2
231-0351	Deployment rope (Bridle)	1
770-0142	Shackle Bush	2
231-0010	Shackle	2
830-0048	Release Nut	1
815-1158	Endcap Retainer Pin	2
830-0046	Retaining Screw	2
641-0587	Release Mechanism Endcap Assembly	1
200-1299	O-ring	4
730-0119	Foam Ring	1
631-8370	PCB Assembly	1
925-002C	Silica Gel	1
890-0261	PCB Foam	1
890-0152	PCB Retainer	1
710-0152	Inner Housing	1
710-0159	Outer Housing	1
641-0591	Transducer Assembly	1

Table 10-2 Rope Canister spares

Part number	Description	Quantity
641-0673	Rope Canister Accessory Kit 70 m	1
641-3265	Rope Canister Accessory Kit 120 m	1
641-0080	Rope Canister Accessory Kit 160 m	1
231-0348	Replacement 70 m rope (250 kg)	1
231-0350	Replacement 120 m rope (250 kg)	1
641-0074	Replacement 160 m rope (125 kg)	1

Section 11 – Technical specifications

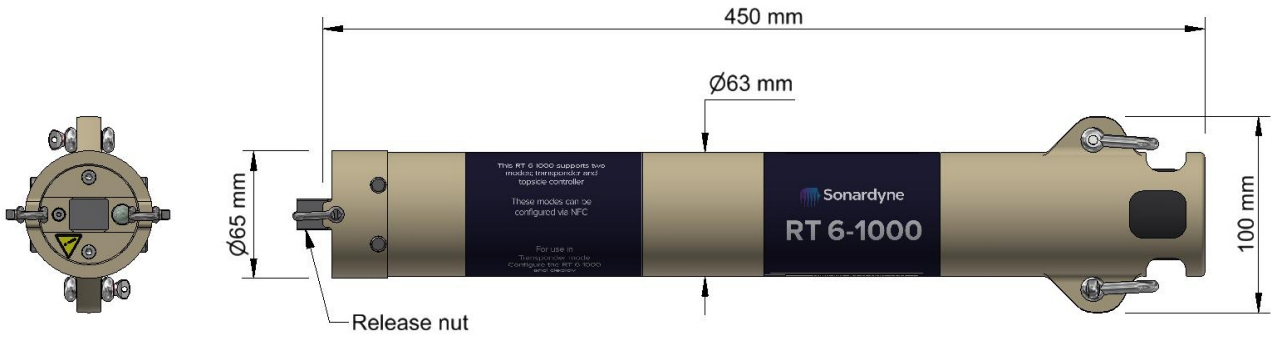
Feature		Type 8327
Depth Rating		1,000 m
Operating Frequency		MF 19–34 kHz
Transducer Beam Shape		Hemispherical
Transmit Source Level (dB re 1 µPa @ 1 m)		187 dB
Tone Equivalent Energy (TEE)[1]		193 dB
Receive Threshold (dB re 1 µPa)		<100 dB
Working Load Limit (4:1)		150 kg
Proof Load[2]		300 kg
Breaking Load		600 kg
Maximum Safe Release Load		150 kg
Battery Life (Alkaline)		>13 months
Inclinometer Accuracy		±5°
Surface Unit		Deck Topside, Ranger 2 USBL, RT 6 Android™ App
Mechanical Construction		Anodised aluminium alloy, plastic and super duplex stainless steel
Operating Temperature		-5 to 40ºC
Storage Temperature		-20 to 55ºC
Maximum Dimensions (Length x Diameter)		450 x 65 mm
Weight in Air/Water[3]		2.0/0.5 kg
Standards		CE Marked to EN-60945, EN-61010
Options		**Part number**
Shallow Water Deck Kit (Deck Topside)		602-0175
Rope Canister	70 m (250 kg WLL)	641-0673
	120 m (250 kg WLL)	641-3265
	160 m (125 kg WLL)	641-0080
Release Nut		830-0048 (note: 10 nuts supplied with each new RT 6-1000)

[1] WBv2+ signals are 4x the duration of Sonardyne tone signals (WBv1 & WBv2 are 2x). The TEE figure shows the operational performance when comparing wideband and tone systems.
[2] Sonardyne does not perform proof load testing of this product.
[3] Estimated Weights.

11.1 Outline drawings

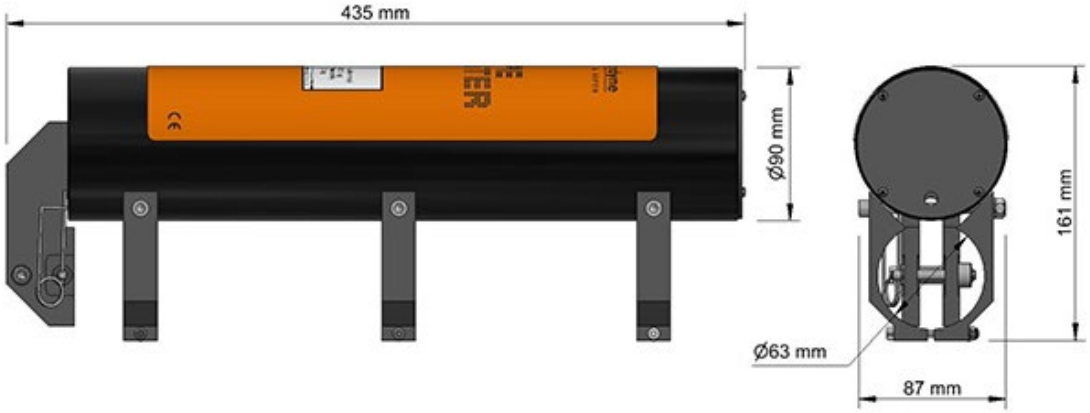
11.1.1 RT 6-1000

Figure 11-1 Type 8327 dimensions

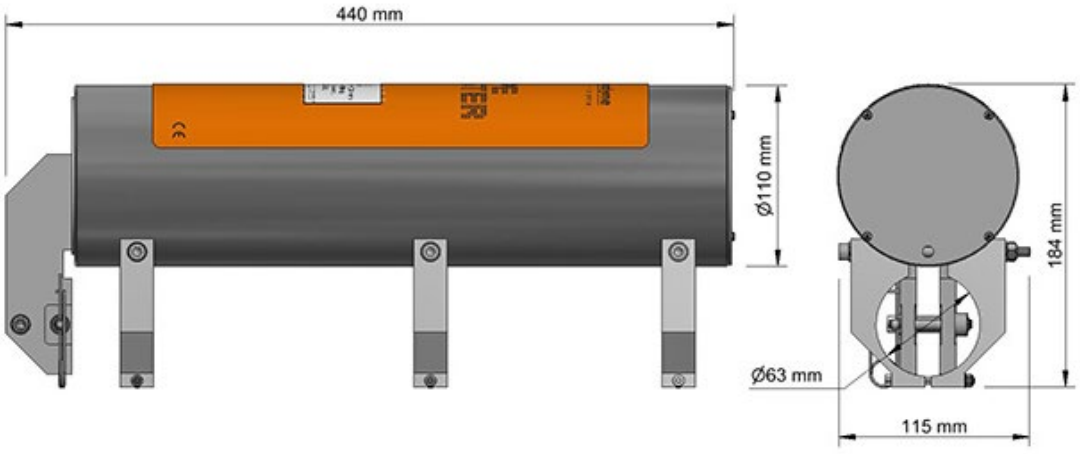


11.1.2 Rope Canister

11.1.2.1 70 m



11.1.2.2 120 and 160 m



Appendix A – Rope Canister

A.1 Introduction

The rope canister is typically used to retrieve heavy subsea structures e.g., an ADCP frame by means of an attached rope that is brought up to the surface using attached flotation buoys when the RT 6-1000 releases it.

Figure A-1 RT 6-1000 with Rope Canister attached



The rope canister is available to purchase as a separate kit. The 70 m rope canister kit (650-1602) is shown below.

Figure A-2 Rope Canister 70 m kit

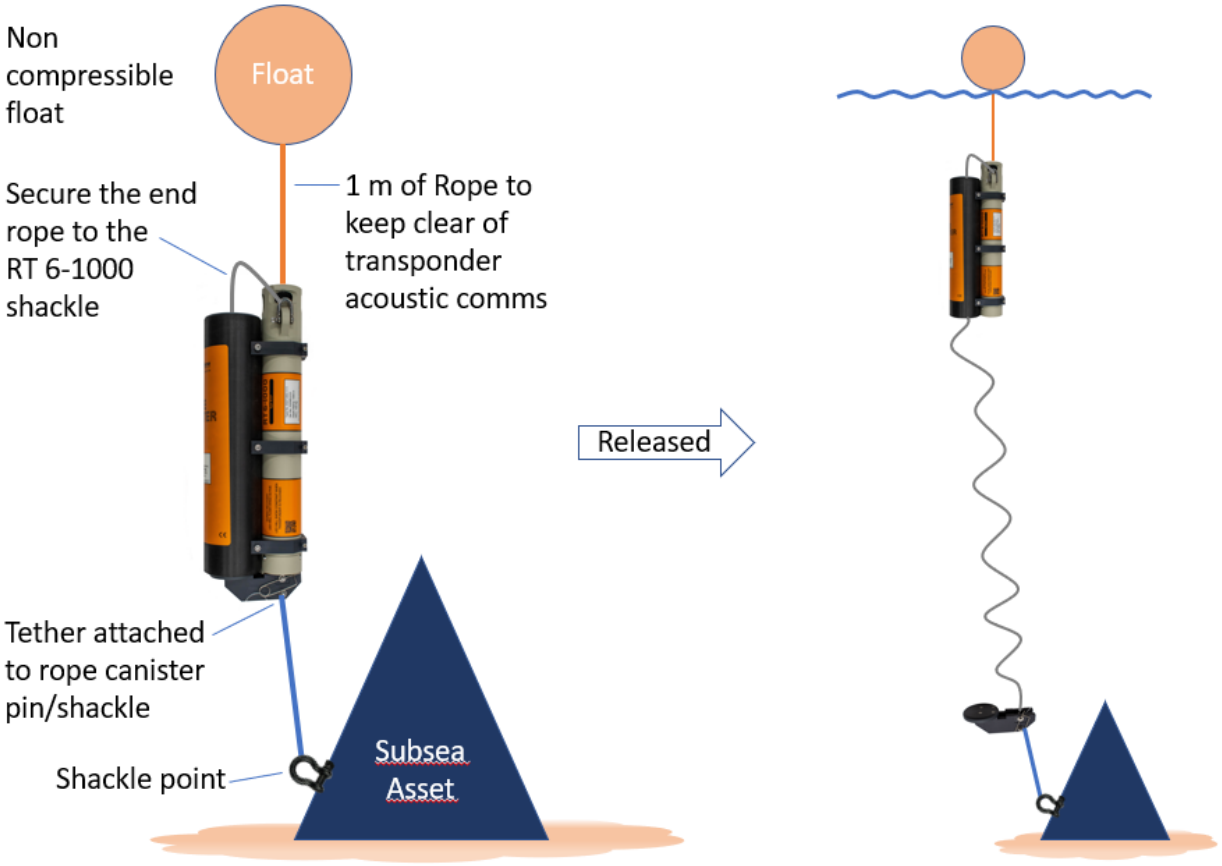


A.2 Deployment methods

There are typically two methods of deploying the RT 6-1000 and rope canister, which are described below (method 1 is the preferred method; see *Section A.2.1*).

A.2.1 Method 1: RT 6-1000 and Rope Canister not attached to subsea structure (preferred method)

The RT 6-1000 and rope canister are positioned vertically on the seabed and are not attached to the subsea asset. When released the flotation buoy will bring the RT 6-1000 and rope canister to the surface whilst spooling out rope. The subsea asset can then be retrieved by means of the rope.

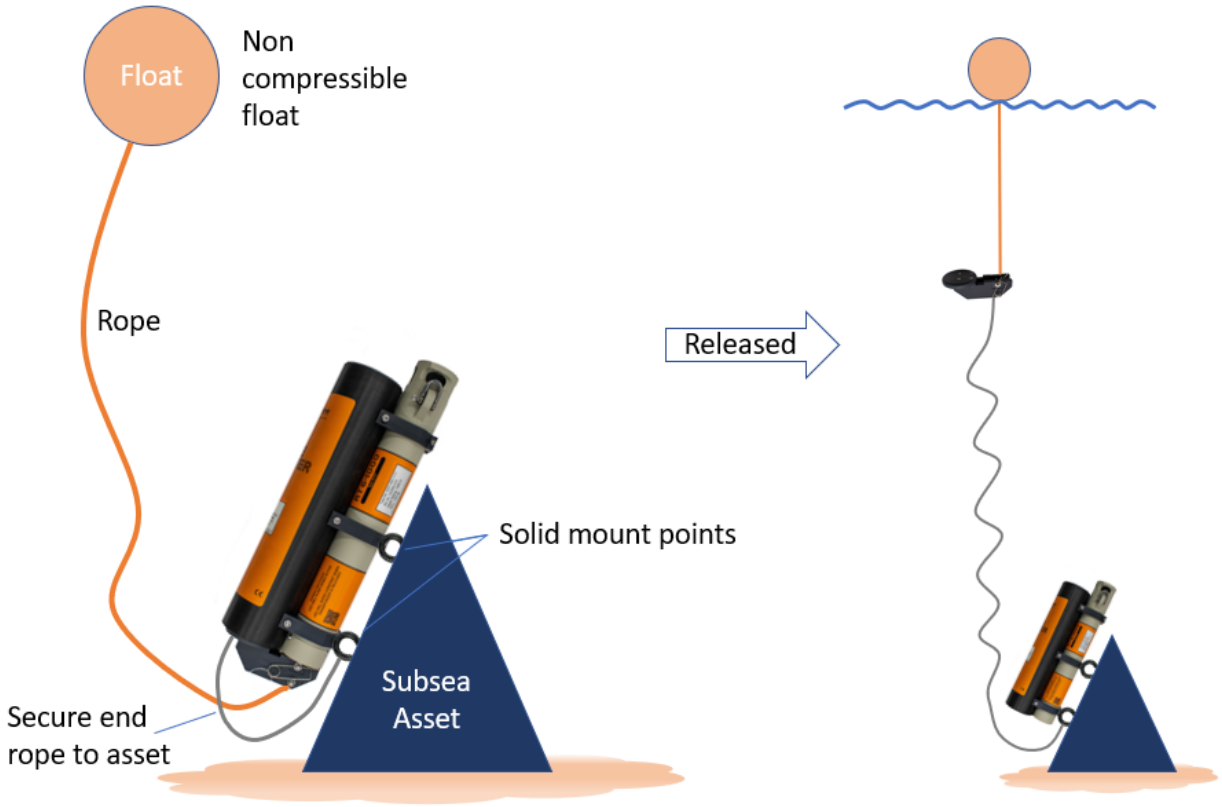


The advantages and disadvantages of this method are shown below:

Advantages	Disadvantages
Rope will spool more efficiently so is less likely to get dragged out by tidal flow as it ascends	Cannot position the subsea structure after transponder is released
Less likely to lose the transponder while recovering the asset	Flotation buoy can block acoustic transducer if mounted too close.
If the current holds the transponder underwater the user will have confidence the release functioned correctly its position will change. The transponder can then be retrieved after waiting for slack water	Larger object so more possibility to drift in tidal flow

A.2.2 Method 2: RT 6-1000 and Rope Canister attached to subsea structure

The RT 6-1000 and rope canister are fixed to the structure. When released the flotation buoy brings the rope end to the surface leaving the RT 6-1000 and rope canister on the seabed. The subsea structure together with the RT 6-1000 and rope canister can then be retrieved by means of the rope.



The advantages and disadvantages of this method are shown below:

Advantages	Disadvantages
Structure can still be tracked if the rope detaches	Flotation buoy can drift off in the tidal flow as it ascends dragging a long length of rope.
Less buoyancy required	Risk of transponder being damaged during recovery while dragging a large asset
	More complex buoy release method and risk of entanglement

A.3 Rope Canister options

The rope canister options include: 70 m, 120 m and 160 m of high strength recovery line. The longer lengths of line are of a smaller diameter and have a lower acceptable recovery load, these loads are stated on the canisters.

Two 3.5 kg up-thrust buoys (total of 8.4 kg), rated to 400 m are provided as part of the assembly.

Note

In high bio-foul areas and/or for long deployment it may be advisable to add additional buoyancy to ensure that if the rope is fouled more force is applied to break the rope out of the canister.

The rope canister can be purchased separately from the RT 6-1000 and can be fitted in the field.

A.4 Using the Rope Canister

A.4.1 Attaching the Rope Canister

Decide the method to be used to deploy the RT 6-1000 and rope canister; see *Section A.2*, and then:

1. Attach the rope canister to the RT 6-1000 using the three clamps.

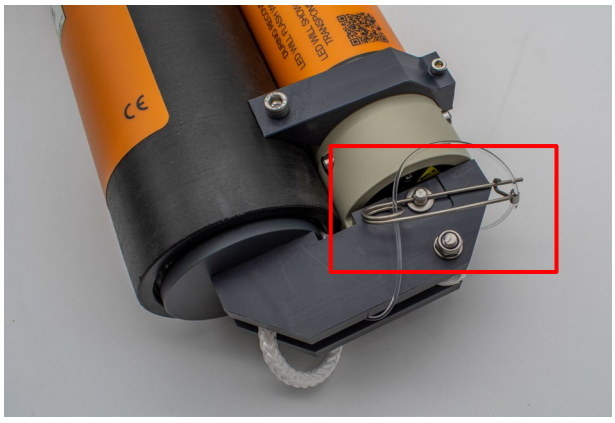


2. If the rope canister has not been packed with rope, it must be packed as described in *Section A.5.*

Note

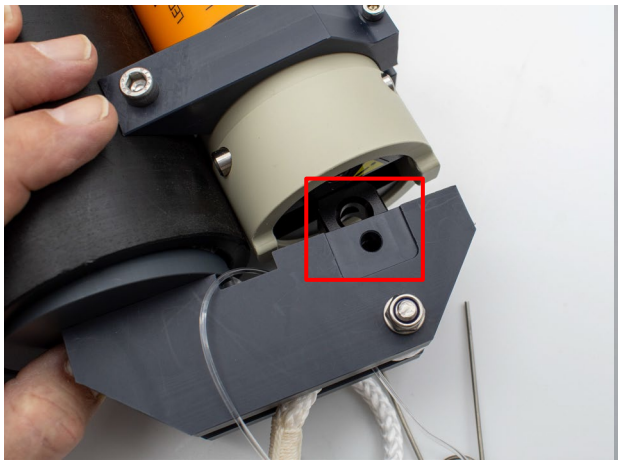
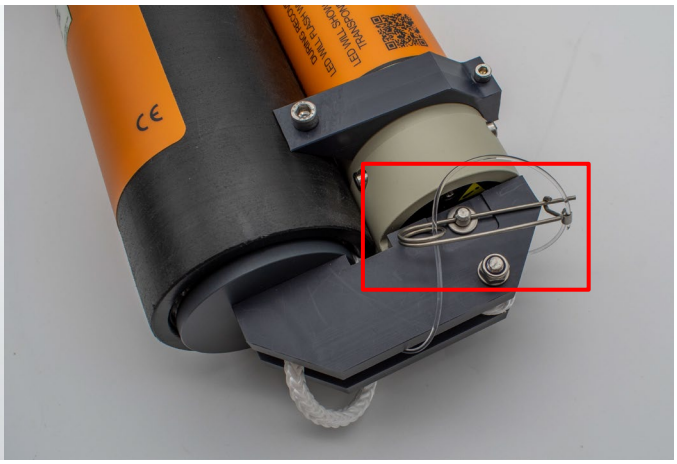
If deploying using method 2, the rope must be packed with the rope end existing the endcap end; see *Section A.5 "Reloading the canister after use".*

3. Remove the clip and pin holding the nut into the rope canister assembly as shown below and then remove the assembly taking care to keep the rope intact inside the canister.



4. Load the release nut onto the RT 6-1000 as detailed in *Section 4.7.5* (ensure the correct orientation of the nut).

5. Re-attach the assembly onto the nut and replace the pin and clip.

6. Pass the rope through the centre of the assembly behind the pin (or attached shackle if preferred).




7. Attach a rope from the flotation buoys to the top of the RT 6-1000 or the bottom of the rope canister, depending on the deployment method being used; see *Section A.2*.
8. Secure the rope end depending on the deployment method:
   a. Method 1: Secure the rope end from the end of the rope canister to the RT 6-1000 shackle.



b. Method 2: Secure the rope end from the endcap end of the rope canister to the subsea asset.

Note

Ensure the rope end is long enough to secure to the asset after the rope canister assembly is secured in place.



9. The rope canister/RT 6-1000 is now ready for deploying.

A.4.2 Releasing and retrieving the rope

When the RT 6-1000 is released the rope is deployed from the canister as shown below.



The flotation buoy will bring the rope to the surface either with or without the RT 6-1000 (depending on the deployment method; see *Section A.2*).

The subsea structure can then be retrieved using the attached rope.

Notes

The rating of the rope is degraded by long-term exposure to UV light.

After use in the sea ensure that the rope is washed through with fresh water and then repacked.

A.5 Reloading the canister after use

The rope should be packed into the canister specifically for the deployment method being used, using a suitable packing rod with a smooth end (the end of a broom handle can be used for this purpose):

A.5.1 Reloading for method 1 deployment

1. Coil the rope into the canister a few layers at a time, each time packing down the coils hard with a suitable 'rod'.
2. The rope must be packed tightly to fit the full amount of rope into the canister.

Note

120 m & 160 m canisters do not need as much "packing down" of the rope as the 70 m canister due to the larger canister area and smaller rope diameter.

3. Ensure that there are no knots or snags in the rope, as these will reduce the Safe Working Load rating.
4. Leave approximately 200 mm of rope free from the canister.

Note

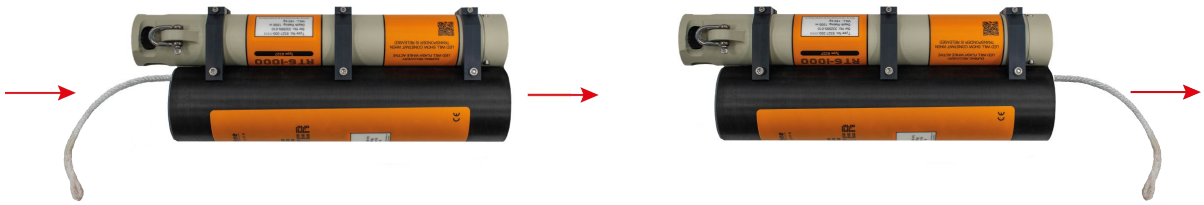
In high water current environments it is recommended to tie a suitable stop like a cable tie approx 200 mm from the end of the rope so it sits inside the canister (as shown in red below). This will ensure the rope cannot be pulled out by the water current before deployment.



5. Ensure that the rope is always terminated with a figure-of-8 loop or a spliced eye (under high loads the rope becomes slippery and a bow-line knot etc can slip causing the load to part).

A.5.2 Reloading for method 2 deployment

1. Pull the rope end that exits through the base of the canister through the canister and out of the endcap end (pull out enough rope to allow it to be secured to the asset when the rope canister assembly is secured in place).



2. Coil the remaining rope into the canister a few layers at a time, each time packing down the coils hard with a suitable 'rod'.
3. The rope must be packed tightly to fit the full amount of rope into the canister.

Note

120 m & 160 m canisters do not need as much "packing down" of the rope as the 70 m canister due to the larger canister area and smaller rope diameter.

4. Ensure that there are no knots or snags in the rope, as these will reduce the Safe Working Load rating.
5. Leave approximately 200 mm of rope free from the canister.

Note

In high water current environments it is recommended to tie a suitable stop like a cable tie approx 200 mm from the end of the rope so it sits inside the canister (as shown in red below). This will ensure the rope cannot be pulled out by the water current before deployment.



6. Ensure that the rope is always terminated with a figure-of-8 loop or a spliced eye (under high loads the rope becomes slippery and a bow-line knot etc can slip causing the load to part).

Appendix B – Licence notices and terms

The following software is used with this product.

B.1 Open-source software licence notices and terms

B.1.1 Atmel Software Framework V3.28.0

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B.2 Other licence notices and terms

B.2.1 Sonardyne NFC App

The Sonardyne NFC App is issued for use subject to licensing terms under (1) Google Play™ terms of service and (2) Sonardyne Mobile Application End-User Licence Agreement.

Definitions

Term	Definition
6G®	Sonardyne's sixth generation technology hardware platform.
Acoustic Signal	Information carried by sound pressure waves through water. The Sonardyne acoustic signal has a finite length.
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.
Breaking Load	The load that induces structural failure in one or more parts or the instrument, causing the load to part from the release mechanism.
Competent Person	A competent person is an individual who, by way of training and/or experience, is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer or responsible body and has authority to take appropriate actions.
Deck Topside	Deck Topside provides a portable command and control interface to Sonardyne instrumentation and with the use of the installed apps and allows Sonardyne equipment to be configured and operated safely on the deck of a boat. Deck Topside can be used to release any suitably equipped transponder and initiate an IT 6 transponder
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
iWand	The iWand is a hand-held acoustic transponder test and configuration device developed for use with Sonardyne's 6G instruments.
LED	Light Emitting Diode
MF	Medium Frequency (19–34 kHz)
NFC	Near Field Communications
PC	Personal Computer
PCB	Printed Circuit Board
Proof Load	The load to which the actual unit has been tested in the factory. This load should be periodically applied to demonstrate that the unit is still in a safe condition. This is usually twice the WLL.
Release Load	The maximum in-line load the instrument can withstand and successfully release without overloading any part of the release mechanism or demanding an unsupportable quantity of energy from the battery supply (at its specified end point).
Safe Working Load	The maximum load (as determined by a competent person) that an item of lifting equipment may raise, lower or suspend under particular service conditions, eg, the SWL can be lower than, but can never exceed, the WLL.
Sonardyne	Sonardyne International Limited and its affiliates.
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.
UID	A unique 24-bit address electronically coded into the firmware. It is denoted by 6 hexadecimal characters.

Term	Definition
WLL	Working Load Limit. The Working Load Limit (WLL) is the maximum recommended working load. This is set as a maximum 25% of the Breaking Load and allows for factors such as corrosion, fatigue, shock loads, harmonic loads, manufacturing defects and material defects. This does not account for extreme offshore service conditions.

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