

UTS-9500 Universal Topside

User's Manual

P/N M310953-NFC, Rev. A



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Refer to the applicable parts of this instruction manual before connecting and operating the UTS-9500 Universal Topside.



Preface

Congratulations on your purchase of a Teledyne Benthos UTS-9500 Universal Topside! This next generation surface control unit operates with all of the Teledyne Benthos acoustic releases, transponders and acoustic telemetry modems. In addition, the topside operates with EdgeTech, University of Rhode Island (URI) and GeoPro acoustic releases. The topside employs the same digital processing technology used in the acoustic telemetry modems for reliable wireless digital communications underwater.

This manual provides information on setting up and operating the UTS-9500 Universal Topside. It is divided into the following seven sections:

Section 1 - Overview reviews the operational features, the operator functions and the external connections provided by the UTS-9500 Universal Topside.

Section 2 - Specifications lists the specifications for the UTS-9500 Universal Topside.

Section 3 - Installation and Setup provides instructions on how to unpack the UTS-9500 Universal Topside and make the required connections.

Section 4 - Using the Touch Screen Display provides instructions on how to operate all the functions of the UTS-9500 Universal Topside using the touch screen display, including acquiring and displaying ranges and sending commands.

Section 5 - Care and Maintenance provides recommended care and maintenance procedures and procedures for calibrating the touch screen display, updating the firmware and factory resetting the UTS-9500 Universal Topside.

Section 6 - Detailed Views provides detailed outline drawings of the UTS-9500 Universal Topside and the transducer types.

Section 7 - Accessories and Part Number Designator provides a list of UTS-9500 Universal Topside accessories and a part number designator which provides an easy method for designating the specific part number for a UTS-9500 Universal Topside when placing an order.

Section 8 - Safety provides separate lists of all of the specific warnings and cautions appearing in this manual in the order of appearance.

Appendix A - Declaration of Conformance provides a statement declaring the conformance of the UTS-9500 Universal Topside and its user's manual to the requirements for CE marking.

Notes, Warnings and Cautions

Where applicable, special notes, warnings and cautions are presented as follows:



NOTE Recommendations or general information that is particular to the material being presented; a referral to another part of this manual or to another reference; or general information applicable to the UTS-9500 Universal Topside.



WARNING Identifies a potential hazard that could result in injury or death to the operator or to other personnel.



CAUTION Identifies a potential hazard that could result in damage to equipment or loss of data.

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We welcome your comments and suggestions for improving our products and documentation as well as developing better ways of serving you with acoustic technology. Therefore, please contact Customer Service should you have any comments or suggestions about this manual or the UTS-9500 Universal Topside, or if you require service or support.

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1 Overview

The Teledyne Benthos UTS-9500 Universal Topside is an all-purpose portable surface control unit that acoustically communicates with any of the Teledyne Benthos acoustic releases, transponders and acoustic telemetry modems. The UTS-9500 is shown in Figure 1-1.

General Description

The topside can send commands, acquire and display ranges to and check the status of any Teledyne Benthos acoustic release, acoustic telemetry modem or acoustic transponder. In addition, the UTS-9500 can transmit data to and receive data from any of these remote devices and send the wakeup signal to wake up Compact Modems and R Series Releases. The UTS-9500 can also operate releases provided by EdgeTech/EG&G, the University of Rhode Island (URI) and GeoPro.



Figure 1-1 The UTS-9500 Universal Topside

Types and Configurations

Three types of the UTS-9500 Universal Topsides are available.

UTS-9500M Universal Topside. A multi-receive topside that can receive any frequency simultaneously in 250-Hz increments within its specific frequency band. This feature enables operation in a long baseline (LBL) acoustic positioning system.

UTS-9500E Universal Topside. A topside that has the same features as the UTS-9500M Universal Topside but can receive only one selectable frequency at a time in 250-Hz increments within its specific frequency band. This single receive capability precludes its use in a LBL system, and therefore results in a less restrictive export classification.

UTS-9500A Universal Topside. A topside that has the same features as the UTS-9500E Universal Topside but without acoustic telemetry capability. The UTS-9500A can only be used to send and receive acoustic commands and therefore carries the least restrictive export classification. For more information refer to the UTS-9500A Universal Topside User's manual.

The UTS-9500 Universal Topside is contained in an impact resistant case with a splashproof front panel. The front panel includes a color touch screen display, operator controls, connectors for making all of the external connections, a speaker, and two vent plugs. This manual is also included as a PDF on a USB flash drive inside the case.

The UTS-9500 Universal Topside includes the following components:

- ***UTS-9500M or UTS-9500E Universal Topside***
- ***Transducer***
- ***Transducer cable***
- ***Accessories case***
- ***AC power cord***
- ***USB flash drive with a PDF copy of this manual***

Optional Features

A number of factory installed optional features as listed below are available for the UTS-9500 Universal Topside. Contact Teledyne Benthos for more information or to order any one or more of these features.

Global Navigation Satellite System (GNSS). The Global Navigation Satellite System (GNSS) option comprises navigation firmware and a compact GNSS receiver module that connects to the topside and supports GPS, GLONASS, Galileo, and BeiDou satellite systems. Having access to multiple satellite systems ensures improved accuracy, redundancy and availability. Instead of the provided GNSS receiver module, any navigation device that supports NMEA strings, such as GGA, GLL or RMC for location, ZDA for date, and GSV for satellite status can be connected. An appropriate USB-to-serial adapter may be required. Once activated the GNSS Status indicator on the Status and Control Bar of the UTS-9500 touch screen display indicates the GNSS activity. In addition, a GNSS selection appears on the Navigation menu through which all GNSS functions may be accessed. An extender cable is also included which provides an IP-65 rated connector on the topside end.

PSK Coprocessor. The PSK Coprocessor option adds a coprocessor to the topside, enabling it to receive PSK modulated data over the acoustic link at bit rates as high as 15,360 bits/sec.

Waveform Play. The Waveform Play option is a firmware only feature which requires the installation of a feature key to enable it. This feature enables transmission of waveforms using the transmitter and the transducer of the UTS-9500. It requires that base banded waveforms be built using an external program and loaded into the topside's memory.

Operating Frequency Bands

The topside is configured to operate in the wide low frequency 7–16 kHz (WLF), medium frequency 16–21 kHz (MF) or 22–27 kHz (Band C) band. Refer to Section 7, "Accessories and Part Number Designator," to determine the operating frequency band of the topside based on its part number.

Transducer

The topside includes one of three available transducers:

LF/Release Band:	Low frequency transducer that operates in the 7–16 kHz frequency band. Available in an omnidirectional or directional configuration.
MF:	Medium frequency transducer that operates in the 16–21 kHz frequency band. Available in an omnidirectional or directional configuration.
Band C:	Medium-high frequency transducer that operates in the 22–27 kHz frequency band.

Transducer Cable

The included transducer cable is 25 m (82 ft) long. Optionally available lengths are 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), and 200 m (656 ft).

Accessories Case

The accessories case contains the transducer, the transducer cable and the AC power cord.

Operation

A color touch screen display on the front panel of the topside enables local control of all the topside functions and the display of status and data. The topside can also be operated remotely from a PC.

Power Requirements

The topside can be powered externally from AC power or internally from its rechargeable battery. Conversion to internal power is automatic when external power is removed, and the battery recharges automatically when external power is connected. In addition, the topside can be operated while the battery is being charged.

External Connections

The topside provides for the connection of external components, which include the transducer, a USB flash drive or the optional GNSS, and a PC. The PC connection allows commands and data to be sent and received.

Operator Functions

All of the topside operator functions are provided on the front panel which is shown in Figure 1-2. A touch screen display displays data and enables operator input and control, provides audio outputs to the speaker, including a beep when a touch screen display control is touched or an error occurs, as well as other audio indications. The operator functions include the following:



ON/OFF switch. Turns the topside on or off. The switch is spring loaded to return to the neutral up position after switching on or off.



Speaker. Provides an audio verification of transmitted and received data, pings and replies.



Vent ports. Allow pressure relief during charging without ingressing water.

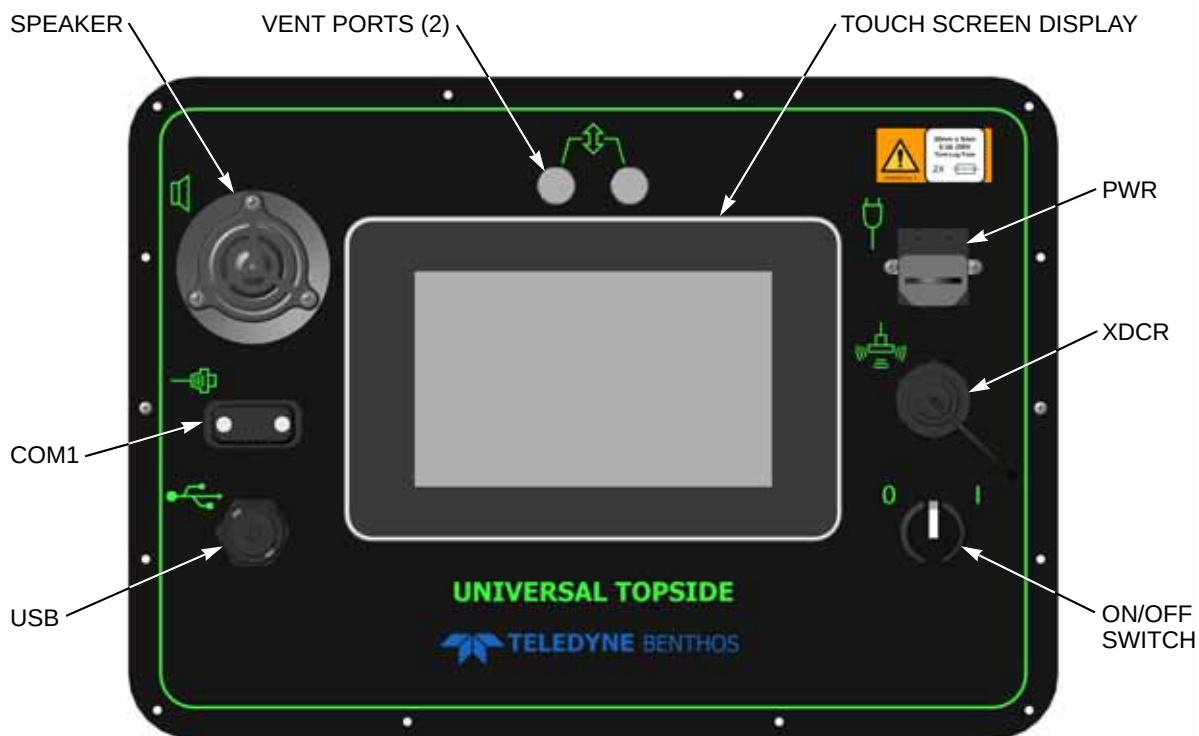


Figure 1-2 UTS-9500 Universal Topside Operator Functions and Connections

Connections

All of the connections to the topside are made on the front panel which is shown in Figure 1-2. They are the following:

-  **PWR.** 3 pin IEC-320-C14 style fused connector—connects to the AC power source.
-  **XDCR.** 5-pin bulkhead connector—connects to the transducer.
-  **USB.** Type A USB connector—connects either to a USB flash drive for updating system firmware and transferring data and log files or to the optional GNSS.
-  **COM1.** DB-9S connector—female serial port connector that connects to a PC and is used for sending and receiving acoustic telemetry modem commands and data.

2 Specifications

This section provides specifications for the UTS-9500 Universal Topside. All specifications are subject to change without notification.

General

Serial interface: RS-232/422 (COM1)

Acoustic Telemetry Modem

Frequency band: 8.96–14.08 kHz (LF), 16.00–21.12 kHz (MF) or 22.56–27.68 kHz (Band C)

Data modulation: PSK, MFSK and FH

Bit rate: 80 bits/sec (FH transmit and receive); 140–2400 bits/sec (MFSK transmit and receive); 2560–15,360 bits/sec (PSK transmit and receive), consult factory

Addressable modems: 250

Processing features: Data redundancy
1/2 rate convolutional coding
Multipath guard period

Transponder

Frequency band: 7–16 kHz (LF), in 250-Hz steps

Receive frequencies: Multi-receive all frequencies across band

FSK commands: A–M

Transmit pulse width: 5.0–15.0 ms, user selectable

Receive pulse width: 5.0–15.0 ms, user selectable

Turn around time: 0.0–200.0 ms, user selectable

Timeout: 2.0–99.5 s, user selectable

Ping lockout: 0.0–1500.0 ms, user selectable

Environmental

Temperature, operating:	-10°C–50°C (14°F–122°F)
Temperature, nonoperating:	-20°C–60°C (-4°F–140°F)
Temperature, charging:	0°C–50°C (-32°F–122°F)
Environmental testing:	ISTA 2A Fixed Displacement Vibration and shock (drop)
IP rating:	IP67, with topside cover closed IP65, <i>nonoperating</i> with topside cover open and connector covers not installed IP65, <i>operating</i> with the transducer cable connected and the remaining connector covers installed

Physical Characteristics

Case construction:	Polypropylene based resin, injected molded
Case type:	Splashproof with cover open; waterproof to 1 m of water depth for up to 30 minutes with cover closed and latched
Dimensions (topside case):	42.4 cm (16.7 in.) wide by 34.0 cm (13.4 in.) deep by 17.3 cm (6.8 in.) high
Dimensions (accessories case):	47.5 cm (18.7 in.) wide by 37.6 cm (14.8 in.) deep by 17.8 cm (7.0 in.) high
Weight (topside case):	7.8 kg (17.2 lb)
Weight (accessories case):	10.8 kg (23.7 lb) with transducer, 25-meter transducer cable and AC power cord



NOTE Although the topside is ruggedly constructed of impact resistant material, it is not designed to be used as a shipping container. Be sure to pack the topside in a suitable container when shipping it.

Power Requirements

AC input power:	100–240 VAC, 2–5 A, 47–63 Hz
Battery:	1 internal Li-Ion rechargeable 28.8 V, 2.5 A·h battery
AC power cord length:	1.8 m (6 ft); IEC-320-C13 to NEMA 5-15R connectors
Battery life:	8 hours of active time typical, depending on usage, where active time includes commands, wakeups, etc.
Charge time:	3–4 hours typical



NOTE A user supplied cable may be substituted for the AC power cord if it meets the stated power requirements and includes an IEC-320-C13 connector.



NOTE To prevent premature depletion of battery capacity, follow the recommendations for charging the battery and storing the topside as described in "Battery Maintenance and Charging" on page 5-2.



WARNING *Always* connect the power cord to the topside *before* connecting it to the power source, whether it is for operating the topside or charging its battery. Not connecting the power cord in this manner could result in an electrical shock.



WARNING *Always* disconnect the power cord from the power source *before* disconnecting it from the topside. Not disconnecting the power cord in this manner could result in an electrical shock.

Input/Output

Operator functions:	Power switch Touch screen display
Displays and indicators:	Touch screen display Speaker
External connections:	Power Transducer COM1 serial port USB

Transducer

The available transducers are release band (LF) and medium frequency (MF) in both an omnidirectional and a directional configuration, and a Band C.

LF/Release Band Transducer—Omni

Transducer cable length:	25 m (82 ft) standard; 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), or 200 m (656 ft) optional
Frequency band:	7–16 kHz
Source level:	185 (± 6 dB) dB re 1 μ Pa @ 1m typical
Preamp gain:	30 dB
Radiation pattern:	Toroidal $\pm 40^\circ$ @ 12 kHz typical
Housing construction:	Delrin
Guard construction:	316 stainless steel
Dimensions:	14.0 cm (5.5 in.) max diameter by 25.9 cm (10.2 in.) long
Weight in air:	5.4 kg (11.9 lb)
Weight in water:	3.7 kg (8.2 lb)
Operating depth:	300 m (984 ft)

Medium Frequency (MF) Transducer—Omni

Transducer cable length:	25 m (82 ft) standard; 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), or 200 m (656 ft) optional
Frequency band:	16–21 kHz
Source level:	183 (± 6 dB) dB re 1 μ Pa @ 1m typical
Preamp gain:	30 dB
Radiation pattern:	Toroidal $\pm 40^\circ$ @ 18 kHz typical
Housing construction:	Delrin
Guard construction:	316 stainless steel
Dimensions:	14.0 cm (5.5 in.) max diameter by 25.9 cm (10.2 in.) long
Weight in air:	3.4 kg (7.6 lb)
Weight in water:	2.3 kg (5.0 lb)
Operating depth:	300 m (984 ft)

LF/Release Band Transducer—Directional

Transducer cable length:	25 m (82 ft) standard; 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), or 200 m (656 ft) optional
Frequency band:	9–14 kHz
Source level:	190 (± 6 dB) dB re 1 μ Pa @ 1m typical
Preamp gain:	30 dB
Radiation pattern:	Toroidal $\pm 30^\circ$ @ 12 kHz typical
Housing construction:	Delrin
Guard construction:	316 stainless steel
Dimensions:	14.0 cm (5.5 in.) max diameter by 30.9 cm (12.2 in.) long
Weight in air:	5.6 kg (12.4 lb)

Weight in water: 3.2 kg (7.0 lb)

Operating depth: 300 m (984 ft)

Medium Frequency (MF) Transducer—Directional

Transducer cable length: 25 m (82 ft) standard; 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), or 200 m (656 ft) optional

Frequency band: 16–21 kHz

Source level: 190 (± 6 dB) dB re 1 μ Pa @ 1m typical

Preamp gain: 30 dB

Radiation pattern: Toroidal $\pm 30^\circ$ @ 18 kHz typical

Housing construction: Delrin

Guard construction: 316 stainless steel

Dimensions: 14.0 cm (5.5 in.) max diameter by 30.9 cm (12.2 in.) long

Weight in air: 5.6 kg (12.3 lb)

Weight in water: 3.6 kg (7.9 lb)

Operating depth: 300 m (984 ft)

Band C Transducer

Transducer cable length: 25 m (82 ft) standard; 50 m (164 ft), 75 m (246 ft), 100 m (328 ft), or 200 m (656 ft) optional

Frequency band: 22–27 kHz

Source level: 183 (± 6 dB) dB re 1 μ Pa @ 1m typical

Preamp gain: 30 dB

Radiation pattern: Toroidal $\pm 40^\circ$ @ 25 kHz typical

Housing construction: Delrin

Guard construction: 316 stainless steel

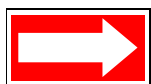
Dimensions:	14.0 cm (5.5 in.) max diameter by 25.9 cm (10.2 in.) long
Weight in air:	3.3 kg (7.3 lb)
Weight in water:	2.2 kg (4.9 lb)
Operating depth:	300 m (984 ft)

3 Installation and Setup

This section provides instructions on how to unpack and set up the UTS-9500 Universal Topside and make the power, the transducer and the optional external connections.

Unpacking and Inspection

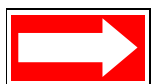
The topside is carefully packed in one or more sealed boxes, depending on the items ordered. Carefully inspect the boxes for any signs of external damage and immediately report any damage to Teledyne Benthos and to the freight carrier. After inspecting the boxes, locate and remove the packing list. While referring to the packing list, carefully remove the contents of the boxes, checking the items against the packing list to verify that all the items on the list are included. Inspect the items for any physical damage that might have occurred during shipment. Immediately report any damage to Teledyne Benthos and to the freight carrier.



NOTE Although the topside is ruggedly constructed of impact resistant material, it is not designed to be used as a shipping container. Be sure to pack the topside in a suitable container when shipping it.

Setting up the Topside

The topside is designed for deployment outdoors in open boats in a water spray environment and is therefore IP65 rated. However, when charging the battery, it must be indoors and near a 85–264 VAC, 47–63 Hz power source. For the outline dimensions of the topside, refer to Section 6, "Detailed Views."



NOTE The Li-Ion battery used in the topside has an initial capacity of 2.5 A·h. As the battery ages and is subjected to charge/discharge cycles, its capacity will reduce. However, the battery is specified to retain at least 2.5 A·h capacity after 300 charge/discharge cycles. Observing the temperature limits outlined in Section 2, "Specifications," will help ensure the specified capacity is maintained.

Deploying the Transducer

The supplied transducer is used as a dunking transducer. A directional transducer should be used if it is to be directly over the remote device; an omnidirectional transducer should be used if it is to be located at a large slant angle from the remote device. For the outline dimensions of the transducer, refer to Section 6, "Detailed Views." The transducer cable is used both to connect to the transducer and to lower it into the water. The weight of the transducer will assist in keeping it vertical when it is in the water. This cable must be strain relieved at the transducer end. Therefore, a Kellums grip is installed on the cable for this purpose. To strain relieve the cable, tie a nylon line or attach a shackle from the loop in the Kellums grip to one of the holes in the connector guard. When securing the line, ensure that there is sufficient slack in the section of cable between the Kellums grip and the transducer connection.

Connecting the Topside

The topside requires only a transducer connection. However, to charge the battery, the topside must be connected to power. Refer to "Battery Maintenance and Charging" on page 5-2 for some charging recommendations. In addition, a PC can be connected to send and receive acoustic commands, and a USB flash drive or the optional GNSS extender cable can be connected to either transfer log files or import GNSS data, respectively. A PC is not supplied. For the location and description of the connectors on the UTS-9500, refer to Figure 1-2 on page 1-5.



WARNING Only a properly rated, grounded AC outlet should be used along with the proper AC power cord when connecting the topside to AC power, as doing otherwise could result in an electrical shock.



WARNING Always connect the power cord to the topside *before* connecting it to the power source. Not connecting the power cord in this manner could result in electrical shock.

To connect the topside:

1. Remove the cover and connect the AC power cord to the PWR connector on the topside and then to the AC power source. Refer to Figure 3-1 for the connector pin orientation, and to Table 3-1 for the pinout information.



NOTE A user supplied cable may be substituted for the AC power cord if it meets the stated power requirements and includes an IEC-320-C13 connector.

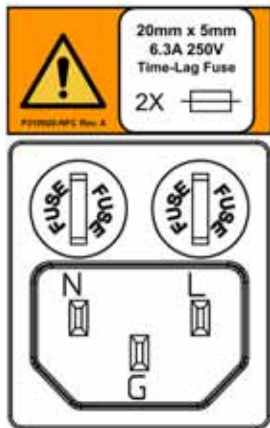


Figure 3-1 PWR Connector

Table 3-1 PWR Connector Pinouts

PIN	DESCRIPTION
N	AC Neutral
L	AC Line
G	AC Ground

2. If using the supplied transducer, connect the transducer cable to the transducer and to the XDCR connector on the topside. Refer to Figure 3-2 for the connector pin orientation, and to Table 3-2 for the pinout information.



Figure 3-2 XDCR Connector

Table 3-2 XDCR Connector Pinouts

PIN	DESCRIPTION
A	Receive Power
B	Transmit
C	Chassis Ground
D	Chassis Ground
E	Transmit Return

3. If sending and receiving acoustic telemetry modem commands and data, remove the cover and connect the serial port of a PC to the COM1 connector. Refer to Figure 3-3 for the connector pin orientation, and to Table 3-3 for the pinout information.



WARNING If when turning on the topside as described in "Activating the Touch Screen Display" on page 4-1, it does not operate as described in this manual, turn off the topside and then disconnect it from power.

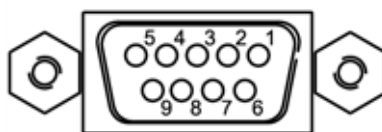


Figure 3-3 COM1 Connector

Table 3-3 COM1 Connector Pinouts

PIN	LABEL	DESCRIPTION	SIGNAL DIRECTION
2	TXD/RX(-)	RS-232 Transmit/RS-422 Receive(-)	Modem to Host/Host to Modem
3	RXD	RS-232 Receive	Host to Modem
4	TX(+)	RS-422 Transmit(+)	Modem to Host
5	GND	Common Ground	
6	TX(-)	RS-422 Transmit(-)	Modem to Host
7	CTS	Clear to Send	Host to Modem
8	RTS/RX(+)	Request to Send/RS-422 Receive(+)	Modem to Host/Host to Modem



CAUTION When the COM1 connection is configured as an RS-422 serial interface, the topside display features are disabled and cannot be used. The RS-422 serial interface is available on the COM1 connector only.



CAUTION When disconnecting the topside, do not pack any cables inside the topside case, as doing so may damage the touch screen display.

4. If transferring log files or importing GNSS data, remove the cover and connect a USB flash drive or the optional GNSS receiver module, respectively, to the USB connector. When connecting the GNSS receiver module, the use of the extender cable is recommended for an IP65 rated connection at the USB connector.



CAUTION The connection at the USB connector on the front panel is only IP65 rated when the optional GNSS extender cable is used.

4 Using the Touch Screen Display

This section provides instructions on how to use the touch screen display of the UTS-9500 Universal Topside to operate Teledyne Benthos acoustic transponders, releases and acoustic telemetry modems and EdgeTech, URI and GeoPro releases. Operations include sending data to and receiving data from remote devices, acquiring ranges from remote devices and transponders, and sending commands, including release commands to remote devices. To perform these operations, the topside must be set up and installed as described in Section 3, "Installation and Setup."

Activating the Touch Screen Display

The touch screen display is activated when the topside is turned on. To turn on the UTS-9500, switch the ON/OFF switch to ON. The screen will flash blue to indicate that power has been applied. Shortly thereafter the Splash screen will open as shown in Figure 4-1, followed about 20 seconds later by the Initialization screen as shown in Figure 4-2, which is for a 7–16 kHz UTS-9500M. The Initialization screen, which includes a progress indicator, will remain open for about 20 seconds as the topside is initialized. If no startup configuration was previously saved, the default Home Port screen will open next as shown in Figure 4-3. If a startup configuration was saved, it will



Figure 4-1 *Splash Screen for a UTS-9500M Universal Topside*



Figure 4-2 *Initialization Screen for a UTS-9500M Universal Topside*

open in accordance with the saved startup configuration as described in "Saving a Default Startup Configuration" on page 4-23. In addition, the first time the UTS-9500 is turned on the speaker will be unmuted and the volume will be set to maximum. For instructions on how to adjust the volume, refer to "Adjusting the Speaker and System Sounds Volumes" on page 4-15.

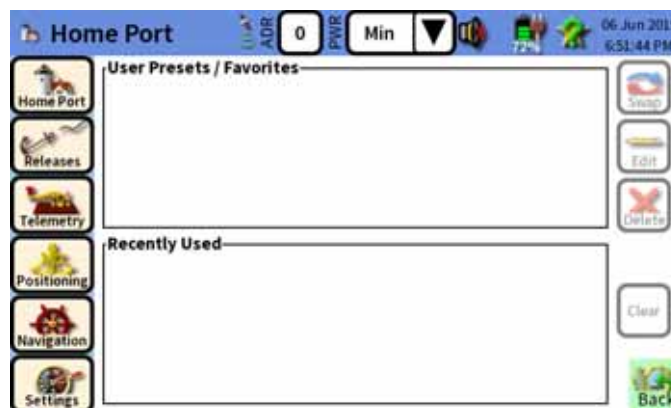


Figure 4-3 Home Port Screen

Touch Screen Display Overview

The touch screen display comprises a Menu bar on the left, a Status and Control bar on the top, and an operations area which makes up the rest of the display. In addition, a Back button is provided in the lower right corner of the display for navigating to previous screens. The Menu, the Status and Control bar and the Back button are always visible, but depending on the operating state of the UTS-9500, they are at times disabled. A Menu bar item is chosen or a button is operated by simply touching it. A cursor briefly appears at the point of contact.

Menu Bar

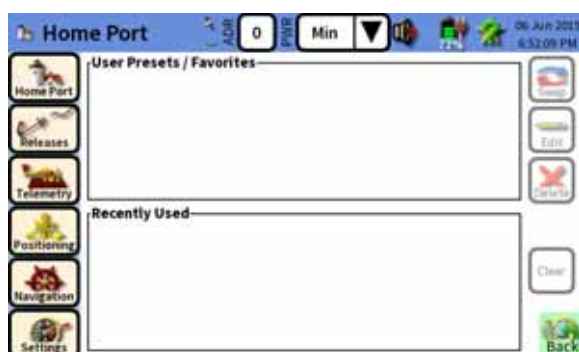
The Menu bar provides direct access to the Home Port screen and to five different activity categories. Selecting any one of these items either opens a remote device menu which provides the available list of remote devices that can be chosen to perform the activity, or an activity menu which enables the performance of an activity directly, such as topside settings and firmware updates. For a complete list of remote device types versus available activities, refer to Table 4-1 on page 4-4. The Menu bar and remote device/activity menus, which are shown in Figure 4-4, are the following:



Home Port. Opens the Home Port screen where preset and recently used screens can be directly accessed.



Releases. Opens the Releases menu where an acoustic release device can be selected and operated. The release devices include Teledyne Benthos releases as well as those from EdgeTech, URI and GeoPro. The Teledyne Benthos releases include the R Series Releases, the SM-97X SMART Modem, the SR-9100 SMART Release, the 8XX FSK Acoustic Release, and the 875-T Series Releases.



MENU BAR



RELEASES MENU



TELEMETRY MENU



POSITIONING MENU



NAVIGATION MENU



SETTINGS MENU

Figure 4-4 Topside Menu Bar and Remote Device/Activity Menus

Table 4-1 Remote Device Types Versus Available Activities

Activity	Release	Comms	Range	Xpnd	Location	Config	Diag
Remote Device							
R Series Release	•		•	•	•	•	•
SM-97X SMART Modem	•	•	•		•	•	•
SR-9100 Acoustic Release	•	•	•		•	•	•
8XX FSK Acoustic Release	•			•	•		
875-T Series Releases	•		•		•	•	•
ATM-9XX Series Acoustic Telemetry Modems		•	•		•	•	•
Compact Modem		•	•		•	•	•
EdgeTech	•			•	•		
URI	•			•	•		
GeoPro	•			•	•		
Universal		•	•	•	•		



Telemetry. Opens the Telemetry menu where an acoustic modem device can be selected and operated. The modem devices include the ATM-9XX Series Acoustic Telemetry Modems, the SM-97X SMART Modem, the SR-9100 SMART Release, and the Compact Modem. In addition, the Telemetry menu provides a universal selection which enables basic operation of any acoustic telemetry modem. For a UTS-9500A Universal Topside, this item is not available.



Positioning. Opens the Positioning menu which offers several position related functions. Either one of two currently available acoustic positioning schemes, tonal transpond ranging or broadband ranging, can be selected along with an associated remote device. The Location tab for a remote device, which contains position information for that device, may also be accessed through this menu where an acoustic survey of that device may be launched. Or an acoustic survey of an already selected device type can be launched directly from the Positioning menu. The remote devices that can be selected for tonal transpond include the R Series Releases; the 8XX FSK Acoustic Releases; the EdgeTech, URI and GeoPro Ocean Bottom Seismometer (OBS) releases; and a universal selection which enables the use of the tonal transpond scheme for any acoustic release or telemetry modem. The remote devices that can be selected for broadband ranging include the ATM-9XX Series Acoustic Telemetry Modems, the R Series Acoustic Telemetry Modems, the SM-97X SMART Modem, the SR-9100 Acoustic Release, the 875-T Series Release, and a universal selection which enables the use of the broadband ranging scheme for any Teledyne Benthos acoustic release or telemetry modem. Any available remote device type may be selected for the location function.



Navigation. Opens the Navigation menu which offers several navigation related functions. GNSS will bring up the screen through which all global navigation satellite system (GNSS) functions can be accessed, including the US-administered GPS, the Russian GLONASS, the European Union Galileo, and the Chinese BeiDou systems. A graphical plot is also accessible which depicts the current position of the topside along with nearby waypoints stored in its waypoint database. Other functions on the Navigation menu allow for the setting or clearing of a destination waypoint and the instant creation of a waypoint marking the current position of the topside.



Settings. Opens the Settings menu which provides access to Help and enables the adding of presets, the configuration of the topside parameters, the setting of user preferences, the editing of system parameters, and the saving of a default startup configuration. Help provides content sensitive or general help for many of the operator functions of the topside and includes system information, license and more. Presets that are a snapshot of the current screen with its settings can be saved and named along with an associated preset button added to the User Presets/Favorites area of Home Port screen. Touching a preset button opens the associated screen directly along with the device settings. Topside parameters enable the configuration of its modem address and transmit power, which is also configurable through the Status and Control bar at the top of the touch screen display, and other settings, such as the speed of sound in water. A number of acoustic, battery, and miscellaneous diagnostics that pertain only to the topside are available here also. User preferences include volume and backlight settings, graphical theme, units, screen saver timeout, and more. The system parameters include topside time and date settings, event logging settings and functions, serial data port settings, and firmware update controls. Saving of a startup configuration saves the currently open screen along with all the remote device and UTS-9500 settings and configures the topside to open to that screen on every power up.

Status and Control Bar

The Status and Control bar is shown in Figure 4-5. The Status and Control bar includes controls which are used to set the address of the UTS-9500, select the transmit power level, set the time and date, and adjust the speaker volume. The Status and Control bar also includes a display of the currently open screen name, a GNSS status indicator, a time and date display and access to the time and date settings, access to help, and an indicator that indicates the battery charge level and whether the topside is being powered by the internal battery or by external AC power.

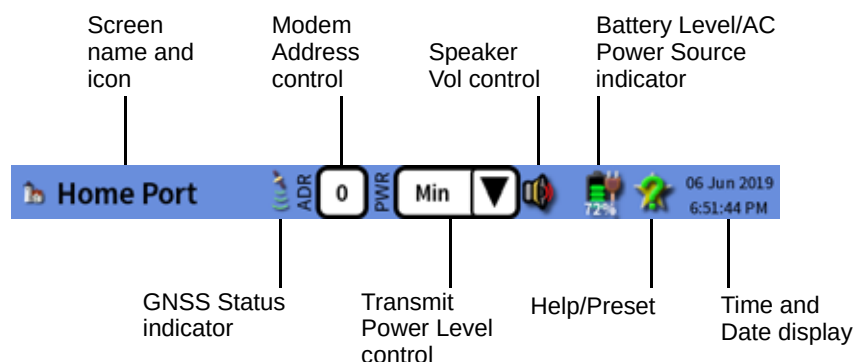


Figure 4-5 Status and Control Bar

The Status and Control bar controls and displays are the following:

Screen name and icon. The name and associated icon of the currently opened screen. The icon defaults to a Teledyne logo if the current screen does not have a dedicated icon.

Modem Address control. Sets the address of the UTS-9500.

GNSS Status Indicator. Present only if the GNSS option is installed. The indicator is grey with no radio waves when the GNSS option is installed but there is no GNSS connected, colored with animated radio waves displayed when the GNSS receiver module is connected and data are being received, and gray with stationary radio waves and a flashing exclamation point when the GNSS receiver module is connected but data are not being received.

Transmit Power Level control. Selects the transmit power level of the UTS-9500.

Speaker Vol control. Adjusts the volume of or mutes the speaker.

Battery Level/AC Power Source indicator. Indicates the charge level of the UTS-9500 battery and whether the topside is being powered by the battery or by external AC power.

Help/Presets. Opens the help screen which provides content sensitive help. Touching and holding the Help/Presets control enables adding the current screen and the selected device type and topside settings as a user preset.

Time and Date display. Displays the current time and date and opens the Time/Date screen.

Operations Area

The operations area of the touch screen display is used for displays, indicators and controls applicable to the selected activity to be performed. When an activity is selected from the Menu bar that requires additionally choosing a remote device to perform the activity, a screen opens to a tab that supports the selected activity for the device. For example, selecting Telemetry, and then choosing SM-97X opens the SM-97X screen to the Comms tab; selecting Releases, and then choosing SM-97X opens the SM-97X screen to the Release tab. Additional tabs are provided that run horizontally across the top of the screen, where each tab enables control of an activity supported by the device. For remote devices that can perform more complex activities, some tabs include additional tabs that support these functions. These additional tabs run vertically on the right side of the open tab.

Back Button

The back button is located in the lower right corner of the touch screen display. This button is used to return to the previous screen from that which is currently open.

General Setup

The general setup of the topside involves checking the battery level and AC power source, checking the time and date, setting the time and date and time zone if required, checking the clock battery voltage, selecting the modem address and transmit power level, adjusting the speaker and system sounds volumes, adjusting the touch screen display backlight, configuring the screen saver and the serial port, enabling or disabling the touch beeps, selecting the displayed range units, changing the graphical theme if desired, and calibrating the touch screen display if required.

Working with Information Windows

When operating the topside, information windows will occasionally open over the currently open screen in the touch screen display. These windows provide status information on the operation currently being performed, such as ranging to a remote device, waking up a Compact Modem, testing the acoustic link, and other operations. Information windows also display data, such as range, received data statistics and other information. There are two types of information windows, locked and unlocked.

Locked information window. A locked information window is an information window that opens when the topside is waiting for a response from a remote device. It cannot be manually closed. A locked information window can be easily identified, as the screen that it overlays is dimmed as shown in Figure 4-6. A locked information window will automatically close when the operation being performed is complete.

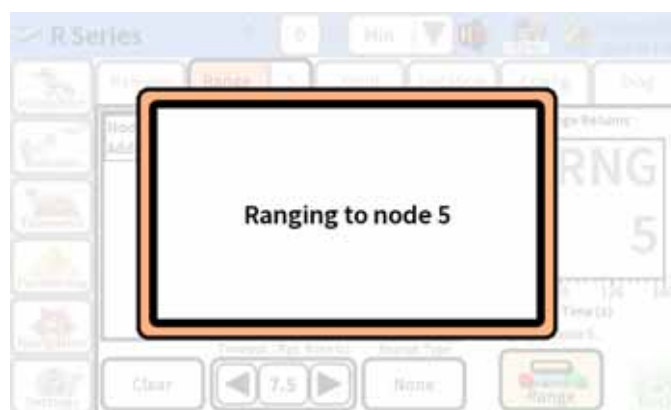


Figure 4-6 Example of a Locked Information Window

Unlocked information window. An unlocked information window is an information window that displays data. It can be manually closed at any time by touching anywhere inside the window. Unlike a locked information window, the screen that an unlocked information window overlays is not dimmed as shown in Figure 4-7. Most unlocked information windows will automatically close after several seconds if not manually closed first.

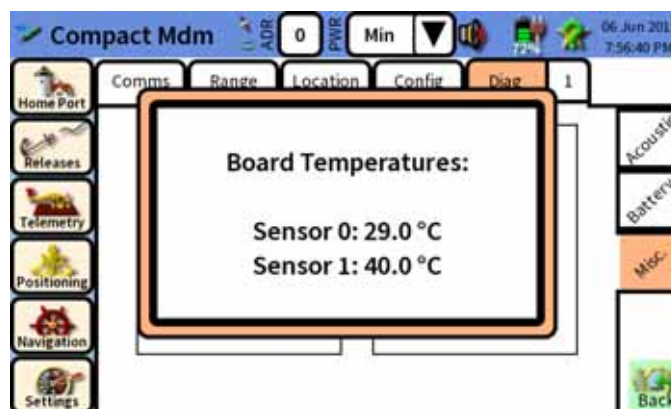


Figure 4-7 Example of an Unlocked Information Window

Viewing the Battery Level/AC Power Source Indicator

The Battery Level/AC Power Source indicator includes an icon that indicates the approximate charge remaining in the internal battery along with a digital display of the percent capacity remaining to an accuracy of 1%. The display is directly below the icon. The icon also indicates whether external AC power is powering topside and charging the battery. The Battery Level/AC Power Source indicator provides the following indications:



Indicates that the battery is fully charged.



Indicates that the battery is at 20–40% capacity remaining.



Indicates that the battery is at less than 20% capacity remaining.



Indicates that the topside is being powered by external AC power and the battery is being charged. The yellow lightning bolt flashes on and off at a slow rate while charging. It is off when it is fully charged. Also indicates the charge level in percent.



Indicates that the topside is being powered by external AC power as well as indicates the charge level in percent.

Viewing the Time and Date Display

The Time and Date display is located in the upper right corner of the touch screen display. The display is composed of the time in hours, minutes and seconds in either 12-hour or 24-hour format with an AM or PM indication for 12-hour format, and the day, month and year.

Setting the Time Zone

To set the time zone:

1. Touch the Time and Date display, or select Settings from the Menu bar, select System, and then choose Time/Date.

The Time/Date screen opens as shown in Figure 4-9 on page 4-11.

2. Touch the Time Zone button.

The Modify Time Zone screen opens as shown in Figure 4-8.

3. Select the region and the time zone from the drop-down list, and then touch OK. If the selection is hidden, tap the up or down arrow or drag the slider up or down to show it.

The Time Zone button indicates the selected country and time zone.



Figure 4-8 Modify Time Zone Screen

Manually Setting the Time and Date and Viewing the Clock Battery Voltage

The time and the date can be manually set, and the time can be displayed in 12-hour or 24-hour time. In addition, the clock battery voltage can be viewed.

To manually set the time and date and view the clock battery voltage:

1. Touch the Time and Date display, or select Settings from the Menu bar, select System, and then choose Time/Date.

The Time/Date screen opens as shown in Figure 4-9. The clock battery voltage can be viewed in the lower left corner of the screen.

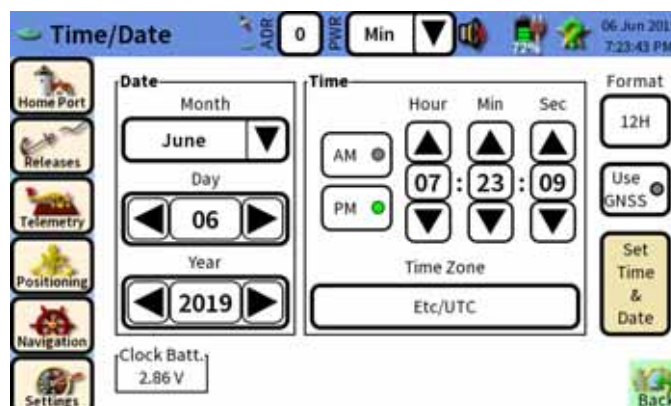


Figure 4-9 Time/Date Screen

2. Select either 12-hour or 24-hour time by touching the Format button. The button indicates the current time format.
3. If the indicator on the Use GNSS button is lit, touch the button to turn it off.
4. If 12-hour format is selected, touch the AM or PM button to select AM or PM. The indicator on the button is lit when selected.
5. Tap or touch and hold the up or down arrow of the Hour setting to set the hour. Repeat for the Min and Sec settings.
6. Touch the Month selection.

A drop-down list opens as shown in Figure 4-10.

7. Select the month from the drop-down list.
8. Tap or touch and hold the left or right arrow of the Day setting to set the day.
9. Tap or touch and hold the left or right arrow of the Year setting to set the year.

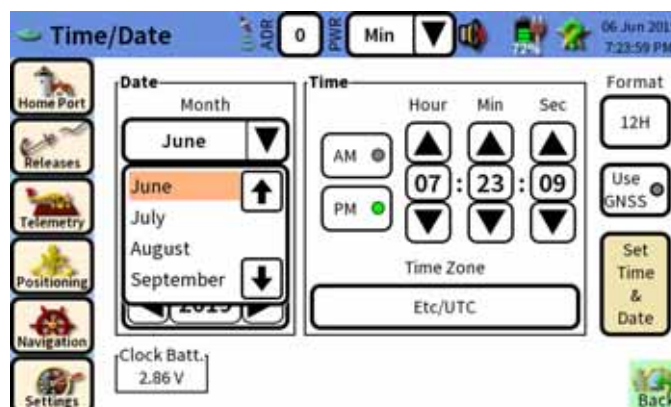


Figure 4-10 Month Drop-Down List

10. Touch the Set Time & Date button to set the time and date.

An information window temporarily opens indicating that the system time is being updated followed by another information window indicating that the time has been updated.

Automatically Setting the Time and Date from the GNSS

If an external GNSS receiver is connected to the USB connector, it can be used to automatically set the time and date. For this function to work, the GNSS receiver must provide "ZDA" type time/date messages obtained from the satellite system to the topside.

To automatically set the time and date from the GNSS:

1. Touch the Time and Date display, or select Settings from the Menu bar, select System, and then choose Time/Date.

The Time/Date screen opens as shown in Figure 4-9 on page 4-11.

2. Select either 12-hour or 24-hour time by touching the Format button. The button indicates the current time format.
3. Touch the GNSS button such that the indicator on the button is lit.
4. If 12-hour format is selected, touch the AM or PM button to select AM or PM. The indicator on the button is lit when selected.

Setting the Topside Address

The topside has an address for use in broadband communications with other remote devices. This address can be any valid acoustic telemetry modem or release address but should be different than that of any remote device if there are two or more of them for which two way acoustic communications is to be performed. When releasing a single remote device, the topside address is irrelevant. The default address is zero. The topside address can be set using the Modem Address control on the Status and Control bar or from the Config tab of the Topside screen of the Settings menu.

To set the topside address using the Modem Address control on the Status and Control bar:

1. Touch the Modem Address control on the Status and Control bar.

The topside address keypad opens as shown in Figure 4-11.

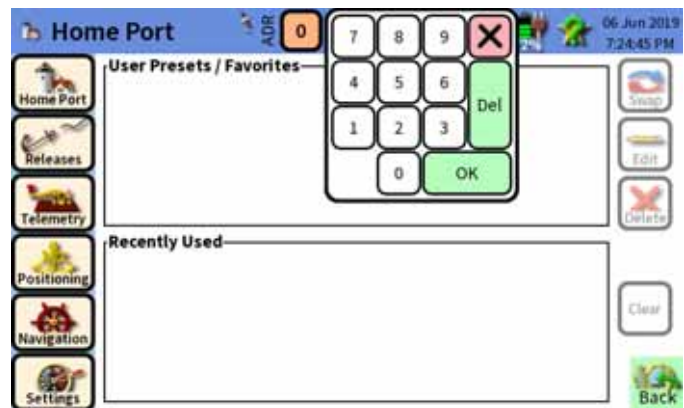


Figure 4-11 Topside Address Keypad

2. Enter the topside address, three characters maximum, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the topside address setting is displayed.

To set the topside address from the Config tab of the Topside screen of the Settings menu:

1. Select Settings from the Menu bar, and then choose Topside.

The Topside screen opens to the Config tab as shown in Figure 4-12.

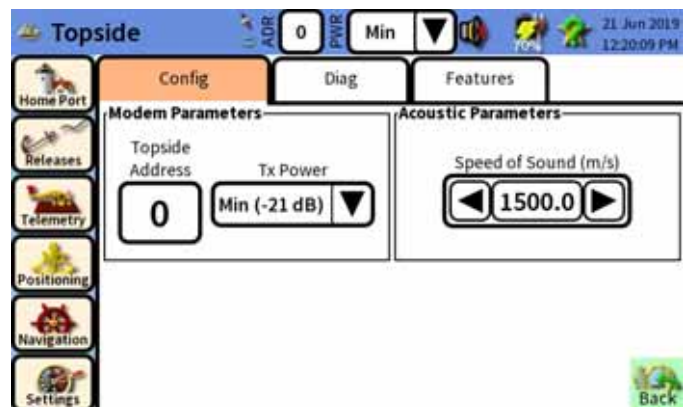


Figure 4-12 Topside Screen—Config Tab

2. Touch the Topside Address setting in the Modem Parameters area.

The topside address keypad opens.

3. Enter the topside address, three characters maximum, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the topside address setting is displayed

Selecting the Topside Transmit Power Level

The transmit power level of the topside can be selected by selecting an attenuation in decibels, or by selecting minimum for the lowest power (maximum attenuation) or maximum for the highest power (no attenuation). The transmit power level can be set using the Transmit Power Level control on the Status and Control bar or from the Config tab of the Topside screen of the Settings menu.

To select the topside transmit power level using the Transmit Power Level control on the Status and Control bar:

1. Touch the Transmit Power Level control on the Status and Control bar.

A drop-down list opens as shown in Figure 4-13.

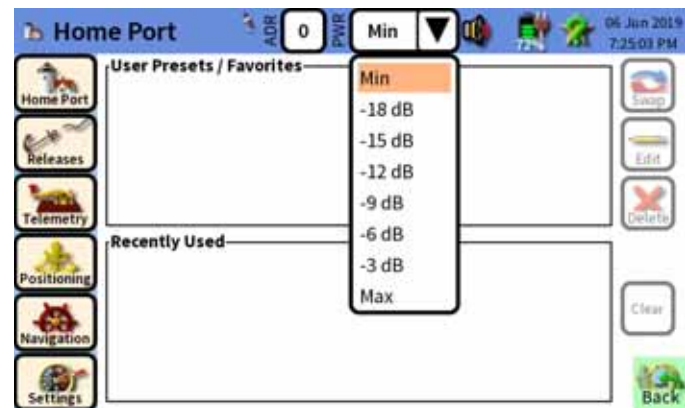


Figure 4-13 Transmit Power Level Control Drop-Down List

2. Select the attenuation level from the drop-down list.

The drop-down list closes and the transmit power level selection is displayed.

To set the topside transmit power level from the Config tab of the Topside screen of the Settings menu:

1. Select Settings from the Menu bar, and then choose Topside.

The Topside screen opens to the Config tab as shown in Figure 4-12 on page 4-13.

Select the attenuation level from the Tx Power drop-down list in the Acoustic Parameters area.

Setting the Speed of Sound in Water

The speed of sound in water that the topside uses in calculating distances can be set.



NOTE The units used for the speed of sound in water are selected as described in "Selecting the Sound Speed Units" on page 4-20

To set the speed of sound in water:

1. Select Settings from the Menu bar, and then choose Topside.

The Topside screen opens to the Config tab as shown in Figure 4-12 on page 4-13.

2. In the Acoustic Parameters area, set the speed of sound using the Speed of Sound spinner control.



NOTE The speed of sound in water can also be set from the Survey/Settings tab of the GNSS screen as described "Creating and Saving a Surveyed Waypoint" on page 4-109.

Adjusting the Speaker and System Sounds Volumes

The speaker is located on the front panel of the topside. It outputs audible signals of the transmitted and received data, pings and replies. It also outputs system sounds, such as a beep when a touch screen display control is touched or an error occurs, as well as other audio indications. The speaker volume can be adjusted or muted using the Speaker Vol Control on the Status and Control bar or the Master Volume control on the UI Preferences screen. The system sounds volume can be separately adjusted or muted using the Sys. Sound Volume control on the UI Preferences screen.



NOTE The Speaker Vol Control or the Master Volume control adjusts the volume of *all* the topside sounds, including those controlled by the Sys. Sound Volume control.

To adjust the speaker volume using the Speaker Vol control on the Status and Control bar:

1. Touch and hold the Speaker Vol control on the Status and Control bar.

The Vol. window opens as shown in Figure 4-14.

2. Touch and drag the slider up or down to adjust the volume, or touch anywhere in the slide to move the slider to that location.

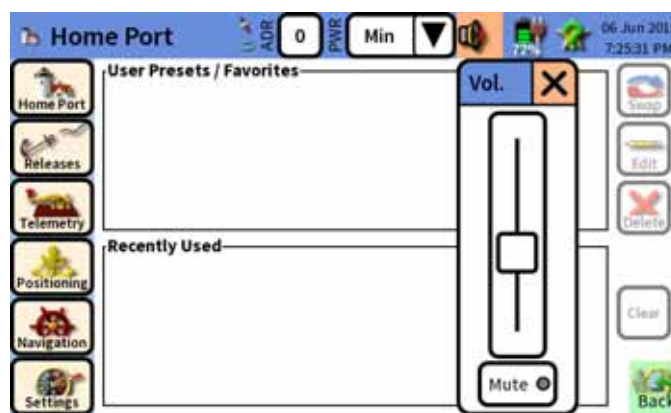


Figure 4-14 Vol. Window

The speaker can be muted and unmuted by touching the Mute button in the Vol. window or by touching—but not holding—the Speaker Vol control on the Status and Control bar. When muted, the indicator on the button is lit. Also when muted, the Speaker Vol control is shown overlayed with a red circle with a line through it. To turn the speaker back on, touch either button again.

3. Touch the X mark to close the Vol. window.

To adjust the speaker volume using the Master Volume control on the UI Preferences screen:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15.

2. Touch and drag the Master Volume slider up or down to adjust the volume, or touch anywhere in the slide to move the slider to that location.

The speaker can be muted by touching the Mute button. When muted, the indicator on the button is lit. To turn the speaker back on, touch the Mute button again.

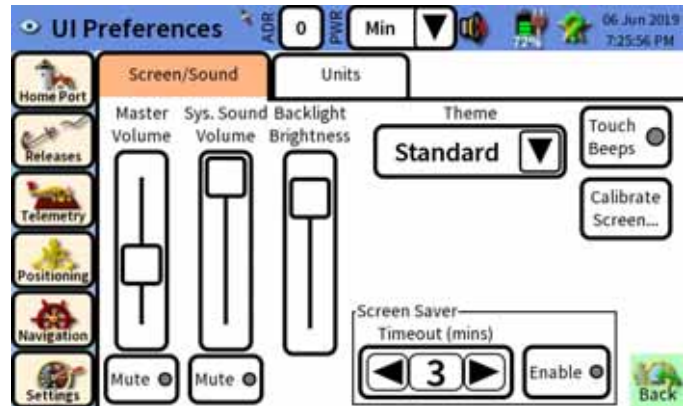


Figure 4-15 UI Preferences Screen—Screen/Sound Tab

To adjust the system sounds volume:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15.

2. Touch and drag the Sys. Sound Volume slider up or down to adjust the volume, or touch anywhere in the slide to move the slider to that location.

The system sounds can be muted by touching the Mute button. When muted, the indicator on the button is lit. To turn the systems sounds back on, touch the Mute button again.

Adjusting the Touch Screen Display Backlight

The touch screen display backlight can be adjusted to account for room lighting. Should the brightness be adjusted too high, a WARNING window will open with a choice to keep the setting or choose a safe one for the operating temperature. An unsafe zone indication is also provided on the Backlight Brightness slider.

To adjust the touch screen display backlight:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens as shown in Figure 4-15.

2. Touch and drag the Backlight Brightness slider up to increase the backlight intensity or down to decrease the intensity. Or touch anywhere in the slide to move the slide to that location.

Configuring the Screen Saver

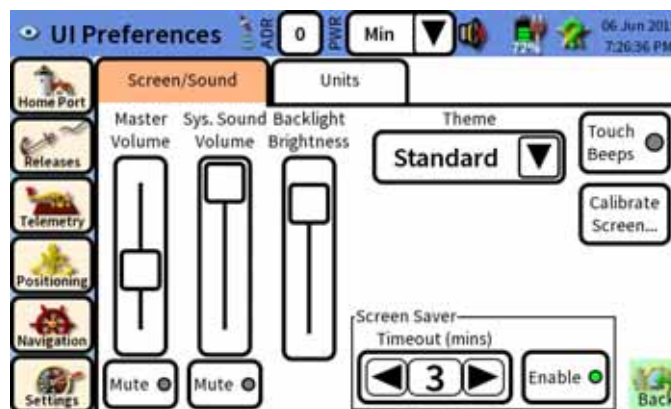
The topside includes a screen saver which turns off the backlight after a predetermined time if the touch screen display is not touched. However, the backlight will come on briefly about every ten seconds to indicate that the topside is on, and the Teledyne Benthos logo will be visible on the screen, moving to a different location each time. Normal continuous backlight operation will return when the screen is touched. The period over which the screen saver will activate can be adjusted, or the screen saver can be disabled entirely.

To configure the screen saver:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens as shown in Figure 4-15 on page 4-16.

2. When the screen saver is enabled, the indicator on the Enable button on the Screen Saver area of the UI Preferences screen is lit as shown in Figure 4-16. Touch the button such as to enable the screen saver. The indicator should be lit. To turn off the screen saver, touch the Enable button again.
3. Tap or touch and hold the left or right arrow of the Timeout setting to set the time in minutes after which to turn the display off if the touch screen display is not touched.



**Figure 4-16 UI Preferences
Screen—Screen Saver Enabled**

Enabling or Disabling the Touch Beeps

The topside provides an audible beep when touching a control. The touch beeps can be enabled or disabled.

To enable or disable the touch beeps:

1. Select Settings from the Menu bar, and then choose UI Prefs.
2. The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.
3. When touch beeps is enabled, the indicator on the Touch Beeps button is lit as shown in Figure 4-17. Touch the button such as to enable or disable touch beeps.

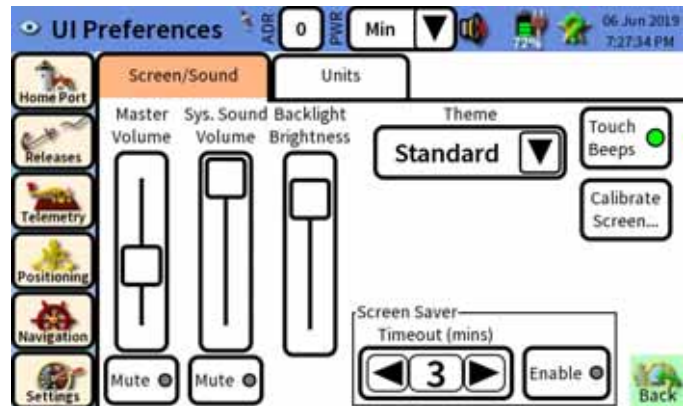


Figure 4-17 UI Preferences Screen—Touch Beeps Enabled

Changing the Graphical Theme

Three graphical themes are available: Standard, High Visibility and Night. The Standard theme is a bright, colorful theme that is suitable in most operating conditions. The High Visibility theme presents a high contrast with minimal color and is best used in a bright environment. The Night theme presents muted colors for comfortable viewing in low light.

To change the graphical theme:

1. Select Settings from the Menu bar, and then choose UI Prefs.
The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.
2. Touch the Theme selection.
A drop-down list opens as shown in Figure 4-18.

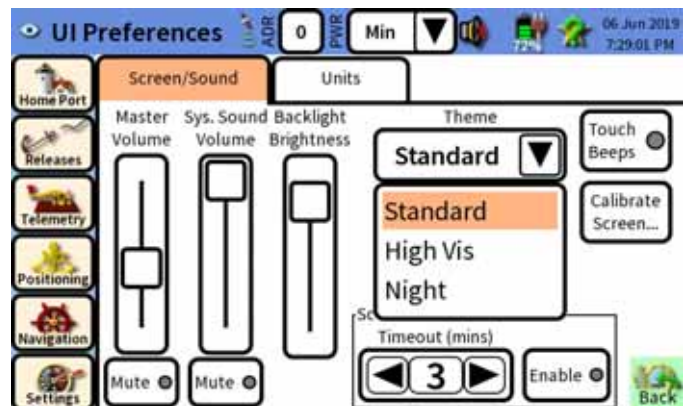


Figure 4-18 UI Preferences Screen—Theme Drop-Down List

3. Select the desired theme from the drop-down list.

A message is briefly displayed indicating that the theme is being switched, the drop-down list closes, and the selected graphical theme takes effect.

Selecting the Distance Units

Metric or Imperial units can be selected for the displayed distance units.

To select the distance units:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.

2. Touch the Units tab.

The Units tab opens as shown in Figure 4-19.

3. Touch the Distance Units selection.

A drop-down list opens as shown in Figure 4-20.

4. Select the units from the drop-down list.

The drop-down list closes and the units selection is displayed.

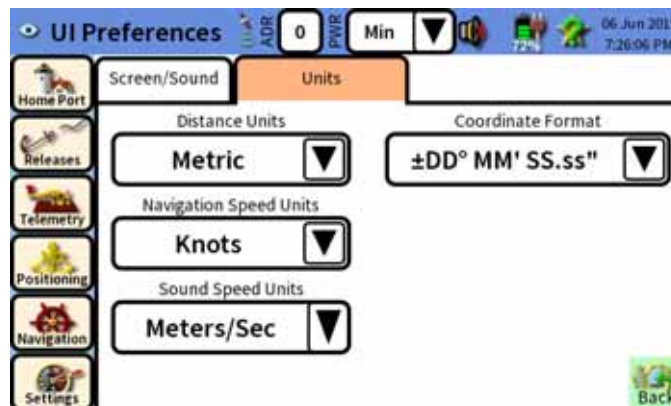


Figure 4-19 UI Preferences Screen—Units Tab

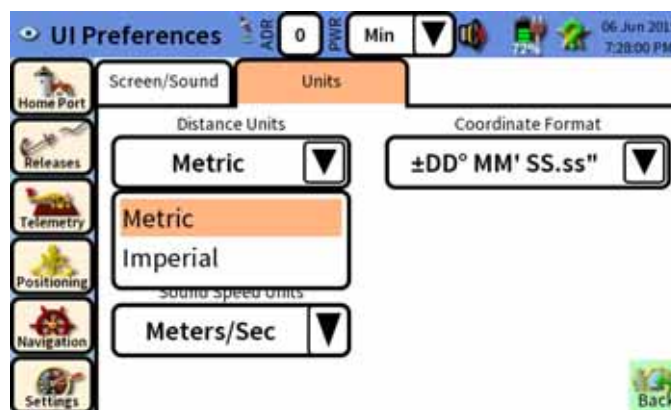


Figure 4-20 Units Tab—Distance Units Drop-Down List

Selecting the Navigation Speed Units

The navigation speed units can be selected for when calculating speed while performing navigation functions.

To select the navigation speed units:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.

2. Touch the Units tab.

The Units tab opens as shown in Figure 4-19 on page 4-19.

3. Touch the Navigation Speed Units selection.

A drop-down list opens as shown in Figure 4-21.

4. Select the units from the drop-down list.

The drop-down list closes and the units selection is displayed.

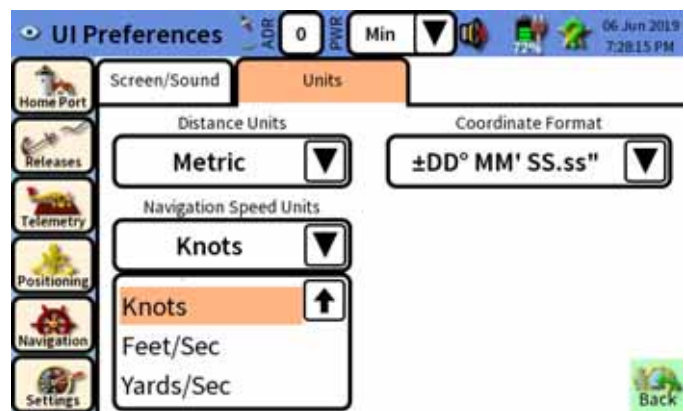


Figure 4-21 Units Tab—Navigation Speed Units Drop-Down List

Selecting the Sound Speed Units

The sound speed units that are used for the speed of sound in water setting in the Acoustic Parameters box on the Config tab of the Topside screen can be selected. Refer to "Setting the Speed of Sound in Water" on page 4-14 for instructions on how to make this setting.

To select the sound speed units:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.

2. Touch the Units tab.

The Units tab opens as shown in Figure 4-19 on page 4-19.

3. Touch the Sound Speed Units selection.

A drop-down list opens as shown in Figure 4-22.

4. Select the units from the drop-down list.

The drop-down list closes and the units selection is displayed.

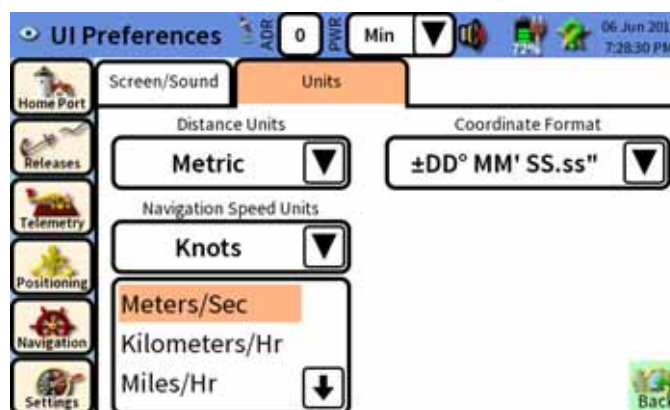


Figure 4-22 Units Tab—Sound Speed Units Drop-Down List

Selecting the Coordinate Format

The format of latitude and longitude coordinate displays can be selected. The selected format also applies to coordinate entries.

To select the coordinate format:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens to the Screen/Sound tab as shown in Figure 4-15 on page 4-16.

2. Touch the Units tab.

The Units tab opens as shown in Figure 4-19 on page 4-19.

3. Touch the Coordinate Format selection.

A drop-down list opens as shown in Figure 4-23.

4. Select the coordinate format from the drop-down list.

The drop-down list closes and the coordinate format selection is displayed.

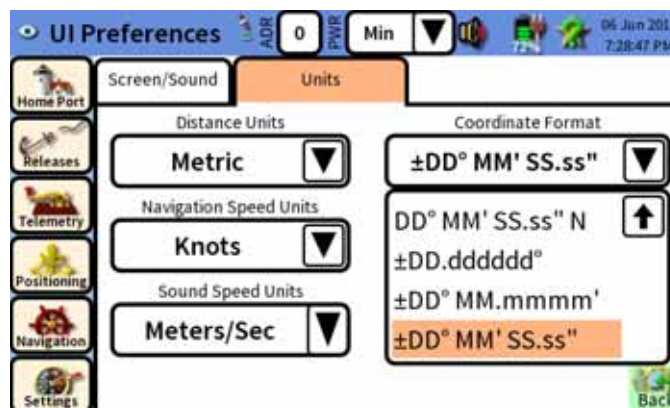


Figure 4-23 Units Tab—Coordinate Format Drop-Down List

Configuring the Serial Port

There is one serial port, COM1, which can be configured for RS-232, RS-422 or RS-485 operation. It can be connected to a PC and used for external control of the acoustic telemetry modem function of the UTS-9500 using Teledyne Benthos CLAM shell commands. The serial port is also used to send and receive data.

To configure the serial port:

1. Select Settings from the Menu bar, select System, and then choose Serial.

The Serial Port Cfg screen opens as shown in Figure 4-24.

2. Touch the Baud Rate setting and select the baud rate from the drop-down list.
3. Touch the Duplex setting and select Half or Full.

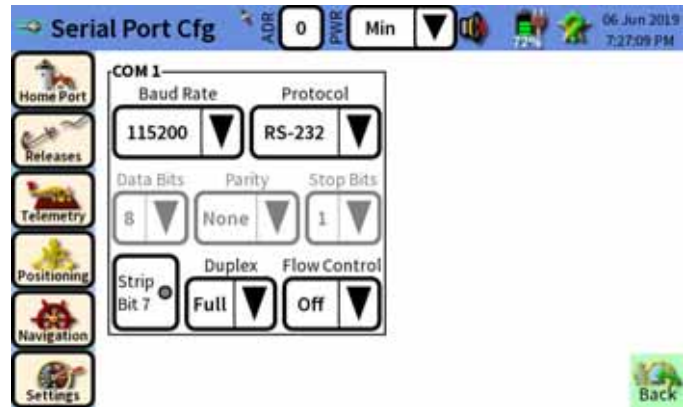


Figure 4-24 Serial Port Cfg Screen

Selecting Half will prevent the topside from echoing back characters entered on the serial port. Selecting Full will cause the topside to echo back all entered characters.



NOTE The Data Bits, Parity and Stop Bits settings are shown for informational purposes only. They cannot be changed.

4. Touch the Flow Control setting and select SW, HW or Off.

Selecting SW will cause the topside to issue XON/XOFF characters over the serial port to manage the flow of characters. Selecting HW will cause the topside to use RTS/CTS control lines to manage the character flow. Selecting Off will prevent the topside from using flow control.

5. To enable Strip Bit 7, touch the Strip Bit 7 button. When enabled, the indicator on the button is lit. To disable Strip Bit 7, touch the Strip Bit 7 button again.

Enabling Strip Bit 7 allows only ASCII characters of character codes 127 or less to be sent to the topside.



CAUTION Changing the serial protocol will render the touch screen display of the topside inoperable. Should this situation occur, turn the topside off and then on again to return the display to normal operation.

6. Touch the Protocol setting and select RS-232, RS-422 or RS-485 for the serial interface.

Touch Screen Calibration

If when touching a control, it does not respond or the screen cursor is not aligned with the screen presses, the touch screen display may require calibration. For instructions on how to calibrate the touch screen display, refer to "Calibrating the Touch Screen Display" on page 5-3.

Saving a Default Startup Configuration

The currently open screen, along with *all* the device and UTS-9500 settings and opening tabs in screens can be saved as the default startup configuration. To save a default startup configuration, make all of the settings for the device, select the screen and tab to open at startup, select Settings from the Main menu, and then choose Save. An information window temporarily opens indicating the configuration is being saved followed by another information window indicating that the configuration has been saved. When the topside is turned on, the display will open to the device screen and tab saved as the startup configuration with all the settings present.

Viewing, Adding and Removing an Optional Feature Key

Optional feature keys enable factory installed features. These keys can be viewed, added and deleted from the Features tab of the Topside screen. An optional feature key can be added by entering the key identification number using the feature key keyboard or by reading it from a USB flash drive.

To view the installed optional feature keys:

1. Select Settings from the Menu bar, choose Topside, and then touch the Features tab.

The Features tab opens as shown in Figure 4-25.

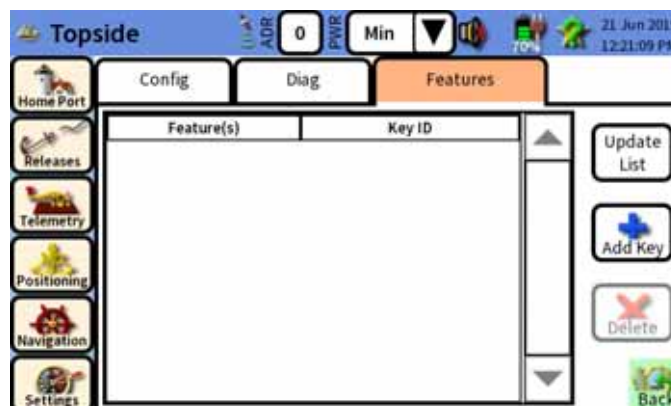


Figure 4-25 Topside Screen—Features Tab

2. Touch the Update List button.

An information window temporarily opens indicating that the feature keys are obtained, and then the installed optional feature keys are displayed as shown in Figure 4-26. The feature key name and the corresponding key identification number are shown for each.

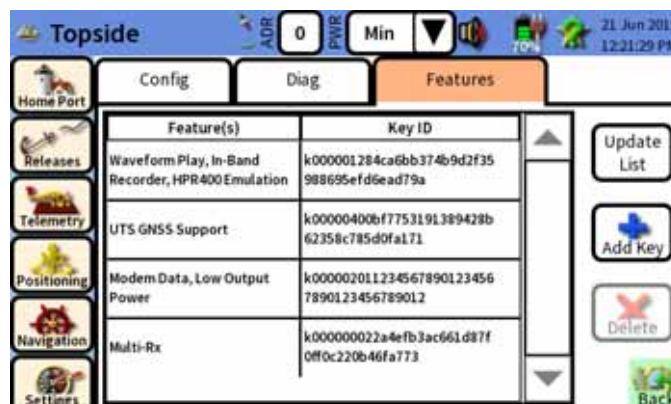


Figure 4-26 Features Tab—Optional Feature Keys Installed

To add an optional feature key using a keyboard:

1. Select Settings from the Menu bar, choose Topside, and then touch the Features tab.

The Features tab opens as shown in Figure 4-25.

2. Touch the Add Key button.

The Add Feature Key window opens as shown in Figure 4-27.

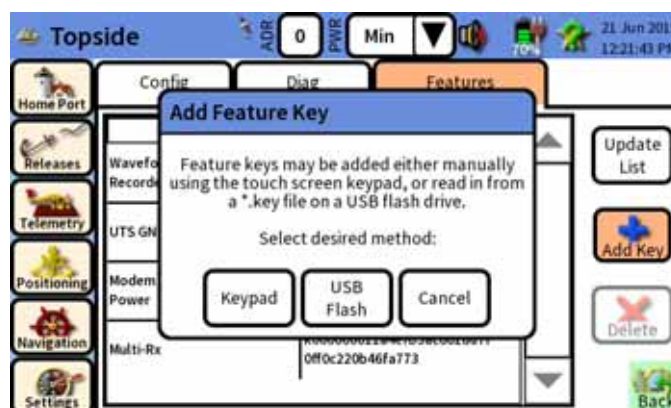


Figure 4-27 Features Tab—Add Feature Key Window

3. Touch Keypad.

The feature key keyboard opens as shown in Figure 4-28.

4. Enter the key identification number. The first character is entered automatically, and no more than a total of 41 characters can be entered.

5. Touch OK.

An information window temporarily opens indicating that the feature key has been added and that rebooting is required.

6. Turn the topside off and then on again.

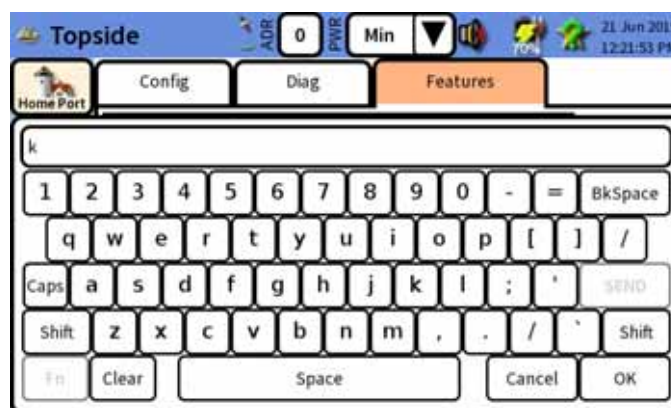


Figure 4-28 Features Tab—Feature Key Keyboard

To add an optional feature key by reading it from a USB flash drive:

1. Select Settings from the Menu bar, choose Topside, and then touch the Features tab.

The Features tab opens as shown in Figure 4-25 on page 4-24.

2. Touch the Add Key button.

The Add Feature Key window opens as shown in Figure 4-27 on page 4-24.

3. Touch USB Flash.

The Insert USB Drive window opens as shown in Figure 4-29. The drive must have KEY files to be read. A KEY file is a text file with a .key extension containing a single line with the 41-character feature key.

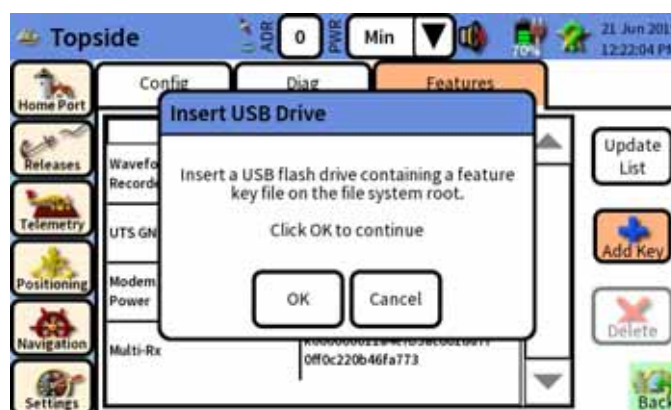


Figure 4-29 Features Tab—Insert USB Drive Window

4. Insert the USB flash drive into the USB connector.

5. Touch OK.

The Select File window opens as shown in Figure 4-30.

6. Touch the Select File selection, select the option to be added from the drop-down list, and then touch OK. All KEY files will be listed.

An information window temporarily opens indicating that the feature key has been added and that rebooting is required.

7. Turn the topside off and then on again.

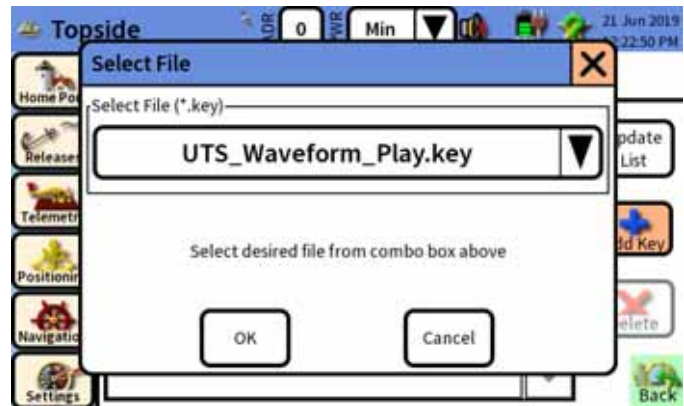


Figure 4-30 Features Tab—Select File Window

To delete an optional feature key:

1. Select Settings from the Menu bar, choose Topside, and then touch the Features tab.

The features tab opens as shown in Figure 4-25 on page 4-24.

2. Touch the Update List button to view the optional feature keys.
3. Select the optional feature key to delete.
4. Touch the Delete button.



Figure 4-31 Features Tab—Confirm Key Delete Window

The Confirm Key Delete window opens as shown in Figure 4-31.

5. Touch OK.
- The feature key is deleted.

Home Port Screen

The Home Port screen, which is shown in Figure 4-32, is a convenient starting point for many commonly performed topside operations. The screen is divided into two areas: User Presets/Favorites in the upper half and Recently Used in the lower half. When quick access to a pre-configured remote device or a recently viewed screen is desired, first open the Home Port screen by touching Home Port on the Menu bar, and then touch the corresponding button in the User Presets/Favorites or Recently Used area. Up to ten preset buttons can be created and up to ten recently used buttons will be automatically created when accessing various screens. An example of a Home Port screen with six preset buttons and ten recently used buttons is shown in Figure 4-33.

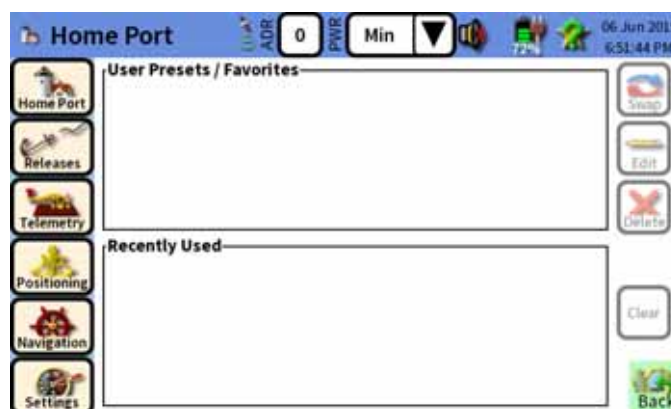


Figure 4-32 Home Port Screen

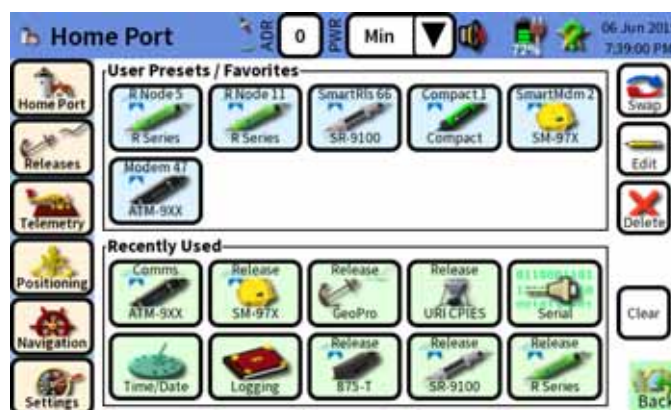


Figure 4-33 Home Port Screen with Preset and Recently Used Buttons

Adding Presets

Adding a preset creates a button in the User Presets/Favorites area of the Home Port screen that enables direct access at any time to the currently open screen and to all of its associated settings. Multiple preset buttons can be added, replaced, position swapped, and deleted. They can also be individually named, and the names can be changed at any time. The assigned name is displayed on the button. To go to the preset screen, touch the associated preset button. Any presets that are added, replaced, position swapped, or deleted are automatically saved. They do not require saving as a new default startup configuration.

To add a preset:

1. With the desired screen open, select Settings from the Menu bar and choose Add Preset.

The Add Preset window opens.

2. Touch Create New.

The preset keyboard opens as shown in Figure 4-34.

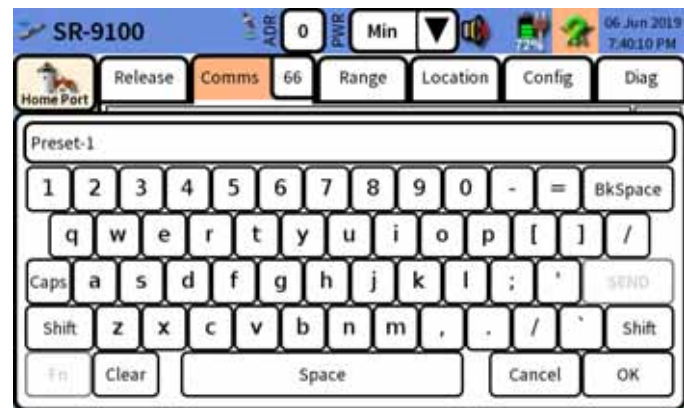


Figure 4-34 Preset Keyboard

3. Enter a name for the preset, a maximum of 12 characters, by touching the appropriate keys. The characters are displayed above the keyboard. A suggested name is already entered.

To clear all characters, touch Clear. To cancel the entry of the preset name and close the keyboard, touch Cancel.

4. Touch OK.

An information window temporarily opens indicating that the preset is saved. The preset button is also added in the User Presets/Favorites area of the Home Port screen as shown in Figure 4-35.

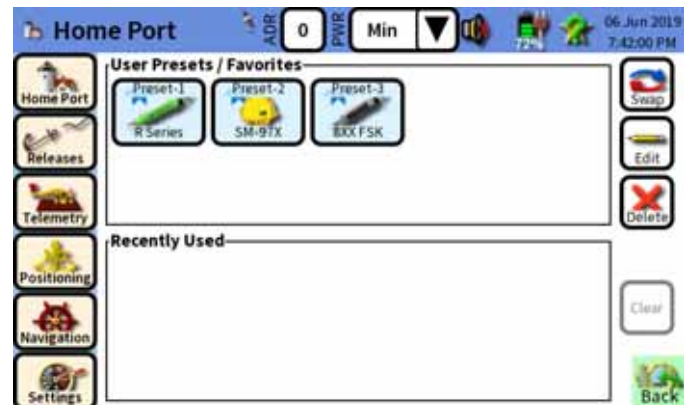


Figure 4-35 Preset Buttons

To change a preset name:

1. Touch the Edit button on the Home Port screen. To cancel, touch it again.
2. Touch the preset button for the preset to be edited.

The preset keyboard opens.

3. Enter the new name, and then touch OK.

The new name is displayed on the preset button.

To swap the positions of two preset buttons on the Home Port screen:

1. Touch the Swap button on the Home Port screen. To cancel, touch it again.
2. Touch the two preset buttons to be swapped, in either order.

The positions are swapped.

To delete a preset button:

1. Touch the Delete button on the Home Port screen. To cancel, touch it again.
2. Touch the preset button to be deleted.

The Delete Preset window opens.

3. Touch OK.

An information window temporarily opens indicating that the preset is removed, and the preset button is removed.

To replace a preset button with a new one:

1. With the desired screen open, select Settings from the Menu bar and choose Add Preset, or press and hold the Help/Preset control on the Status and Control bar.

The Add Preset window opens.

2. Touch Modify Existing.

The Home Port screen opens.

3. Touch the preset button to be modified.

The Overwrite Preset window opens.

4. Touch OK.

An information window temporarily opens indicating that the selected preset is being updated with the new one, and the preset button is replaced.

Accessing Recently Used Screens

Recently used screens are automatically saved as buttons in the Recently Used area of the Home Port screen, with the top leftmost button being the most recently added as shown in Figure 4-36. To access a recently used screen, touch the associated button. The recently used buttons can be deleted, but only as a group.

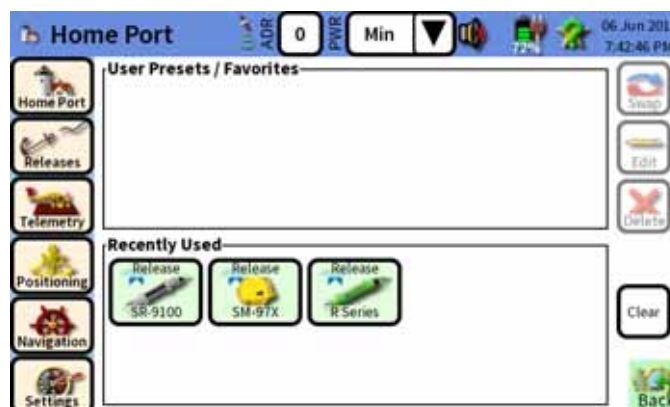


Figure 4-36 Recently Used Buttons

To delete the recently used buttons:

1. Touch the Clear button on the Home Port screen.

The Confirm Clear window opens.

2. Touch OK.

All the recently used buttons are deleted.

System Logging

Events and communications data can be optionally saved to separate log files. In addition, screenshots, survey results, waypoints, acoustic data, and errors are always saved, also to separate log files. If a GNSS is connected to the topside, the events entries can be geotagged. Events are actions performed by the operator; communications are acoustic telemetry exchanges between the topside and the remote devices; screenshots are screen captures of the touch screen display; surveys contain survey settings and data for device surveys; waypoints are all the system waypoints collected; acoustic data are one-second audio samples recorded at two different sampling rates; and errors identify any operational errors or system malfunctions. Once saved, the log files can be separately viewed, transferred to a USB flash drive or cleared.



NOTE Logging of events and communications data are enabled by default. The logging of screenshots, survey results, waypoints, acoustic data, and errors can never be disabled.

Enabling Automatic Logging of Events and Communications Data to Log Files

To enable automatic logging of events and communications data to log files:

1. Select Settings from the Menu bar, select System, and then choose Logging.

The Logging screen opens as shown in Figure 4-37.

2. Touch the Enable Logging button. The indicator on the button is lit when enabled.
3. In the Capture area touch the Events button to enable logging of events, or touch the Comms button to enable logging of communications. Touch both buttons to enable both. The indicator on the buttons is lit when enabled.

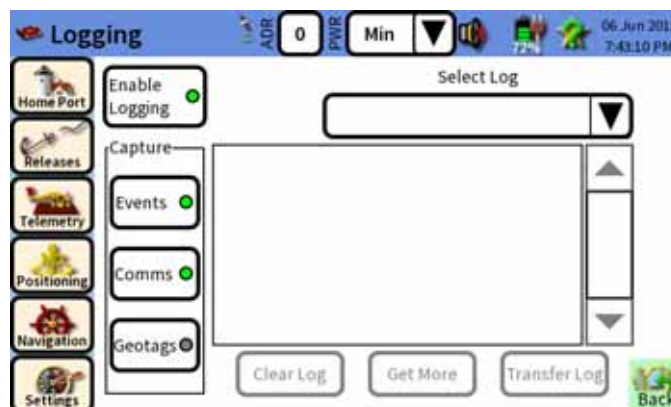


Figure 4-37 Logging Screen

Viewing the Log Files

The Events, Comms, and Errors log files can be viewed directly on the Logging screen. The other log file types will display files or item listings only and must be exported to be viewed.

To view the log files:

1. Select Settings from the Menu bar, select System, and then choose Logging.

The Logging screen opens as shown in Figure 4-37.

2. Touch the Select Log selection.

A drop-down list opens as shown in Figure 4-38.

3. Select the log to view from the drop-down list. To see the rest of the list, touch the down arrow.

The most recent 64 kbytes of log data will be available for viewing on the screen with the first line being the oldest data as shown in Figure 4-39. Tap the up or

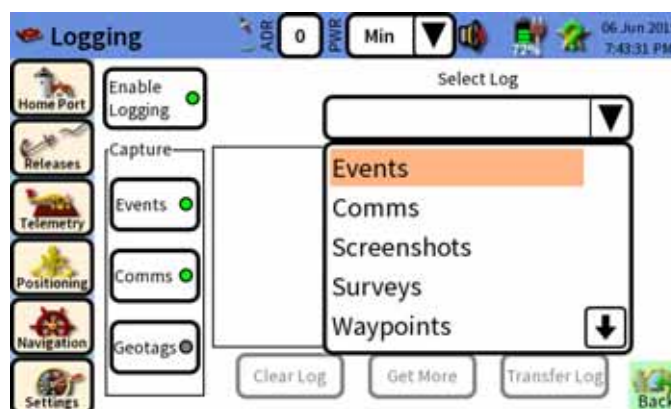


Figure 4-38 Logging Screen—Select Log Drop-Down List

down arrow or drag the slider up or down to scroll through the data. To add another 64 kbytes of data to view, touch the Get More button. The next most recent 64 kbytes of log data will be available for viewing on the screen with the first line being the oldest data. Repeat to go back further in time. The total bytes available for viewing and the total bytes in the log file are displayed on the screen. A

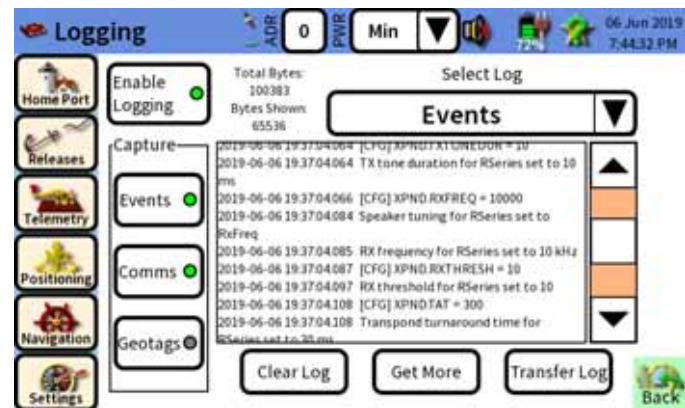


Figure 4-39 Logging Screen—Event Log Displayed

maximum of the most recent 512 kbytes of data can be viewed. To view more data, the logs must be transferred to a USB flash drive.

Clearing a Log File

To clear a log file:

1. Select Settings from the Menu bar, select System, and then choose Logging. The Logging screen opens as shown in Figure 4-37 on page 4-31.
2. Touch the Select Log selection. A drop-down list opens as shown in Figure 4-38 on page 4-31.
3. Select the log file to clear from the drop-down list.
4. Touch the Clear Log button. The log file is cleared.

Transferring a Log File

Any one or more of the log files can be transferred to a USB flash drive. The Events, Comms and Errors logs are each transferred as ASCII text files; the Screenshot logs are transferred as PNG files; the Survey logs are transferred as XML files; the Acoustic logs are transferred as WAV files; and the Waypoints log is transferred as separate XML and CSV files.

To transfer a log file:

1. Select Settings from the Menu bar, select System, and then choose Logging. The Logging screen opens as shown in Figure 4-37 on page 4-31.

2. Touch the Select Log selection.

A drop-down list opens as shown in Figure 4-38 on page 4-31.

3. Select the log file to transfer from the drop-down list.
4. Insert a USB flash drive into the USB connector.
5. Touch the Transfer Log button.

The log file is transferred to the USB drive and automatically named in accordance with the log type and date.

Geotagging the Log File Entries in the Events Log

The entries in the Events log can be geotagged. The geotags are composed of the current location of the topside and the time of the log entry. To geotag the Events log file entries, touch the Geotag button such that the indicator on the button is lit. When viewing the Events log, the events are geotagged as shown in Figure 4-40. As with all other system settings, this setting can be saved as the default startup configuration.

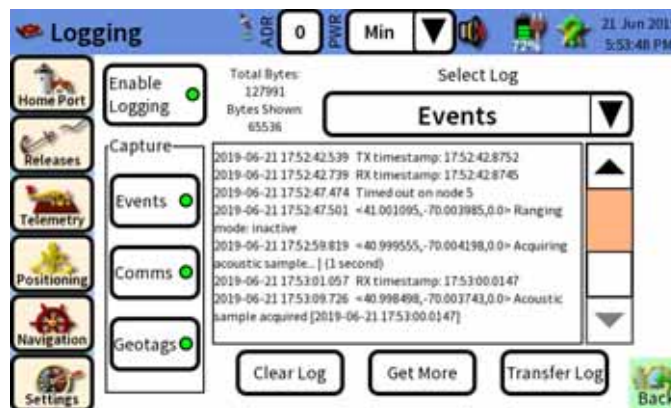


Figure 4-40 Logging Screen—Event Log Displayed with Geotags

Running Topside Diagnostic Checks

Once the topside is set up and the transducer is connected and deployed, a number of diagnostic checks that require only the topside or the topside and its transducer can be run. The checks consist of local acoustic power and noise level checks that help to evaluate the acoustic environment in which the transducer is deployed, topside power status checks, battery details checks, and printed circuit board temperature checks. In addition, an acoustic sample from the topside transducer can be recorded onto a USB flash drive.

Checking the Local Acoustic Power Levels

The relative acoustic power levels over the operating band of the topside in 250-Hz increments can be displayed to help identify any local sources of interference and their frequencies.

To check the local acoustic power levels:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

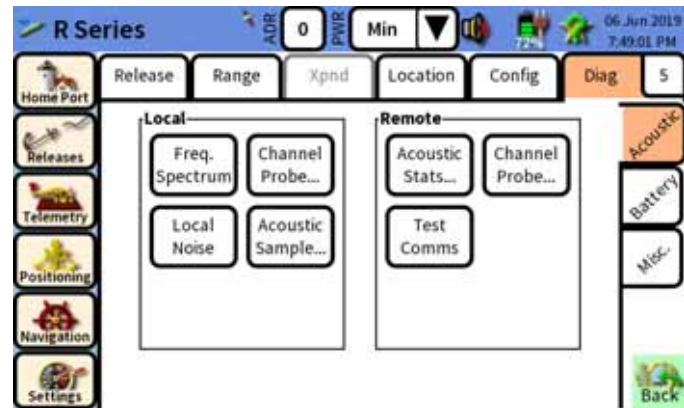


Figure 4-41 Diag/Acoustic Tab—R Series Release

2. Touch the Diag tab and then the Acoustic tab.

The Diag/Acoustic tab opens as shown in Figure 4-41. The one shown is for an R Series Release.

3. In the Local area of the Diag/Acoustic tab, touch the Freq. Spectrum button.

The Frequency spectrum window opens as shown in Figure 4-42.

The Frequency Spectrum window includes a bar graph, where the bars represent the received acoustic power level in dB in 250-Hz bins from 6.5 to 16.5 kHz for the 7–16 kHz

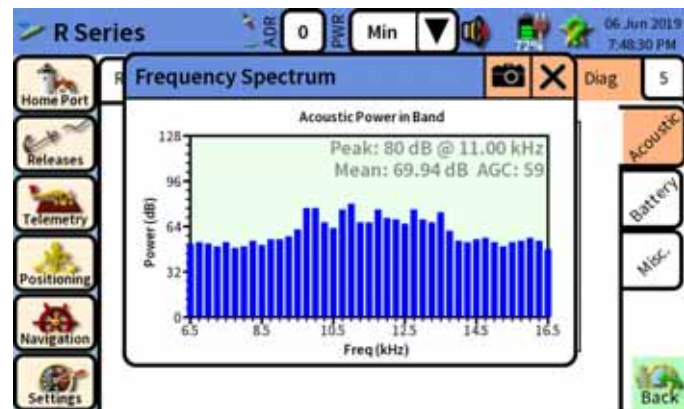


Figure 4-42 Frequency Spectrum Window

(WLF) UTS-9500 Universal Topside. The graph is updated twice a second, and for each update the peak power level and its frequency are displayed along with the mean power level over the entire frequency band. Peak power levels can help identify unwanted interference, such as that generated from boats, fish finders, altimeters and other acoustic sources.



NOTE The Freq. Spectrum button is also available in the Acoustic area on the Diag/Acoustic tab of the Topside screen. To get to this tab, select Settings from the Menu bar, choose Topside, touch the Diag tab, and then touch the Acoustic tab.

Checking the Local Acoustic Noise Levels

The relative acoustic noise levels over the operating band of the topside can be checked to help identify any local noise sources.

To check the local acoustic noise levels:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

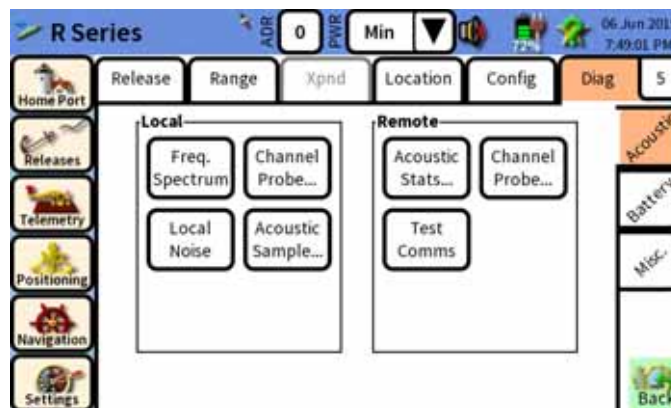


Figure 4-43 Diag/Acoustic Tab—R Series Release

2. Touch the Diag tab and then the Acoustic tab.

The Diag/Acoustic tab opens as shown in Figure 4-43. The one shown is for an R Series Release.

3. In the Local area of the Diag/Acoustic tab, touch the Local Noise button.

The Local Noise Environment window opens as shown in Figure 4-44.

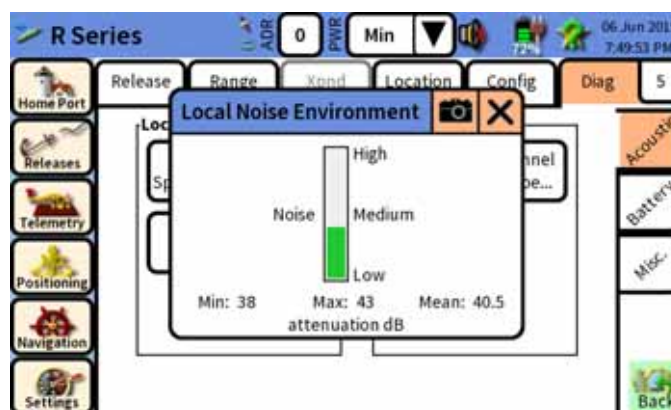


Figure 4-44 Local Noise Environment Window

The Local Noise Environment window includes a pillbox indicator representing the average background noise level at the transducer. The indication is based on the automatic gain control (AGC) attenuation in dB, where the higher the attenuation the higher the noise level. The values under the display are the minimum (Min), the maximum (Max) and the mean (Mean) AGC attenuations over a 1-second sample period with the Mean value corresponding to the pillbox indication. The values are updated once per second.



NOTE The Local Noise button is also available in the Acoustic area on the Diag/Acoustic tab of the Topside screen. To get to this tab, select Settings from the Menu bar, choose Topside, touch the Diag tab, and then touch the Acoustic tab.

Recording an Acoustic Sample

A one-second sample of audio from the topside transducer can be recorded as a pair of signed 16-bit little endian WAV files, one containing 96 kHz real samples and the other containing 10240 Hz basebanded real and imaginary (I+Q) samples. Once collected, the audio files can be transferred to a USB flash drive. The sample files are named based upon the time of collection.

To record an acoustic sample:

1. Select Settings from the Menu bar, and then choose Topside.
2. Touch the Diag tab and then the Acoustic tab.

The Diag/Acoustic tab opens as shown in Figure 4-45.

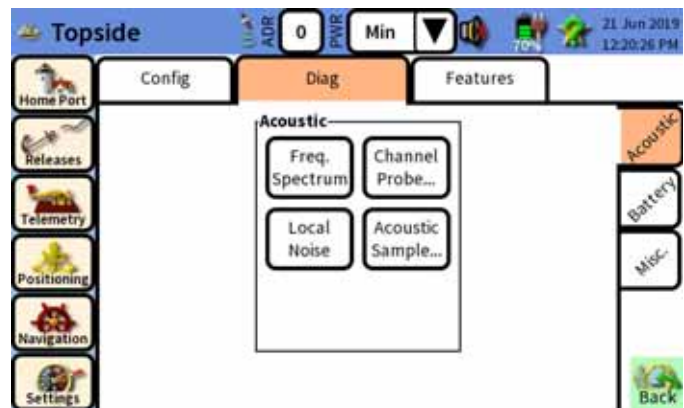


Figure 4-45 Topside Screen—Diag Tab

3. Touch the Acoustic Sample button.

The Acoustic Sample window opens as shown in Figure 4-46.

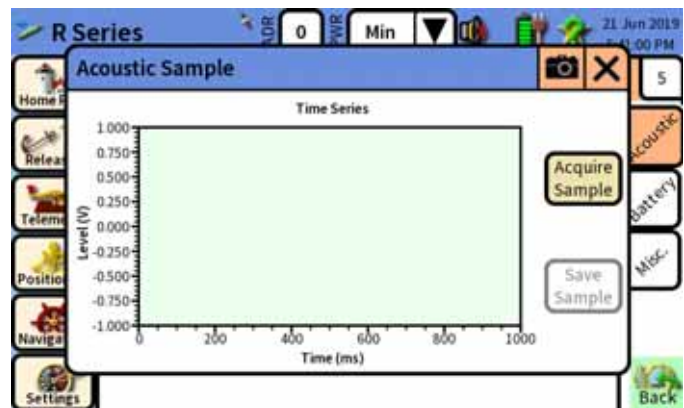


Figure 4-46 Acoustic Sample Window



NOTE The Acoustic Sample button is also available in the Local area on the Diag/Acoustic tab of the device screen for a remote device. To get to this tab, select Telemetry or Releases from the Menu bar, choose the remote device, touch the Diag tab, and then touch the Acoustic tab.

4. Touch the Acquire Sample button.

An information window temporarily opens indicating that a one-second sample is being acquired followed by another information window indicating that the sample has been acquired. When this window closes, the acoustic sample is displayed as shown in Figure 4-47.

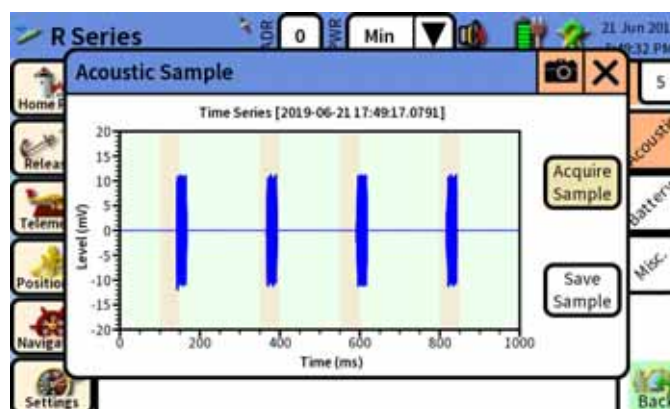


Figure 4-47 Acoustic Sample Window with Acoustic Sample Displayed

5. Touch the Save Sample button.

An information window opens indicating that the data are being transferred followed by another information window indicating the File Names of the Two Acoustic Sample WAV Files as shown in Figure 4-48.

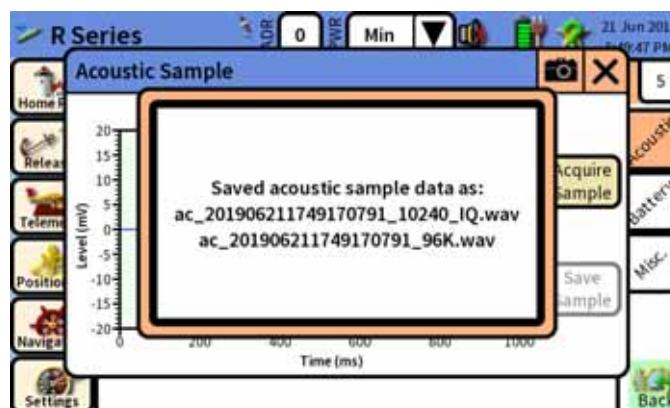


Figure 4-48 File Names of the Two Acoustic Sample WAV Files

Checking the Topside Power Status

The board voltage and the remaining capacity of the topside battery can be checked. The board voltage is the voltage that is powering the topside regardless whether it is running on its battery or AC power. The check also indicates whether the topside is running on its battery or running on external power and charging.

To check the topside power status:

1. Select Settings from the Menu bar and then choose Topside.
2. Touch the Diag tab and then the Battery tab.

The Diag/Battery tab opens as shown in Figure 4-49.

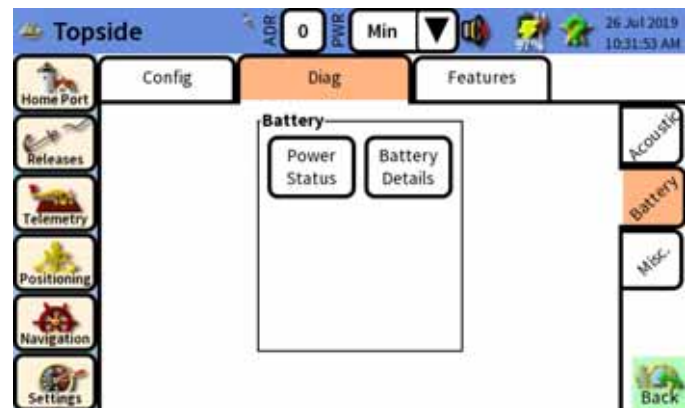


Figure 4-49 Topside Screen—Diag/Battery Tab

3. In the Battery area of the Diag/Battery tab, touch the Power Status button.

An information window temporarily opens displaying the topside power status as shown in Figure 4-50.

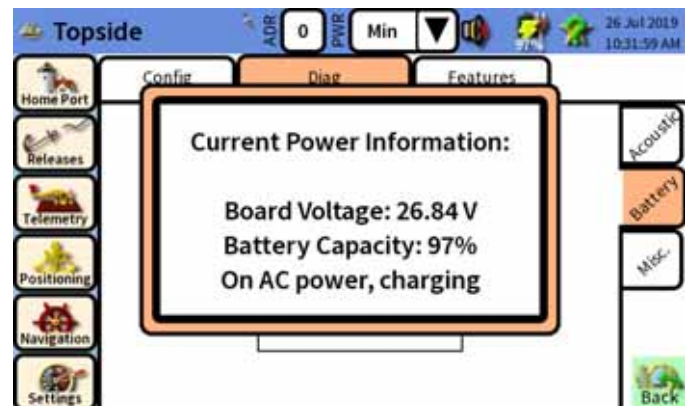


Figure 4-50 Topside Power Status Displayed

Checking the Topside Battery Details

The topside battery can be checked. The details are composed of the battery number, current charge level, voltage, current draw, time to discharge, temperature, manufacture date, and serial number.

To check the topside battery details:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

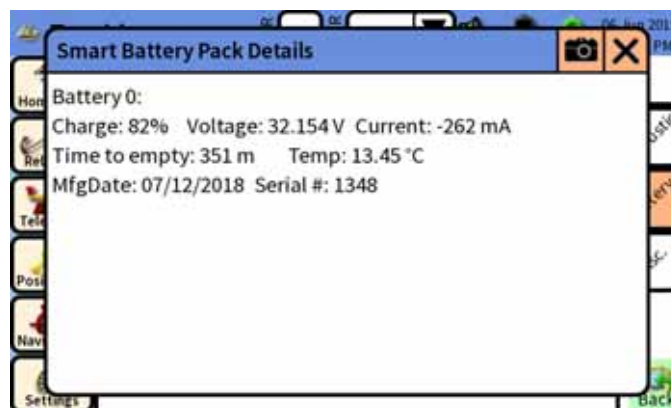


Figure 4-51 Smart Battery Pack Details Window

2. Touch the Diag tab and then the Battery tab.

The Diag/Battery tab opens as shown in Figure 4-49 on page 4-38.

3. In the Local area of the Diag/Acoustic tab, touch the Battery Details button.

The Smart Battery Pack Details window opens as shown in Figure 4-51.

Checking the Printed Circuit Board Temperatures

Two temperature sensors on the printed circuit boards inside the topside measure the temperature of the boards. Should the temperature exceed 80°C (176°F), transmissions will be automatically disabled until the boards have cooled.

To check the printed circuit board temperatures:

1. Select Settings from the Menu bar and then choose Topside.
2. Touch the Diag tab and then the Misc tab.

The Diag/Misc tab opens as shown in Figure 4-52.

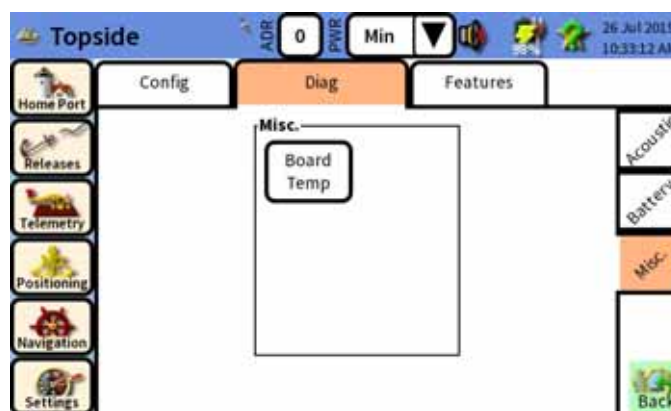


Figure 4-52 Topside Screen—Diag/Misc Tab

3. In the Misc area of the Diag/Misc tab, touch the Board Temp button.

An information window temporarily opens indicating the board temperatures are being read, and then another information window opens displaying the board temperatures as measured by two temperature sensors as shown in Figure 4-53.

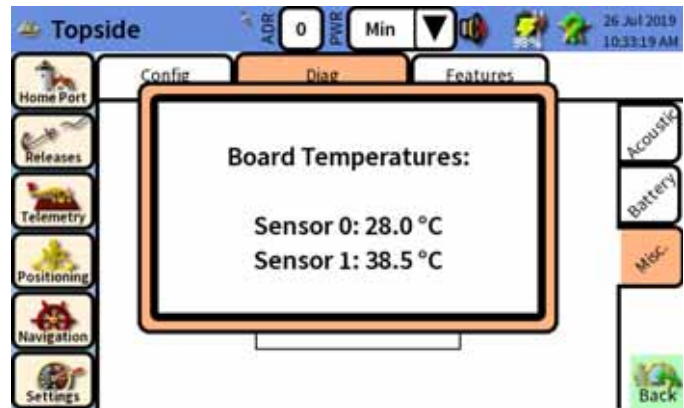


Figure 4-53 Topside Printed Circuit Board Temperatures Displayed

Configuring the Topside for Communications

Before communications with a remote device can be performed, a number of topside settings must be made for the device. These settings are the transmit header rate, the transmit data rate, the acoustic timeout, the domain key, and the address of the remote device. In addition, whether to use wake tones in the transmissions and whether to enable automatic header detection should be selected. Not all of these settings will be available for all devices.

Configuring the Transmit Header Rate and Transmit Data Rate of the Topside

To configure the transmit header rate and transmit data rate of the topside:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

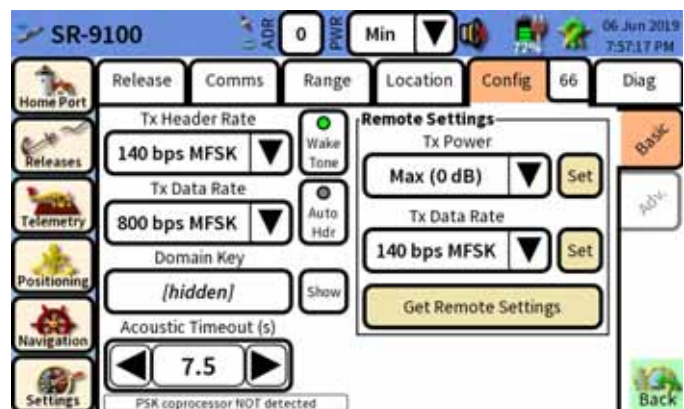


Figure 4-54 Config Tab—SR-9100 SMART Release

2. Touch the Config tab.

The Config tab opens as shown in Figure 4-54. The one shown is for an SR-9100 SMART Release.

3. Touch the Tx Header Rate setting and select the transmit header rate and modulation technique.

The transmit header rate and modulation technique must be the same as that configured for the remote device, unless the remote device is configured for automatic header detection. If the remote device is configured for automatic header detection, make the preferred choice.

4. If required, touch the Auto Hdr button such that the indicator on the button is lit to communicate with a remote device that has a different transmit header rate. The remote device must also have been configured for automatic header detection.

5. Touch the Tx Data Rate setting and select the transmit data rate.

6. If required, touch the Wake Tone button such that the indicator on the button is lit to transmit a lowpower wakeup signal when transmitting data to a remote device.

The lowpower wakeup signal will wake up all the devices within range that are in the lowpower state.

Configuring the Acoustic Timeout of the Topside

The acoustic timeout is the time that the topside will wait for a response from a remote device.

To configure the acoustic timeout of the topside:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

2. Touch the Config tab.

The Config tab opens as shown in Figure 4-54 on page 4-40. The one shown is for an SR-9100 SMART Release.



NOTE The timeout should be set in accordance with the expected *slant* range or longer. The *minimum* timeout, even when operating in air with the transducers placed next to each other, is 3 seconds. The *recommended* timeout should be used when acquiring slant range.

3. Tap or touch and hold the Acoustic Timeout setting to select the topside timeout in seconds. The *minimum* setting should be in accordance with the expected *slant* range as shown in Table 4-2.

Table 4-2 Minimum Timeout Setting Versus Expected Slant Range

EXPECTED SLANT RANGE (km)	MINIMUM TIMEOUT (sec)	RECOMMENDED TIMEOUT (sec)
3.0	4.0	6.0
7.5	10.0	12.0
10	13.5	16.5
15	20.0	23.0

Entering a Domain Key for the Topside

To extend the number of addresses beyond the 250 address limit or to prevent unauthorized operation, or both, of some of the remote devices, an option to enter a domain key consisting of up to 12 characters is available. The same domain key can be entered for up to 250 remote devices and the topsides to be used to communicate with them, thus creating one unique domain group. With the 12-character domain key, several billion such unique domains can be used. With this feature only topsides that have the same domain key as the remote devices can communicate with them. The domain key for the topside is entered on the Config tab for the remote device.



NOTE The domain key feature is not available for an 8XX FSK Acoustic Release or an 875-T Series Release, as these remote devices are not domain key capable. In addition, the domain key must be null to communicate with these remote devices. A null domain key is equivalent to no domain key at all.



NOTE For instructions on how to create the domain key for a remote device, refer to the user's manual for the device.

To enter a domain key for the topside:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

2. Touch the Config tab.

The Config tab opens as shown in Figure 4-55. The one shown is for an R Series Release.

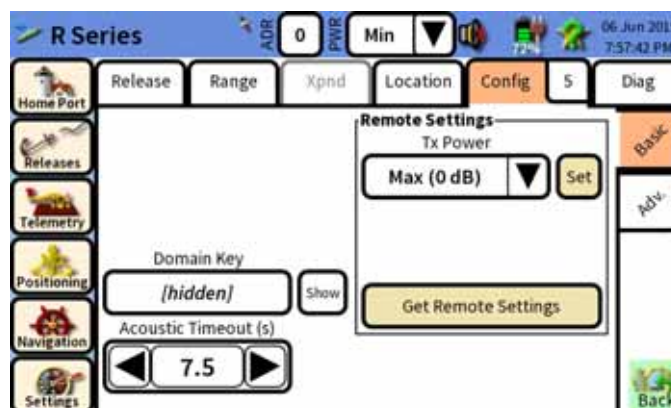


Figure 4-55 Config Tab—R Series Release

3. To show the domain key after it is entered, touch the Show button; to hide the domain key, touch the Hide button.
4. Touch the Domain Key setting.

The domain key keyboard opens as shown in Figure 4-56.

5. Enter the domain key, a maximum of 12 characters, by touching the appropriate keys. The domain key is case sensitive. The characters are displayed above the keyboard as shown in Figure 4-57.

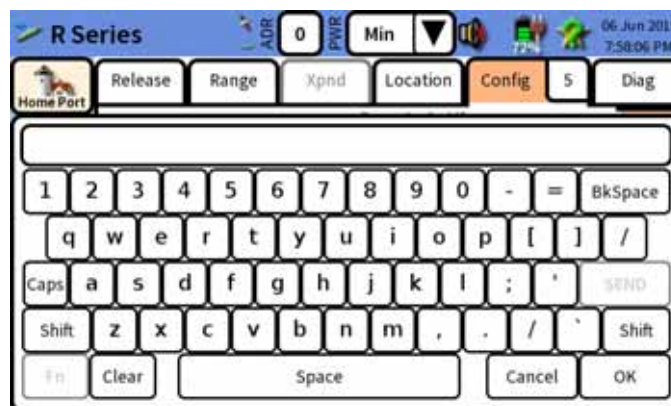


Figure 4-56 Domain Key Keyboard

To cancel the entry of the domain key and close the keyboard, touch Cancel. To change to a null domain key if a domain key has been previously created, touch Clear.

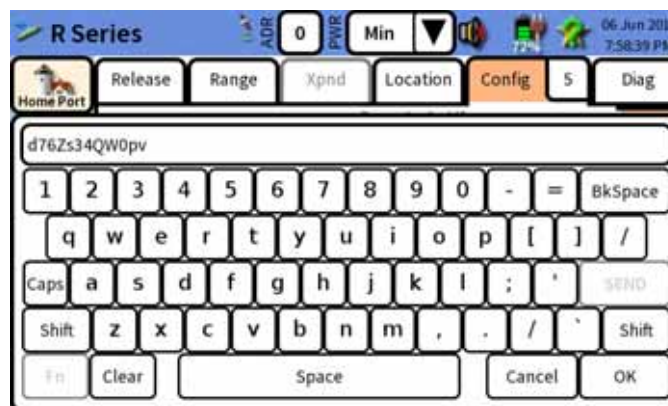


Figure 4-57 Domain Key Entered

6. Touch OK.

If applicable, the Domain Key Complexity Warning screen opens warning against entry of certain characters. Touch OK to accept the entry anyway, or touch Discard.

The keyboard closes, and the domain key is displayed if selected to do so as shown in Figure 4-58.

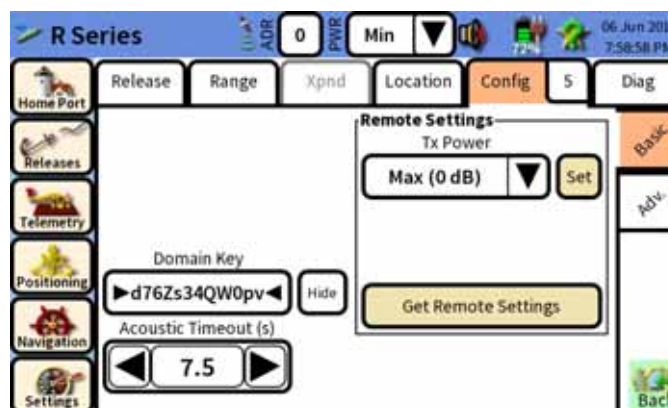


Figure 4-58 Domain Key Displayed



NOTE Should the domain key be lost, contact Teledyne Benthos.

Selecting the Address of a Remote Device

Before communications with a remote device can be performed, its address must be selected.

To select the address of a remote device:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

2. For a modem touch the address setting inside the Comms tab. Similarly, for a release touch either one of the two remote address settings as shown in Figure 4-59, which is the Release tab for an SM-97X SMART Modem.

An address keypad opens as shown in Figure 4-60, which is for the Release tab.

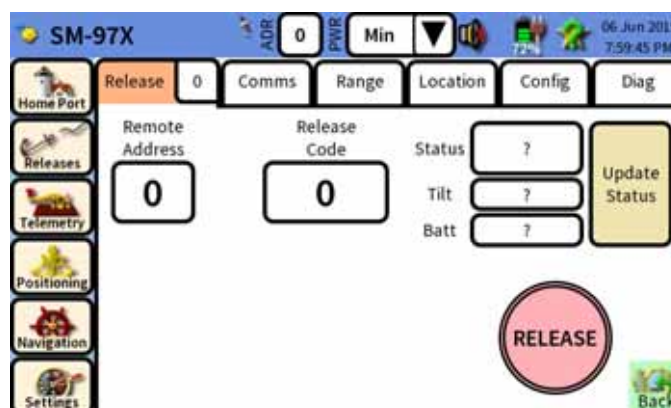


Figure 4-59 Release Tab—SM-97X SMART Modem

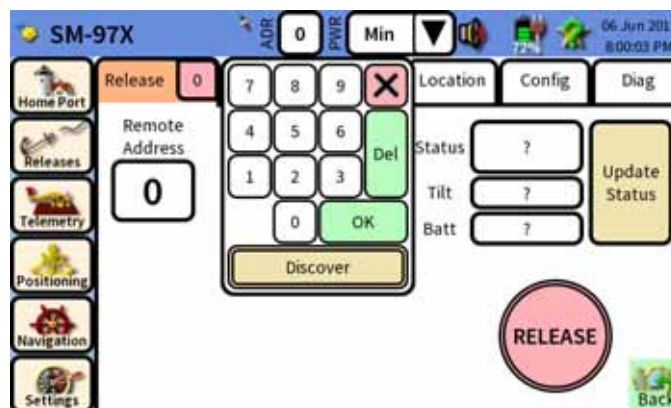


Figure 4-60 Address Keypad



NOTE The address keypad can be opened from any currently open tab by touching the address setting inside the tab.

3. Enter the address of the remote device, three characters maximum, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the device address setting is displayed inside the tab.

Waking/Activating/Hibernating an R Series

An R Series Release will automatically go into hibernate at a specific time after it has been switched on. This is the power on time and is factory set to 6 hours. If the R Series Release is in hibernate, it must first be awakened and then activated before it can be released or its status checked. The R Series Release can be awakened and activated by acoustic command. It can also be placed into hibernate by acoustic command, which should be done after deploying it and checking its status.



NOTE Before attempting to hibernate, wake up or activate an R Series Release, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

Waking up and Activating an R Series Release

To wake up and activate the R Series Release:

1. Touch the Release tab.
The Release tab opens.
2. If desired, tap or touch and hold the up or down arrow of the Activation setting to select the number of hours the R Series Release will remain active before going into hibernate again.
3. Touch the Send Wakeup button such that the indicator on the button is lit.



NOTE Activating an R Series Release *without* the Send Wakeup button indicator being lit will set the activation hours of the R Series Release to that of the Activation setting on the Release tab, but *only* if the R Series Release is *not* in hibernate. If it *is* in hibernate, nothing happens.

4. Touch—and hold—the Activate button.

Three short beeps followed by a long beep will be heard over about two seconds, and then the button will become highlighted.

Releasing the Activate button at any time before the last beep will abort the command. After the button is highlighted, sliding the finger completely off the button while maintaining contact with the touch screen display will also abort

the command. If the command successfully aborts, an information window will temporarily open with the message "Transmission aborted."

5. Release the Activate button.

An information window temporarily opens with the message "Sending activation request to node <remote device address>." The wakeup signal is sent which requires one full minute to transmit and will temporarily wake each R Series Release within range. Then an information window temporarily opens with the message "Activating...." When activated, another window temporarily opens with the message "R Series Activated." Only the R Series Release that is commanded to activate will activate. The others will return to hibernate. If activation is not confirmed, an information window temporarily opens with the message "No response received from node <remote device address>."

6. To verify that the R Series Release is active, touch Status.

The status information should be displayed on the Release tab.

Hibernating an R Series Release

To hibernate an R Series Release:

1. Touch the Release tab.

The Release tab opens.

2. Touch—and hold—the Hibernate button.

Three short beeps followed by a long beep will be heard over about two seconds, and then the button will become highlighted.

Releasing the Hibernate button at any time before the last beep will abort the command. After the button is highlighted, sliding the finger completely off the button while maintaining contact with the touch screen display will also abort the command. If the command successfully aborts, an information window will temporarily open with the message "Transmission aborted."

3. Release the Hibernate button.

An information window temporarily opens with the message "Sending hibernation request to node <remote device address>." When hibernated, another window temporarily opens with the message "R Series Hibernated." If hibernate is not confirmed, an information window temporarily opens with the message "No response received from node <remote device address>."

4. To verify that the R Series Release is in hibernate, touch Update Status.

An information window should temporarily open with the message "No response received."

Hibernating or Activating every R Series Release in Range

A special address, the broadcast address, can be used to hibernate or to activate every R Series Release that is within acoustic range of the UTS-9500 transducer that is used to transmit to them. The broadcast address is 255. However, when this address is used, no acknowledgments will be received. In addition, the broadcast address can be used to attempt to determine the address of an R Series Release by checking its status. If a response is received, it will include its address along with the status information.



NOTE When checking status of an R Series Release using the broadcast address, the address and status of the closest R Series Release are the most likely to be received. Furthermore, if there are two or more of them that are of equal slant range and they are the closest, it is possible that no information will be received.

To hibernate or to activate every R Series Release within range, or to attempt to determine the address of an R Series Release, perform the same steps that are used to hibernate an R Series Release as described in "Waking/Activating/Hibernating an R Series" on page 4-46 or to acquire the status of a specific R Series Release as described in "Acquiring and Displaying Status Information" on page 4-53. Use the broadcast address 255. Should status information be received, the address of the R Series Release will be displayed in the information window acknowledging its receipt.

Waking up a Compact Modem or 875-T

The Compact Modems and 875-T Series Release use the same Wakeup scheme. Therefore the description of the Compact Modem also applies equally to the 875-T Series Release. Compact Modems are designed for long deployment; they are in a low power state most of the time. While in this low power state, a Compact Modem will not be able to receive commands or transmit messages. The modem must be awakened first before it can perform these functions.

There are two wakeup schemes, "slow" and "fast." The slow wakeup scheme is implemented in all UTS-9500 Universal Topsides and in 875-T Series Releases with firmware versions prior to 1.2.7. The fast wakeup scheme is also implemented in all UTS-9500 Universal Topsides and in 875-T Series Releases with firmware versions 1.2.7 and higher. Table 4-3 summarizes which firmware versions provide which wakeup scheme.

Table 4-3 875-T Series Releases Versus Slow and Fast Wakeup Schemes

875-T Series Release and Firmware Version	SLOW	FAST
875-T Series Release (prior to 1.2.7)	•	
875-T Series Release (1.2.7 and higher)		•

Selecting the Slow or Fast Wakeup Scheme for an 875-T Series Release

To select the slow or fast wakeup scheme for an 875-T Series Release:

1. Select Releases from the Menu bar, and then choose 875-T.

The 875-T screen opens to the Release tab.

2. Touch the Config tab, and then touch the Wake tab.

The Config/Wake tab opens as shown in Figure 4-61.

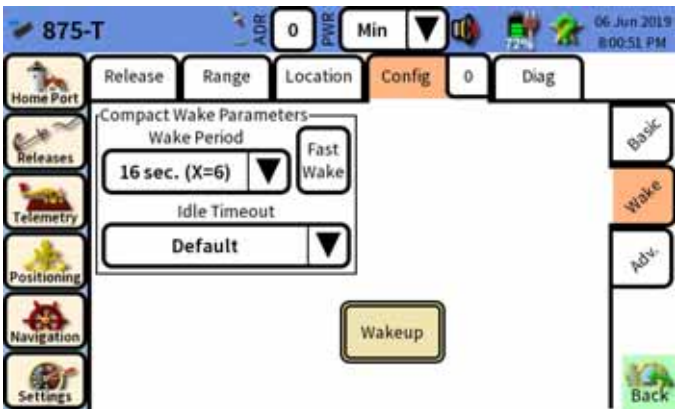


Figure 4-61 Config/Wake Tab

3. If the fast wakeup scheme is currently selected, this condition is indicated on the Config/Wake tab by the Fast Wake button. Touch this button to select the slow wakeup scheme. If the button indicates Slow Wake, touch the button to select the fast wakeup scheme.

Selecting the Wake Period for an 875-T Series Release

The UTS-9500 wakes up a 875-T Series Release by transmitting a wakeup signal. Although a 875-T Series Release is in its low power state most of the time, it will periodically listen for this signal. The time during which a 875-T Series Release listens for the wakeup signal is the wakeup period and is preset by the user. The wakeup period must first be selected before the topside can be used to wake up a 875-T Series Release.

To select the wakeup period for an 875-T Series Release:

1. Select Releases from the Menu bar, and then choose 875-T.

The 875-T screen opens to the Release tab.

2. Touch the Config tab, and then touch the Wake tab.

The Config/Wake tab opens as shown in Figure 4-61 on page 4-49.

3. Determine what the wakeup period setting is for the 875-T Series Release to be awakened.

4. In the Compact Wake Parameters area, Touch the Wake Period setting.

A drop-down list opens as shown in Figure 4-62.

5. Select the wake period from the drop-down list.

The drop-down list closes and the selection is displayed.

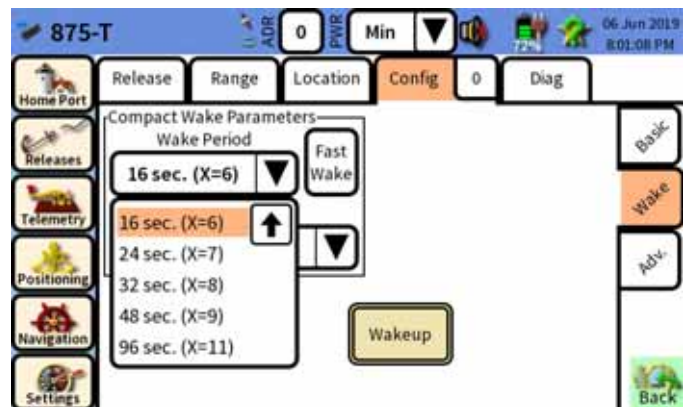


Figure 4-62 Wake Period Drop-Down List



NOTE The 2 sec. wakeup period setting is compatible with the slow wakeup scheme only. Similarly, the 96 sec. wakeup period setting is compatible with the fast wakeup scheme only. All of the other wakeup period selections are compatible with both wakeup schemes. If a non-matching wakeup scheme is selected, the 875-T Series Release may, or may not, wake up when the wakeup signal is transmitted. There is no guarantee one way or the other.

After a wakeup signal is transmitted to the 875-T Series Release as described in "Transmitting a Wakeup Signal to a Compact Modem or 875-T Series Release" on page 4-52, the duration of the transmission sequence will be set such that it will be present when the 875-T Series Release listens for it. The longer the wakeup period, the longer the sequence.

Selecting the Idle Timeout for a Remote Compact Modem or 875-T Series Release

The idle timeout is the time after which a remote device will go into the lowpower state if there is no input either from its host processor over the serial interface or from a remote device over the acoustic link. Beginning with the Compact Modem firmware version 1.2.8, the idle timeout for a remote Compact Modem can be selected. Prior to version 1.2.8, a fixed idle timeout of three minutes was used and could not be changed.

The range of allowable values for the idle timeout is from 15 to 90 minutes in 15-minute intervals. The default timeout of 3 minutes can also be selected.

To select the idle timeout for a Compact Modem or 875-T Series Release:

1. For a Compact Modem, select Telemetry from the Menu bar, and then choose Compact. For an 875-T Series, select Releases, and then choose 875-T.

For a Compact Modem, the Compact Modem screen opens to the Comms tab; for an 875-T Series Release, the 875-T screen opens to the Release tab.

2. Touch the Config tab, and then touch the Wake tab.

The Config/Wake tab opens as shown in Figure 4-61 on page 4-49.

3. In the Compact Wake Parameters area, touch the Idle Timeout setting.

A drop-down list opens as shown in Figure 4-63.

4. Select the idle timeout from the drop-down list.

The drop-down list closes and the selection is displayed.

After a wakeup signal is transmitted to the Compact Modem or 875-T Series Release as described in "Transmitting a Wakeup Signal to a Compact Modem or 875-T Series Release" on page 4-52, the idle timeout will be set.

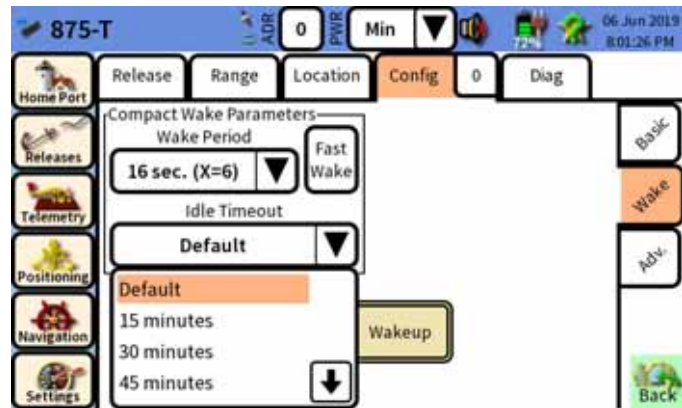


Figure 4-63 Idle Timeout Drop-Down List

Transmitting a Wakeup Signal to a Compact Modem or 875-T Series Release

To ensure that when transmitting the wakeup signal to a Compact Modem or 875-T Series it will wake up, select the wakeup period for the modem as described in "Selecting the Wake Period for an 875-T Series Release" on page 4-50.

To transmit a wakeup signal to a Compact Modem or 875-T Series Release, touch the Wakeup button. The Wakeup button is available on the Config/Wake tab as shown in Figure 4-61 on page 4-49.

The wakeup signal is transmitted and an information window temporarily opens during the duration of the transmission sequence as shown in Figure 4-64. The window also displays the length of the sequence in seconds. If the modem is not awakened, a no response indication is displayed in an information window.

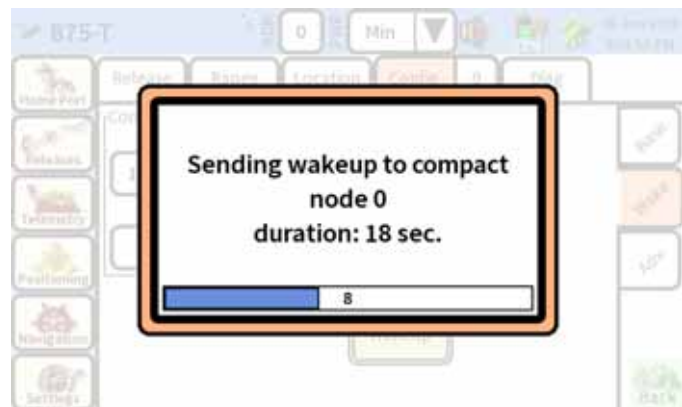


Figure 4-64 Waking up a Compact Modem or 875-T Series Release

Acquiring and Displaying Status Information

Status information can be acquired and displayed at any time from an R Series Release, an SM-97X SMART Modem, an SR-9100 SMART Release, or an 875-T Series Release. Before attempting to acquire and to display status information from a remote device, always ensure that the transducer is connected.



NOTE Before attempting to acquire and to display status information from a remote device, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

To acquire and display status information from a remote device:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

2. If a modem was selected, touch the Release tab.

3. Touch the Update Status button.

The status command is sent and an information window temporarily opens indicating that the status is being requested. When the status information is acquired, it's receipt is acknowledged in another information window.

If the remote device is not the one selected, an information window will open indicating the correct device and that the status information should be requested from its device screen.

4. When the window closes, the status information is displayed on the Release tab as shown in Figure 4-65.

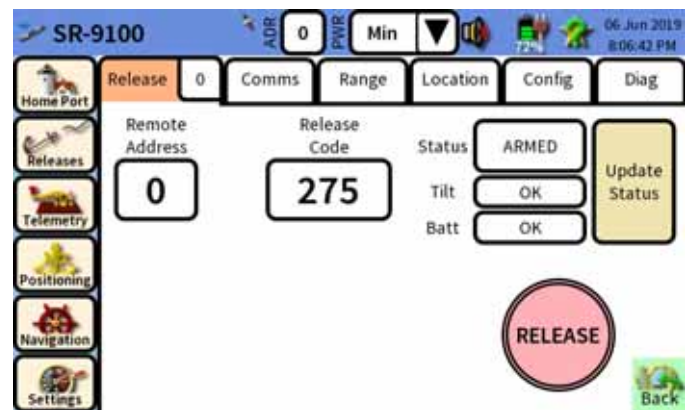


Figure 4-65 Release Tab with Displayed Status Information

Releasing a Remote Device

The topside can be used to release any Teledyne Benthos manufactured acoustic release or modem, including legacy 8XX FSK Acoustic Releases and releases manufactured by EdgeTech, URI and GeoPro. Before attempting to release a remote device, always ensure that the transducer is connected.

Releasing an R Series Release

To release an R Series Release:

1. Select Releases from the Menu bar, and then choose R Series.

The R Series screen opens to the Release tab as shown in Figure 4-66.

2. Touch the address setting inside the Release tab or touch the Remote Address setting.

An address keypad opens.

3. Enter the address of the R Series Release, three characters maximum, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the device address setting is displayed inside the tab and as the Remote Address setting.

4. Touch the Release Code setting.

The release code keypad opens.

5. Enter the release code of the R Series Release, five characters maximum, and then touch OK. To backspace and delete a character, touch the Delete pad.

The keypad closes and the release code is displayed as the Release Code setting.

6. Touch the Send Wakeup button such that the indicator on the button is lit.

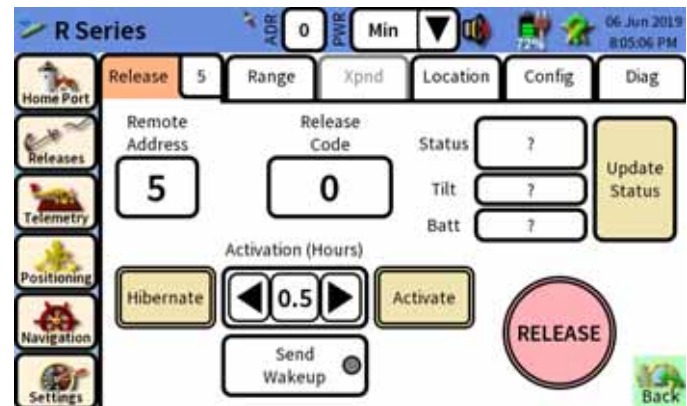


Figure 4-66 R Series Screen—Release Tab



NOTE Waking up and activating the R Series Release is only necessary if it is hibernating. If it *is not* hibernating, the R Series Release can be released without first activating it. If it *is* hibernating, it can be activated first as instructed in Steps 7 and 8, or it can be released directly. To release directly, skip to Step 9. The topside will automatically wake up the R Series Release before sending the release command. In both cases the indicator on the Send Wakeup button must be lit.

7. Touch—and hold—the Activate button.

Three short beeps followed by a long beep will be heard over about two seconds, and then the button will become highlighted.

8. Release the Activate button.

An information window temporarily opens with the message "Sending activation request to node <remote device address>." When activated, an information window temporarily opens with the message "R Series Activated." Activation will take over a minute to complete. If no response is received, the message "No response received from node <remote device address>" will be displayed.



CAUTION Before proceeding with the next step, verify that the release code is correct.

9. Touch—and hold—RELEASE.

Three short beeps followed by a long beep will be heard, and then the RELEASE button will become highlighted.



NOTE The command will be sent only after the RELEASE button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the RELEASE button. The RELEASE button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

10. Release the RELEASE button.

An information window temporarily opens with the message "Transmitting code to node <remote device address>." If the correct code is received, the release

mechanism will activate, and when the release pin is fully retracted, an information window will temporarily open with the message "Release Confirmed." When the window closes, "Release CONFIRMED," will be displayed on the Release tab.

If the release code is incorrect, the message "Invalid Release Code" will be displayed. If no response is received, the message "No response received from node <remote device address>" will be displayed.

If an information window temporarily opens with the message "Released and NOT confirmed," the release mechanism has been activated but the R Series Release has not released itself from its mooring. When the window closes, "Released & unconfirmed," will be displayed on the Release tab.

Releasing an SM-97X SMART Modem, an SR-9100 SMART Release or an 875-T Series Release

To release an SM-97X SMART Modem, an SR-9100 SMART Release or an 875-T Series Release:

1. Select Releases from the Menu bar, and then choose the remote device.
2. The device screen opens to the Release tab as shown in Figure 4-67 for the SR-9100 SMART Release.

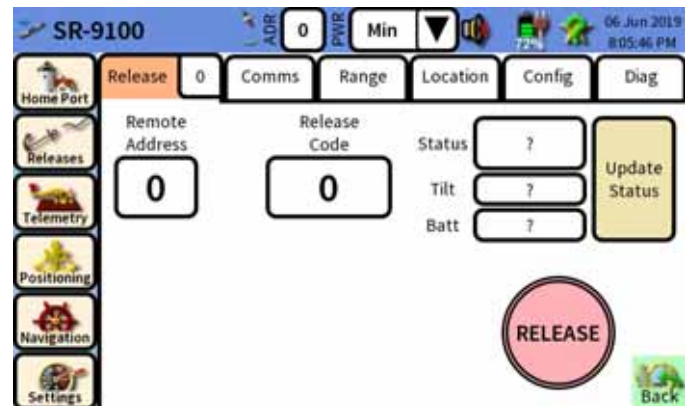


Figure 4-67 SR-9100 Screen—Release Tab

3. Touch the address setting inside the Release tab or touch the Remote Address setting.

An address keypad opens.

4. Enter the address of the remote device, three characters maximum, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the device address setting is displayed inside the tab and as the Remote Address setting.

5. Touch the Release Code setting.

The release code keypad opens.

6. Enter the release code of the remote device, five characters maximum, and then touch OK. To backspace and delete a character, touch the Delete pad. The keypad closes and the release code is displayed as the Release Code setting.



CAUTION Before proceeding with the next step, verify that the release code is correct.

7. Touch—and hold—RELEASE.

Three short beeps followed by a long beep will be heard, and then the RELEASE button will become highlighted.



NOTE The command will be sent only after the RELEASE button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the RELEASE button. The RELEASE button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

8. Release the RELEASE button.

The release command is sent and an information window temporarily opens with the message "Transmitting code to node <remote device address>." This message should be followed by "Valid release code, waiting for confirmation..." for an SR-9100 SMART Release or an 875-T Series Release, or "Valid burn wire code, burn started..." for an SM-97X SMART Modem. If the release code is incorrect, the message "Invalid Release Code" will be displayed, instead.

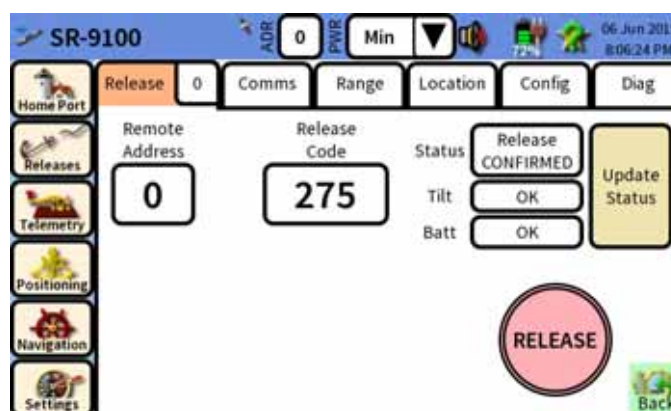


Figure 4-68 Released CONFIRMED—SR-9100 SMART Release

For an SR-9100 SMART Release or an 875-T Series Release, if the correct release code was received, the message "Released CONFIRMED," will be displayed on the Release tab as shown in Figure 4-68. This message

acknowledges that the release mechanism has been activated and that the release has released itself from its mooring. If instead, the message "Released & unconfirmed" is displayed, the release mechanism has been activated but the release has not released itself from its mooring.

For an SM-97X SMART Modem, if the correct release code was received, the message "Burn wire ACTIVATED," will be displayed on the Release tab as shown in Figure 4-69. Once the burn wire has fully burned, which typically takes about 10 minutes but could take as long as 30 minutes depending on the salinity of the water, the Burn Wire Notification window will open indicating that the burn is complete. Touch the X mark to close the window. The message "Burn wire RELEASED" should be displayed on the Release tab.

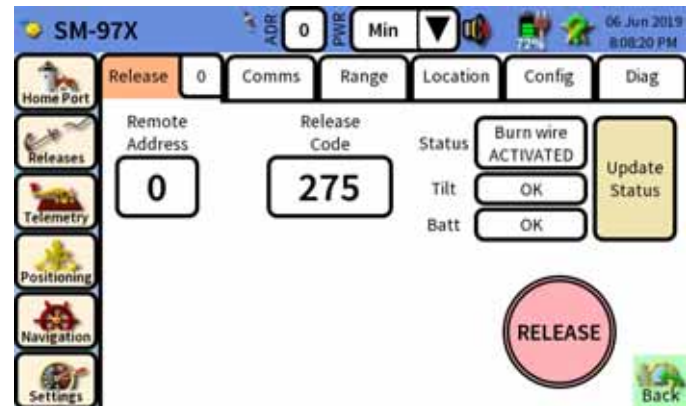


Figure 4-69 Burn Wire Activated—SM-97X SMART Modem

If desired, after sending the release command, ranges can be acquired and displayed by touching Range on the Range tab. Refer to "Acquiring and Displaying the Range to a Remote Device" on page 4-65 for detailed instructions.

Releasing an 8XX FSK Acoustic Release

An 8XX FSK Acoustic Release includes an 865A, an 875-PUB and other legacy Teledyne Benthos releases.

To release an 8XX FSK Acoustic Release:

1. Select Releases from the Menu bar, and then choose 8XX FSK.

The 8XX FSK screen opens to the Release tab as shown in Figure 4-70.

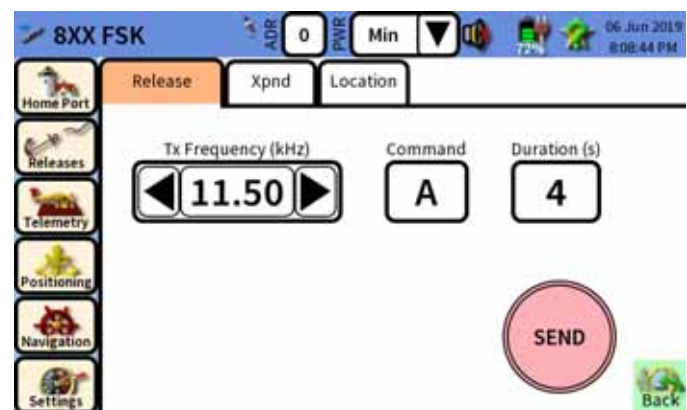


Figure 4-70 8XX FSK Screen—Release Tab

2. Determine the receive frequency of the 8XX FSK Acoustic Release, and then tap or touch and hold the left or right arrow of the Tx Frequency setting to select this frequency in kilohertz.

This frequency is the topside transmit frequency and it must be the same as the transponder receive frequency.

3. Determine the command code for releasing the 8XX FSK Acoustic Release. It will be one of 13 letters, A through M.

4. Touch the Command setting.

The command code keypad opens.

5. Touch the required command code.

The keypad closes and the code is displayed as the Command setting.

6. Touch the Duration setting.

The duration keypad opens.

7. Touch the required duration. The duration is how long the FSK tones will be sent. A duration of 8 is recommended.

The keypad closes and the duration is displayed as the Duration setting.



CAUTION Before proceeding with the next step, verify that the command code is correct.

8. Touch—and hold—SEND.

Three short beeps followed by a long beep will be heard, and then the SEND button will become highlighted.



NOTE The command will be sent only after the SEND button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the Send button. The Send button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

9. Release SEND.

The command is sent, an information window temporarily opens with the message "Transmitting FSK Command Code = <command code>," and then the Xpnd tab opens. With this tab open—and after the command has been transmitted and any acknowledgments received—ranges can be acquired and displayed by touching Ping. In addition, touching Repeat before touching Ping enables continuous ranging on a released 8XX FSK Acoustic Release for tracking purposes. Refer to "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89 for detailed instructions.



NOTE After sending a release command, the release will acknowledge that it has been released by transmitting four pings. Receipt of these pings is indicated by plots of frequency versus range on the graph on the Xpnd tab along with the display of the frequencies, the ranges, the round trip times, and the detect levels in the range history table. The displayed ranges and round trip times should be disregarded, however, and if the frequency has been blocked (UTS-9500M Universal Topside only), no plots or displayed information will be present. Furthermore, as the frequency of each ping is the same and the round trip time increases for each ping, the plots on the graph will line up vertically.

Releasing an EdgeTech Acoustic Release

To release an EdgeTech Acoustic Release:

1. Select Releases from the Menu bar, select Other, and then choose EdgeTech.

The EdgeTech screen opens to the Release tab as shown in Figure 4-71.

2. Determine the release code for the EdgeTech Acoustic Release. It will be a six-digit number.

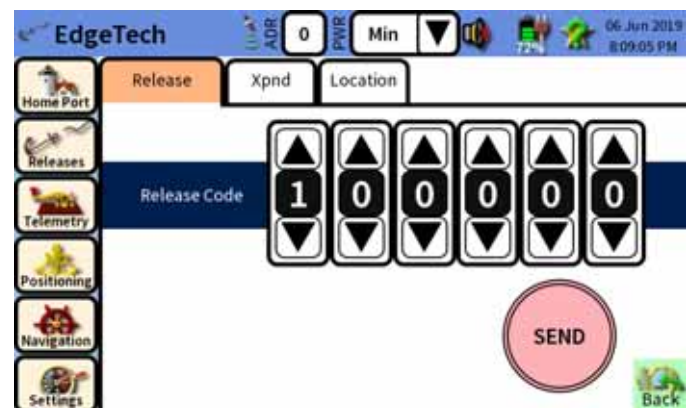


Figure 4-71 EdgeTech Screen—Release Tab

3. Tap or touch and hold the up or down arrow for each digit to enter the release code.



CAUTION Before proceeding with the next step, verify that the release code is correct.

4. Touch—and hold—SEND.

Three short beeps followed by a long beep will be heard, and then the SEND button will become highlighted.



NOTE The command will be sent only after the SEND button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the Send button. The Send button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

5. Release SEND.

The command is sent, an information window temporarily opens with the message "Transmitting EdgeTech Command Code = <command code>," and then the Xpnd tab opens. With this tab open—and after the command has been transmitted and any acknowledgments received—ranges can be acquired and displayed by touching Ping. In addition, touching Repeat before touching Ping enables continuous ranging on a released EdgeTech Acoustic Release for tracking purposes. Refer to "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89 for detailed instructions.



NOTE Refer to the EdgeTech users manual for the specific response confirmation. Receipt of these pings is indicated by plots of frequency versus range on the graph on the Xpnd tab along with the display of the frequencies, the ranges, the round trip times, and the detect levels in the range history table. The displayed ranges and round trip times should be disregarded, however, and if the frequency has been blocked (UTS-9500M Universal Topside only), no plots or displayed information will be present. Furthermore, as the frequency of each ping is the same and the round trip time increases for each ping, the plots on the graph will line up vertically.

Commanding a URI CPIES Unit

To command a URI CPIES unit:

1. Select Releases from the Menu bar, select Other, and then choose URI CPIES.

The URI CPIES screen opens to the Release tab as shown in Figure 4-72.

2. Determine the function code for the URI CPIES unit. It will be a one or two-digit number.
3. Tap or touch and hold the left or right arrow to enter the code.

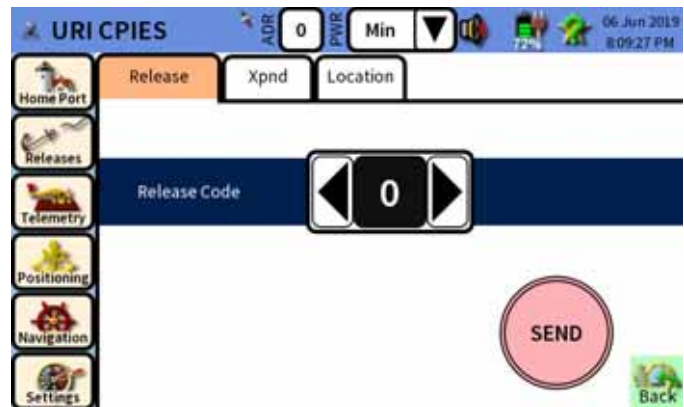


Figure 4-72 URI CPIES Screen—Release Tab



CAUTION Before proceeding with the next step, verify that the release code is correct.

4. Touch—and hold—SEND.

Three short beeps followed by a long beep will be heard, and then the SEND button will become highlighted.



NOTE The command will be sent only after the SEND button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the Send button. The Send button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

5. Release SEND.

The command is sent, an information window temporarily opens with the message "Transmitting URI CPIES Command Code = <command code>," and then the Xpnd tab opens. With this tab open—and after the command has been transmitted and any acknowledgments received—ranges can be acquired and displayed by touching Ping. In addition, touching Repeat before touching Ping enables continuous ranging on a released URI CPIES unit for tracking

purposes. Refer to "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89 for detailed instructions.



NOTE Refer to the URI users manual for the specific response confirmation. Receipt of these pings is indicated by plots of frequency versus range on the graph on the Xpnd tab along with the display of the frequencies, the ranges, the round trip times, and the detect levels in the range history table. The displayed ranges and round trip times should be disregarded, however, and if the frequency has been blocked (UTS-9500M Universal Topside only), no plots or displayed information will be present. Furthermore, as the frequency of each ping is the same and the round trip time increases for each ping, the plots on the graph will line up vertically.

Releasing a GeoPro OBS Acoustic Release

To release a GeoPro OBS Acoustic Release:

1. Select Releases from the Menu bar, select Other, and then choose GeoPro.

The GeoPro screen opens to the Release tab as shown in Figure 4-73.

2. Touch the Command Type selection.

A drop-down list opens as shown in Figure 4-74.

3. Select Release from the drop-down list.
 4. Determine the address for the GeoPro Acoustic Release. It will be a number from 1 to 120.
 5. Touch the Address setting.
- The address keypad opens.

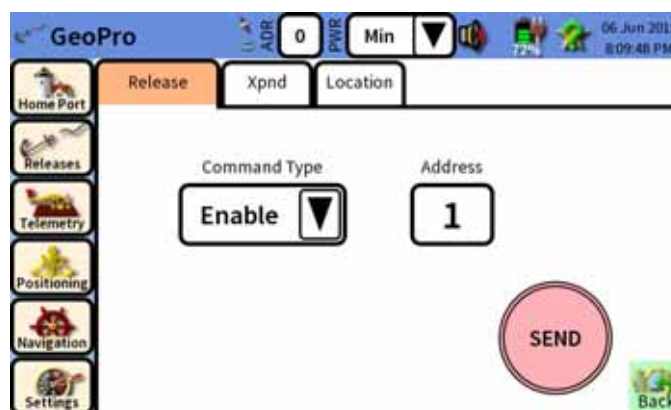


Figure 4-73 GeoPro Screen—Release Tab

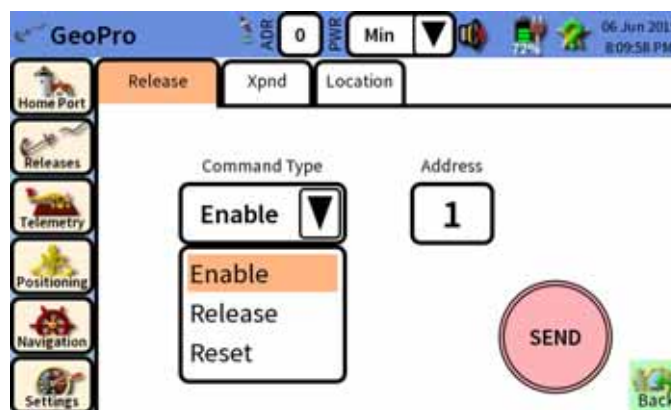


Figure 4-74 Command Type Drop-Down

6. Touch the required address, and then touch OK.

The keypad closes and the address is displayed as the Address setting.



CAUTION Before proceeding with the next step, verify that the address is correct.

7. Touch—and hold—SEND.

Three short beeps followed by a long beep will be heard, and then the SEND button will become highlighted.



NOTE The command will be sent only after the SEND button is released. To abort the command, continue to maintain contact with the touch screen display while sliding the finger completely off the Send button. The Send button will become unhighlighted. If the command successfully aborts, an information window will appear with the message "Transmission aborted."

8. Release SEND.

The command is sent, an information window temporarily opens with the message "Transmitting GeoPro Command Type = Release, Address = <release address>," and then the Xpnd tab opens. With this tab open—and after the command has been transmitted and any acknowledgments received—ranges can be acquired and displayed by touching Ping. In addition, touching Repeat before touching Ping enables continuous ranging on a released GeoPro Acoustic Release for tracking purposes. Refer to "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89 for detailed instructions.



NOTE Refer to the GeoPro users manual for the specific response confirmation. Receipt of any ping is indicated by plots of frequency versus range on the graph of the Transpond Data screen along with the display of the frequency, the ranges and the round trip times. The displayed ranges and round trip times should be disregarded, however, and if the frequency has been blocked (UTS-9500M Universal Topside only), no plots or displayed information will be present. Furthermore, as the frequency of each ping is the same and the round trip time increases for each ping, the plots on the graph will line up vertically.

Ranging to a Remote Device

The topside can be used to acquire and to display ranges to any Teledyne Benthos manufactured acoustic release or modem. The topside can also be used to acquire status from the remote device. Before attempting to acquire ranges to or status from a remote device, always ensure that the transducer is connected.



NOTE Before attempting to acquire ranges to or status from a remote device, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

Acquiring and Displaying the Range to a Remote Device

To acquire and display the range to a remote device:

1. Select Positioning from the Menu bar, select Ranging and then choose the remote device.

The device screen opens to the Range tab as shown in Figure 4-75. The one shown is for a 875-T Series Release.

2. Tap or touch and hold the left or right arrow of the Timeout/Rpt Rate setting to set the timeout in seconds.

The timeout determines how long after transmitting a range command the topside waits to receive the range information. When sending multiple range commands, it is the time between them.

3. Touch the Repeat Type button repeatedly to select None.
4. Touch the Range button.

The range command is sent, and an information window temporarily opens confirming the sent command along with the remote device address. In addition, "RNG" is momentarily displayed on the graph along with the remote device address followed by a countup to the timeout in seconds. When the range is acquired, it is displayed in another temporary information window in

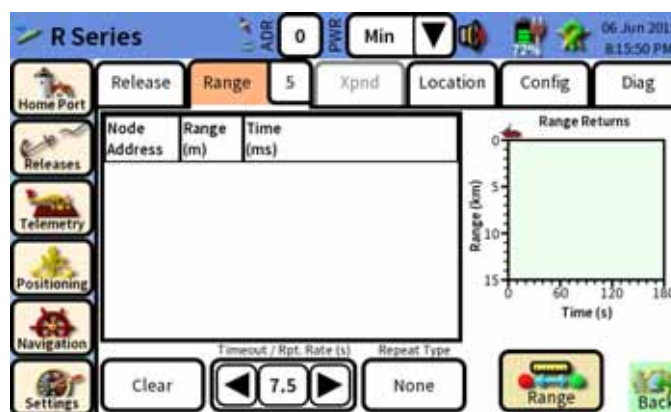


Figure 4-75 Range Tab—875-T Series Release

units of meters or feet as shown in Figure 4-76. Refer to "Selecting the Distance Units" on page 4-19 to select meters or feet for the range display. The same range information is also displayed in the range history table as shown in Figure 4-77, and a plot of the range versus elapsed time in seconds is displayed on the graph. If the range is not acquired, a no response indication is displayed in the window and a "not received" is shown in the range history table.

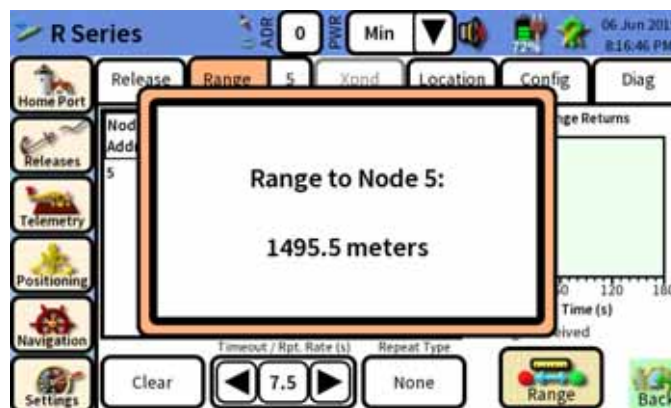


Figure 4-76 Information Window with Displayed Range

5. To acquire another range, touch the Range button again.
6. To clear the history table and the graph, touch the Clear button, and then touch OK in the Confirm Clear window.



NOTE Range can also be acquired from the Comms tab as described in "Acquiring and Displaying Ranges from the Comms Tab" on page 4-83.

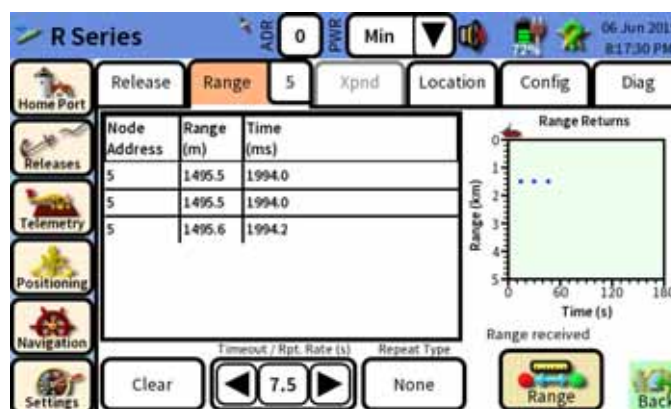


Figure 4-77 Range Tab with Displayed Ranges

Sorting and Clearing the Range History Table

The range history table can be sorted by node address, range or time. The table, along with the graph, can also be cleared. Sorting can also be disabled entirely. To sort by node address in ascending order, repeatedly touch the Node Address column header until a down arrow appears, or for descending order, until an up arrow appears. In the case where no arrow is visible, sorting is disabled, and the table returns to its original unsorted state. Similarly, to sort by range, touch the Range column header, and for time, touch the Time column header. To clear the history table and the graph, touch the Clear button, and then touch OK in the Confirm Clear window.

Acquiring and Displaying Ranges to a Remote Device Continuously

Ranges to a remote device can be acquired continuously by automatically sending the range command at the end of each timeout or immediately after acquiring a range. To acquire and display ranges continuously, acquire and display ranges as described in "Acquiring and Displaying the Range to a Remote Device" on page 4-65. Before touching Range, touch the Repeat Type button repeatedly to select either Fixed to range after each timeout or Auto to range immediately after acquiring each range. To stop continuous ranging, touch the Cancel Repeat button.

Basic Configuration of a Remote Device

The basic configuration of a remote device involves the setting its transmit power level and transmit data rate over the acoustic link. These settings can also be checked over the acoustic link. Before attempting to configure or check the basic settings of a remote device, always ensure that the transducer is connected.



NOTE Before attempting to configure or check the basic settings of a remote device, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

Configuring the Transmit Power Level and Transmit Data Rate of a Remote Device

To configure the transmit power level and transmit data rate of a remote device:

1. In the Remote Settings area of the Config tab, touch the Tx Power setting and select the transmit power level.
2. Touch the Set button for the Tx Power setting.

An information window temporarily opens indicating that the transmit power for the remote device is being set. When complete, the update is confirmed. If the update is not confirmed, a no response indication is displayed in the window.

3. In the Remote Settings area of the Config tab, touch the Tx Data Rate setting and select the transmit data rate.

4. Touch the Set button for the Tx Data Rate setting.

An information window temporarily opens indicating that the transmit data rate for the remote device is being set. When complete, the update is confirmed. If the update is not confirmed, a no response indication is displayed in the window.

Checking the Transmit Power Level and Transmit Data Rate of a Remote Device

To check the transmit power level and transmit data rate of a remote device, touch the Get Remote Settings button in the Remote Settings area of the Config tab. An information window temporarily opens indicating that the remote device settings are being requested. When complete, receipt of the settings is confirmed. When the window closes, the remote device transmit power level and transmit data rate are displayed as the Tx Power and Tx Data Rate settings, respectively. If receipt of the settings is not confirmed, a no response indication is displayed in the window.

Advanced Configuration of a Remote Device

The advanced configuration of a remote device involves the checking and editing of specific configuration settings over the acoustic link. Which settings can be edited, however, depend on the remote device type and which firmware version is installed. Those remote devices with older firmware versions will not support the checking or editing of the advanced configuration settings. Those with later firmware versions (8.10.0 or later) will. Therefore, all remote devices except the R Series and 875-T Series Releases must first be checked to determine if they support the checking and editing of the advanced configuration settings and which settings are included. The topside will only allow these checks and edits for those remote devices after first determining whether they can be made. Before attempting to configure or check the advanced settings of a remote device, always ensure the transducer is connected.



NOTE Before attempting to configure or check the advanced settings of a remote device, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

Checking the Advanced Configuration Settings of a Remote Device

To check the advanced configuration settings of a remote device:

1. Touch the Config tab.

The Config tab opens.

2. For all remote devices except R Series and 875-T Series Releases, touch the Get Remote Settings button.

An information window temporarily opens indicating that the remote device settings are being requested. When complete, receipt of the settings is confirmed and the Adv. tab becomes available. If receipt of the settings is not confirmed, a no response indication is displayed in the window and the Adv. tab remains unavailable.

3. Touch the Adv. tab.

The Config/Adv. tab opens as shown in Figure 4-78. The one shown is for an SM-97X SMART Modem.

4. Touch the configuration parameter to be checked in the Remote Advanced Config drop-down list. If more than one configuration parameter is listed, additional selections can be made. To select all the listed configuration parameters, touch the All button. To clear them all, touch the None button.

All the selected parameters except the last one selected will be highlighted in one color as shown in Figure 4-79. The last one selected is highlighted with a different color signifying that it is the one that can be currently edited as described in "Editing the Advanced Configuration Settings of a Remote Device" on page 4-70.

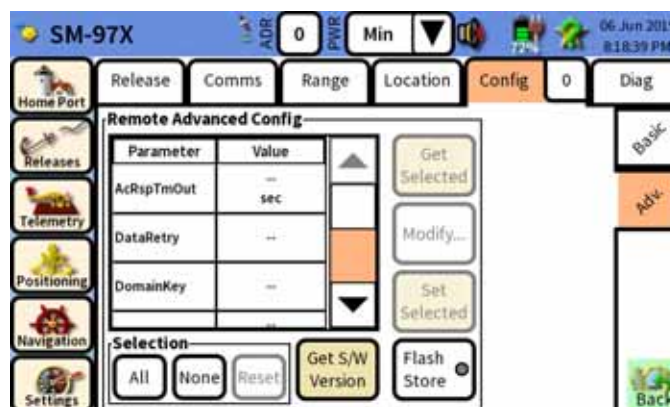


Figure 4-78 Config/Adv. Tab—SM-97X SMART Modem

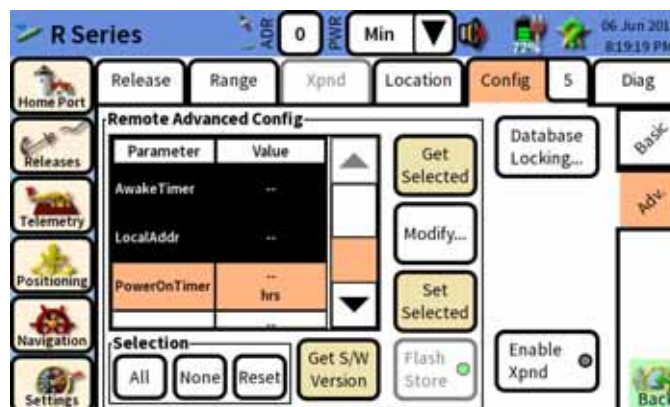


Figure 4-79 Configuration Parameter Settings to be Checked

5. Touch the Get Selected button.

An information window temporarily opens indicating that the topside is getting the advanced configuration parameters, and when they are acquired, the information is displayed in the Remote Advanced Config drop-down list as shown in Figure 4-80. If the advanced configuration parameters are not acquired, a no response indication is displayed in the window. To clear the information in the drop-down, touch Reset.

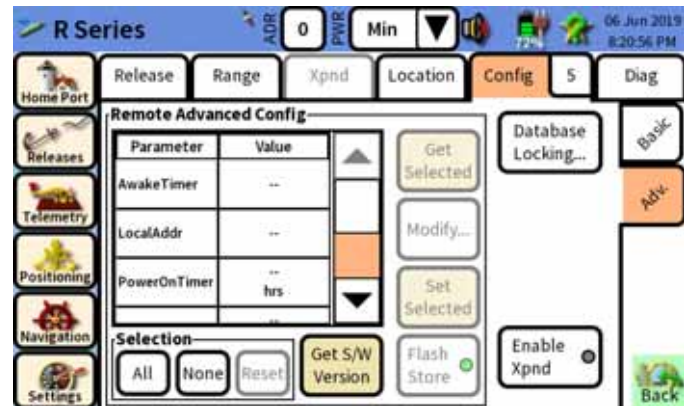


Figure 4-80 Checked Configuration Parameters Displayed

Editing the Advanced Configuration Settings of a Remote Device

To edit the advanced configuration settings of a remote device:

1. Touch the Config tab.
The Config tab opens.
2. For all remote devices except R Series and 875-T Series Releases, touch the Get Remote Settings button.

An information window temporarily opens indicating that the remote device settings are being requested. When complete, receipt of the settings is confirmed and the Adv. tab becomes available. If receipt of the settings is not confirmed, a no response indication is displayed in the window and the Adv. tab remains unavailable.

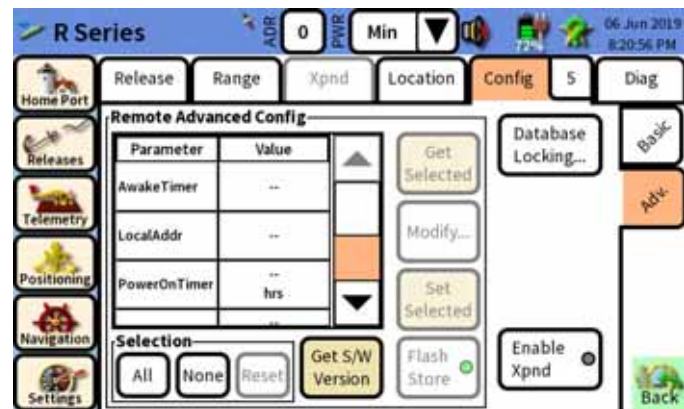


Figure 4-81 Config/Adv. Tab—R Series Release

3. Touch the Adv. tab. The Config/Adv. tab opens as shown in Figure 4-81. The one shown is for an R Series Release.
4. For an R Series Release only, unlock its database as described in "Locking and Unlocking the R Series Release Database" on page 4-72.

5. Touch the configuration parameter to be edited in the Remote Advanced Config drop-down list.

6. Touch the Modify button.

The Modify Parameter Value window opens as shown in Figure 4-82. The one shown is for the PowerOnTimer configuration parameter.

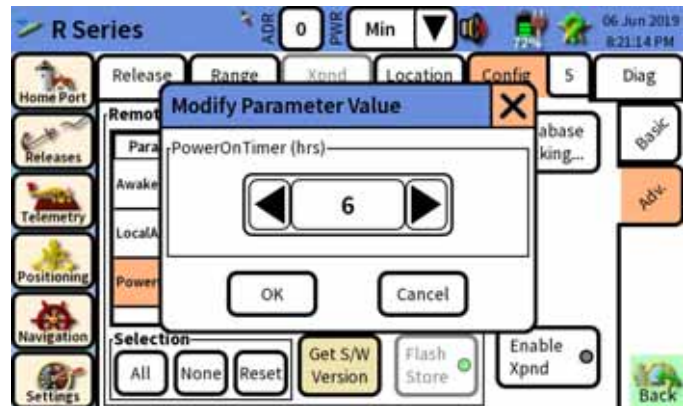


Figure 4-82 Modify Parameter Value Window—PowerOnTimer Configuration Parameter

7. Tap or touch and hold the up or down arrow or the left or right arrow to select the value for the configuration parameter, or select it from a drop-down list, whichever applies. The AwakeTimer configuration parameter has both hours and minute settings. All the others have a single setting.

8. Touch the OK button.

The Modify Parameter Value window closes.

9. Repeat Steps 5 through 8 to edit additional configuration parameters if desired as shown in Figure 4-83.

To permanently store the changed configuration parameters in the flash memory of the remote device, touch the Flash Store button such that the indicator on the button is lit.

If this button is not available, the option is not selectable, and the changed configuration parameters will be stored only if the indicator on the button is lit. For an R Series Release, the changes are always permanent, and the indicator on Flash Store button is always lit. The settings of permanently stored configuration parameters will remain unchanged after resetting the remote device or turning it off and then on again. In both cases, if the changed configuration parameters are not permanently stored, they will instead revert to their former settings.

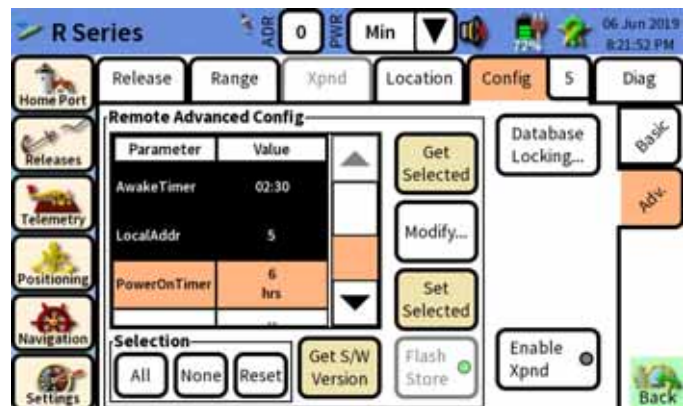


Figure 4-83 Configuration Parameter Settings to be Edited

10. Touch the Set Selected button.

An information window temporarily opens indicating that the topside is setting the advanced configuration parameters. For an R Series Release only, if the database is locked, this condition will be indicated in the window instead. If the advanced configuration parameters are not set, a no response indication is displayed in the window.

11. For an R Series Release only, lock its database as described in "Locking and Unlocking the R Series Release Database" below.

Locking and Unlocking the R Series Release Database

For an R Series Release, its database must be unlocked before any configuration settings can be edited. A locked database helps to prevent malicious tampering with the settings. Once the settings are changed, the database should again be locked. The serial number of the R Series Release is required to unlock the database, but it is not required to lock it.

To unlock an R Series Release database:

1. On the Config/Adv. tab touch the Database Locking button.

The R Series Database Locking window opens as shown in Figure 4-84.

2. Touch the Release Serial # setting.

A keypad opens.

3. Enter the serial number of the R Series Release to unlock, and then touch OK. To backspace and delete a character, touch the Del pad.

The keypad closes and the serial number is displayed as the Release Serial # setting.

4. Touch the Unlock Remote button.

An information window temporarily opens indicating that the topside is unlocking the database. When the database is unlocked, another information window temporarily opens indicating that the database is unlocked. If unlocking is not confirmed, a no response indication is displayed in the window.

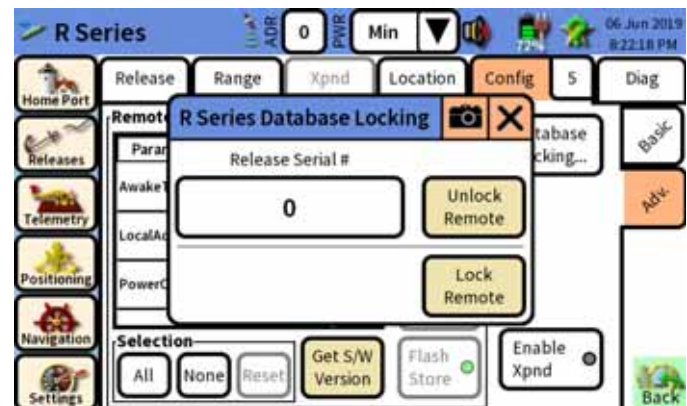


Figure 4-84 R Series Database Locking Window

To lock an R Series Release database:

1. On the Config/Adv. tab touch the Database Locking button.

The R Series Database Locking window opens as shown in Figure 4-84.

2. Touch the Lock Remote button. A serial number is not required.

An information window temporarily opens indicating that the topside is locking the database. When the database is locked, another information window temporarily opens indicating that the database is locked. If locking is not confirmed, a no response indication is displayed in the window.

Checking the Software Version of a Remote Device

The software version of any remote device except an 875-T Series Release can be checked.

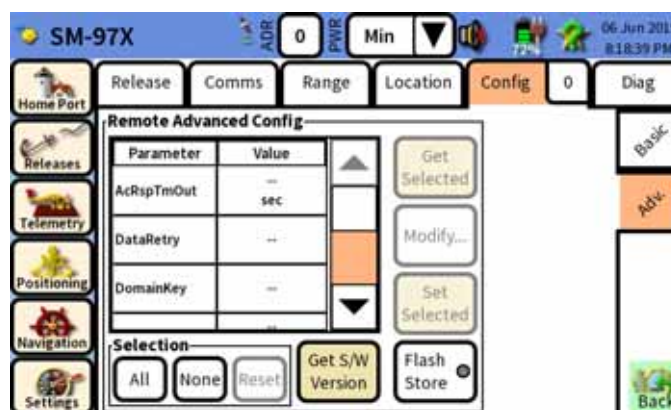
To check the software version of a remote device:

1. Touch the Config tab.

The Config tab opens.

2. For all remote devices except an R Series Release, touch the Get Remote Settings button.

An information window temporarily opens indicating that the remote device settings are being requested. When complete, receipt of the settings is confirmed and the Adv. tab becomes available. If receipt of the settings is not confirmed, a no response indication is displayed in the window and the Adv. tab remains unavailable.



**Figure 4-85 Config/Adv. Tab—SM-97X
SMART Modem**

3. Touch the Adv. tab. The Config/Adv. tab opens as shown in Figure 4-85. The one shown is for a SM-97X SMART Modem.
4. Touch the Get S/W Version button.

An information window temporarily opens indicating that the software version is being requested, and when it is acquired, the information is displayed in the window. If the software version is not acquired, a no response indication is displayed in the window.

Running Diagnostics on a Remote Device

A number of diagnostic checks of a remote device can be run over the acoustic link. They involve checks of the battery; the acoustic channel, link and statistics; and the uptime. The remote device can also be reset.

Checking the Battery of a Remote Device

For all the remote devices, the battery voltage can be checked. Additionally, for an R Series Release, battery metering and battery information can also be checked. Battery metering provides information on how much energy has been consumed and how much capacity is remaining and takes into account battery temperature and age. Battery information includes the date of manufacture and battery capacity.

To check the battery of a remote device:

1. Touch the Diag tab, and then touch the Battery tab.

The Diag/Battery tab opens as shown in Figure 4-86. The one shown is for an R-Series Release.

2. In the Remote area of the Diag/Battery tab, touch the Get Batt Voltage button to check the battery voltage.
3. If available, touch the Get Batt Metering button to check the battery metering.
4. If available, touch the Get Batt Info button to check battery information.

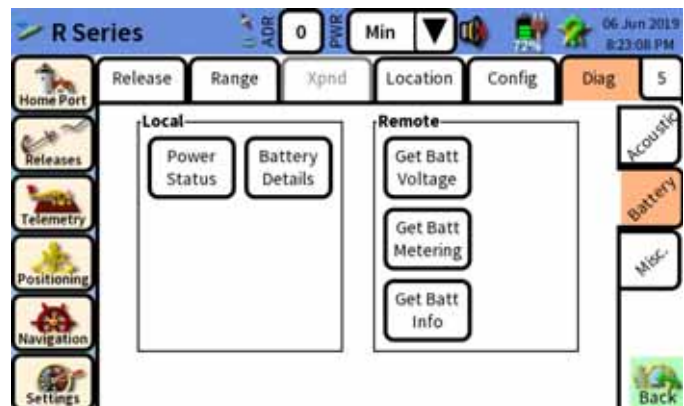


Figure 4-86 Diag/Battery Tab—R Series Release

In each of the above three cases, an information window temporarily opens indicating that the topside is acquiring the battery information, and when it is acquired, the information is displayed in the window. If the battery information is not acquired, a no response indication is displayed in the window.

Checking the Acoustic Channel to a Remote Device

The acoustic channel to a remote device can be checked for multipath effects on transmissions received from the remote device. The check involves commanding the remote device to transmit a test signal, probing for the signal and generating an impulse response plot as well as relevant statistics on the received signal, if any.

To check the acoustic channel to a remote device:

1. Touch the Diag tab, and then touch the Acoustic tab.

The Diag/Acoustic tab opens as shown in Figure 4-87. The one shown is for an SM-97X SMART Modem.

2. In the Remote area of the Diag/Acoustic tab, touch the Channel Probe button.

The Channel Probe window opens.

3. Touch the Remote Probe button.

An information window temporarily opens indicating that the acoustic channel is being probed. When the channel information is received, the window closes, and the channel information is displayed in the Channel Probe window as shown in Figure 4-88. If the channel information is not acquired, a no response indication is displayed in the information window.

4. Touch the X mark to close the Channel Probe window.

The Impulse Response plot provides an indication of the magnitude of the received signal, if any, with the peak value being normalized to 0 dB. An initial peak that is much stronger than subsequent peaks in the plot indicates that there is a good acoustic channel between the topside and the remote device. Peaks subsequent to the initial peak that are nearly as strong indicate the presence of multipath and possibly a poor acoustic channel. No peaks being received indicates reliable communications with the remote device may not be possible. The peak value relative to the level of ambient noise is displayed in the statistics box along with other data. This value should be made significantly higher than that of the ambient noise level, typically by increasing the transmit power level of the remote device.

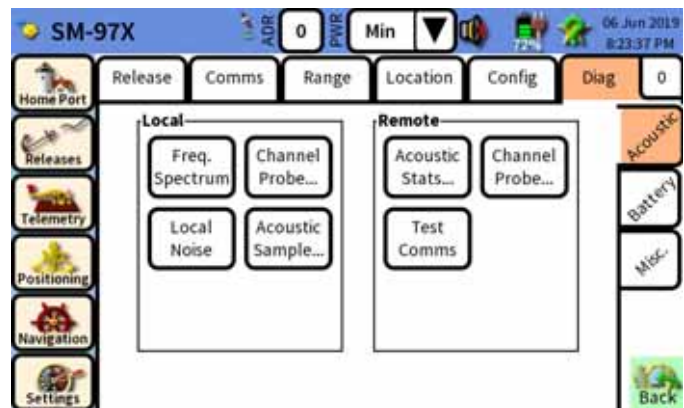


Figure 4-87 Diag/Acoustic Tab—SM-97X SMART Modem

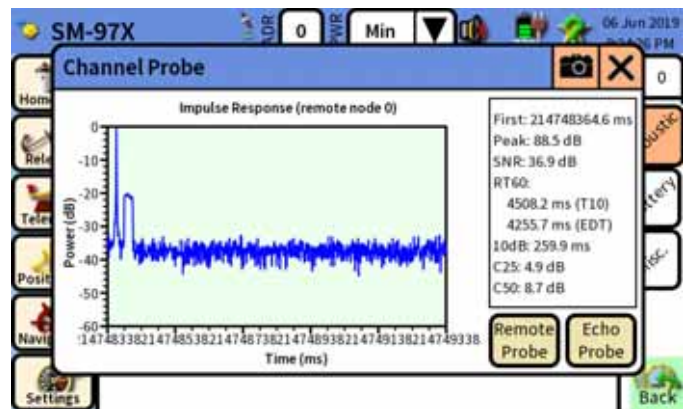


Figure 4-88 Channel Probe Window with Channel Information Displayed

Checking the Acoustic Link with a Remote Device

The acoustic link with a remote device can be checked by commanding the remote device to transmit a preset test message at each of several bit rates. The topside measures and displays the received data statistics which can be used to evaluate the acoustic link.

To check the acoustic link with a remote device:

1. Touch the Diag tab, and then touch the Acoustic tab.

The Diag/Acoustic tab opens.

2. In the Remote area of the Diag/Acoustic tab, touch the Test Comms button.

An information window temporarily opens indicating that the acoustic link with the remote device is being tested. When complete, the window closes, and the received data statistics are shown in the Communications Link Stats window as shown in Figure 4-89. If the test message is not received, a no response indication is displayed in the information window.

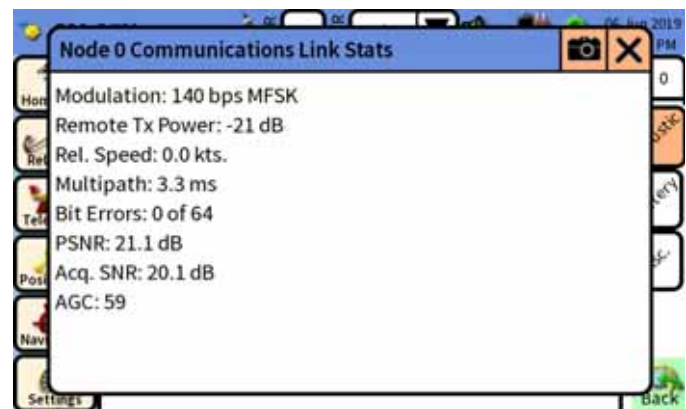


Figure 4-89 Communications Link Stats Window with Received Data Statistics Displayed

3. Touch the X mark to close the Communications Link Stats window.

The PSNR value shown in the Communications Link Stats screen is a measure of the SNR or signal quality. It is affected by both signal strength and multipath and can be used to determine what the transmit power level and transmit data rate should be set to as shown in Table 4-4.

Checking the Acoustic Statistics

The acoustic statistics at the locations of both a remote device and the remote transducer of the topside can be checked. The acoustic statistics include background noise levels, transmit signal strengths, signal to noise levels, and the relative speed between the remote device and the topside. The displays include both graphical and numerical formats.

Table 4-4 PSNR Value and Required Action

PSNR VALUE	ACTION REQUIRED
20+	Signal quality is high. Can use a lower power level or higher transmit data rate.
19–15	Signal quality is good.
14–12	Signal quality is acceptable. If multipath is a factor, a lower power level may improve the signal quality, otherwise go to a higher power level.
11–10	Signal quality is low. If multipath is a factor, a lower power level may improve the signal quality, otherwise go to a higher power level. Also try lowering the transmit data rate.
10>	Signal quality is poor. If multipath is a factor, a lower power level may improve the signal quality, otherwise go to a higher power level, also try lowering the transmit data rate.

To check the acoustic statistics:

1. Touch the Diag tab, and then touch the Acoustic tab.

The Diag/Acoustic tab opens.



NOTE It is important that during the 10 seconds prior to checking the acoustic statistics there be no messages received over the acoustic link, otherwise data will be included in the background noise statistics.

2. In the Remote area of the Diag/Acoustic tab, touch the Acoustic Stats button.

The Acoustic Noise and Signal Levels window opens.

3. Touch the Get Acou Stats button.

An information window temporarily opens indicating that the acoustic statistics are being determined. When complete, the window closes,

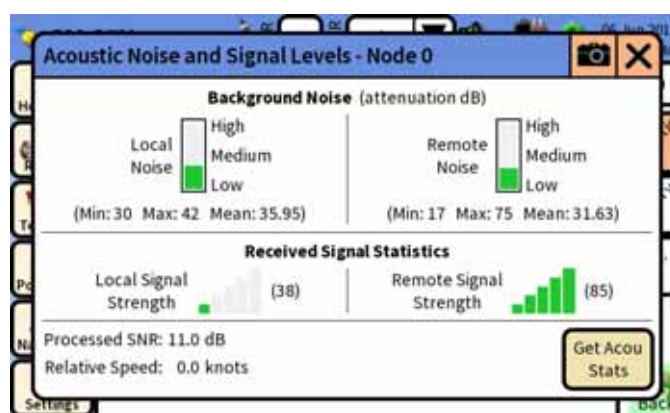


Figure 4-90 Acoustic Noise and Signal Levels Window with Acoustic Statistics Displayed

and the acoustic statistics are displayed in the Acoustic Noise and Signal Levels window as shown in Figure 4-90. If the statistics are not received, a no response indication is displayed in the information window.

4. Touch the X mark to close the Acoustic Noise and Signal Levels window.

The top half of the Acoustic Noise and Signal Levels window displays the background noise levels at the transducer of the UTS-9500 as Local Noise and that of the remote device as Remote Noise. If no response is received over the acoustic link, only the statistics for the topside are displayed. Both displays are pillbox indications representing the average noise level over the previous 10 seconds. The values under the displays are the minimum (Min), the maximum (Max) and the mean (Mean) AGC attenuations from 1 to 100 dB in 1-dB increments. The Mean value corresponds to the pillbox indication and is an average of the high and low values sampled once per second over the past 10 seconds. The higher the signal attenuation, the higher the noise level. If the noise level is high, then the source of the noise should be determined and how it might affect communications. Noise can come from boating traffic, snapping shrimp, cresting waves, rain, and clanking mooring chains. Measures should be taken to reduce the noise.

The bottom half of the Acoustic Noise and Signal Levels window displays the received signal strengths of the topside as Local Signal Strength and that of the remote device as Remote Signal Strength. Both are displayed in dB, where the higher the attenuation the stronger is the signal. Shown in Table 4-5 are the relative received signal strengths for several attenuation levels. The Acoustic Noise and Signal Levels window also displays the signal to noise level (SNR) in dB at the topside transducer and the relative speed in knots between the remote device and the topside.

Table 4-5 Attenuation Versus Received Signal Strength

ATTENUATION (dB)	RECEIVED SIGNAL STRENGTH
>81	Very strong
72–81	Strong
66–71	Average
57–65	Low
48–56	Weak
<48	Very weak

Checking the Uptime of a Remote Device

The uptime of a remote device is the time elapsed since it was last turned on or when it was last reset as described in "Resetting a Remote Device" below. Not all remote devices will provide this information without first updating its firmware.

To check the uptime of a remote device:

1. Touch the Diag tab, and then touch the Misc tab.

The Diag/Misc tab opens as shown in Figure 4-91. The one shown is for an SM-97X SMART Modem.

2. In the Remote area of the Diag/Misc tab, touch the Get Uptime button.

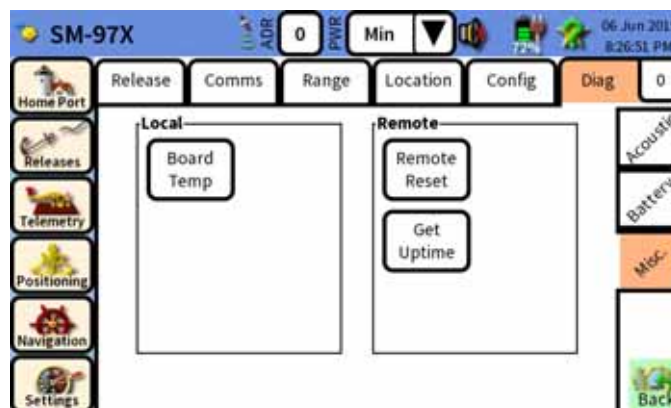


Figure 4-91 Diag/Misc Tab—SM-97X SMART Modem

An information window temporarily opens indicating that the uptime is being acquired, and when it is acquired, the information is displayed in the window. If the uptime is not acquired, a no response indication is displayed in the window.

Resetting a Remote Device

A remote device can be reset which effectively is the same as turning it off and then on again.

To reset a remote device:

1. Touch the Diag tab, and then touch the Misc tab.

The Diag/Misc tab opens as shown in Figure 4-91. The one shown is for an SM-97X SMART Modem.

2. Touch Remote Reset

The Confirm Remote Reset window opens.

3. Touch OK.

An information window temporarily opens indicating that the reset command is being sent. No confirmation is expected, but it is possible to hear the remote device startup tones from the topside speaker when the reset occurs.

Communicating with a Remote Device

The topside can be used to send data to an instrument that is connected to a remote device and to receive data from the remote device. The data to be sent are entered and displayed in the touch screen display using an on screen keyboard. Before attempting to communicate with a remote device, always ensure that the transducer is connected.



NOTE Before attempting to communicate with a remote device, configure the topside as described in "Configuring the Topside for Communications" on page 4-40.

Sending Data to an Instrument that is Connected to a Remote Device

Data can be sent from the topside to an instrument, such as an Acoustic Doppler Current Profiler (ADCP), that is connected to a remote device. The data are transmitted to the device over the acoustic link, and the device in turn sends the data to the instrument. Responses from the instrument can be sent to the device which in turn will transmit the data over the acoustic link to the topside for display.

To send data to an instrument that is connected to a remote device:

1. Select Telemetry or Releases from the Menu bar, depending on whether the remote device is a modem or a release, and then choose the remote device.

For a modem the device screen opens to the Comms tab; for a release the device screen opens to the Release tab.

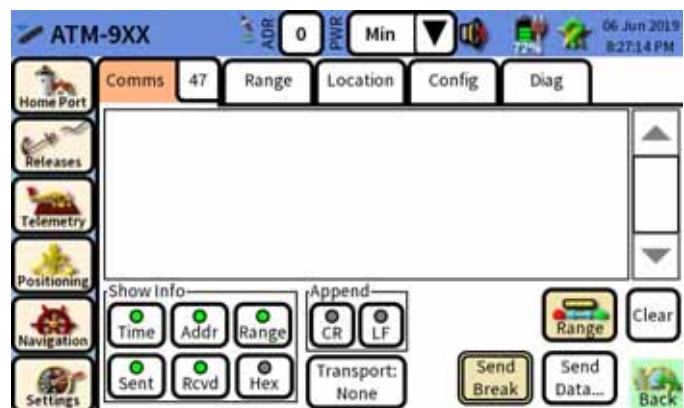


Figure 4-92 Comms Tab—ATM-9XX Series Acoustic Telemetry Modem

2. If a release was selected, touch the Comms tab.

The Comms tab opens as shown in Figure 4-92. The one shown is for an ATM-9XX Series Acoustic Telemetry Modem.

3. To display various types of information transmitted with the data, touch one or more of the buttons listed below such that the indicator on the button is lit.

Touch the Time button to show the time and date.

Touch the Addr button to show the address of the remote device.

Touch the Range button to show the range to the remote device.

Touch the Sent button to show messages sent.

Touch the Rcvd button to show messages received.

Touch the Hex button to show the hexadecimal rendition of the transmitted and received data along with the normal ASCII.



NOTE The information listed above can be displayed or hidden at any time after transmitting.

4. To append a carriage return with the data sent, touch the CR button such that the indicator on the button is lit; to append a line feed, touch LF button such that the indicator on the button is lit.
5. For remote devices that include dual serial ports, touch the Transport button repeatedly to select one of the two ports as listed below through which to route the data. If the remote device does not support dual serial ports, select None.

None or Port 1 to route data through COM1.

Port 2 to route data through COM2.

6. Touch Send Data.

The data entry keyboard opens as shown in Figure 4-93.

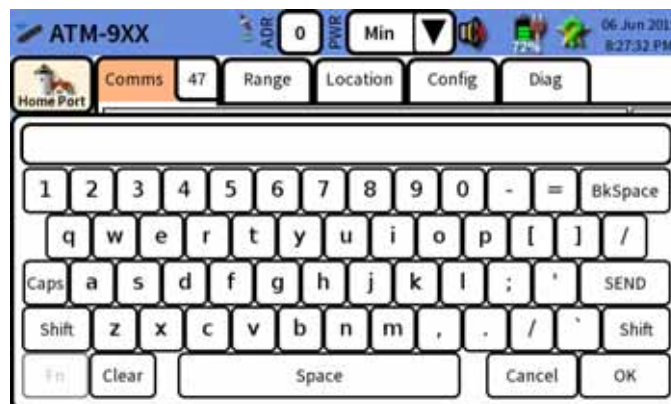


Figure 4-93 Data Entry Keyboard

7. Enter the data to be sent, a maximum of 50 characters, by touching the appropriate keys. The data are displayed above the keyboard as shown in Figure 4-94. To switch back and forth from lower case to upper case letters, touch Shift. To clear any entered data, touch Clear. To cancel sending the message and close the keyboard, touch Cancel.

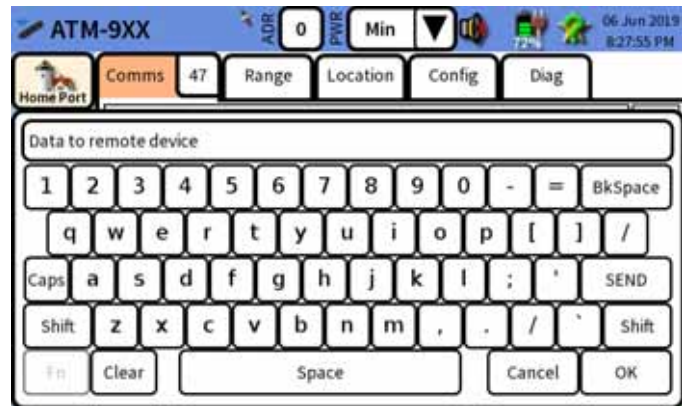


Figure 4-94 Data to be Sent

8. Touch OK to send the data and close the keyboard, or touch SEND to the send the data and keep the keyboard open.

The data are sent. If selected, carriage return and line feed characters are sent with the data but are not displayed. If selected, the date and time, the remote device address, the range to the remote device, and the sent data are

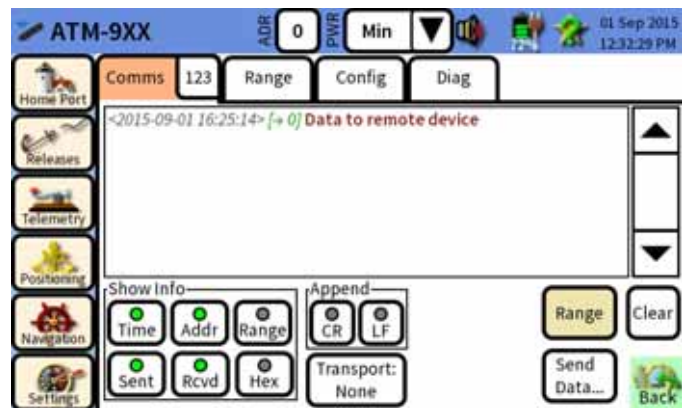


Figure 4-95 Sent Data

displayed on the Comms tab as shown in Figure 4-95. If selected, the hexadecimal rendition of the data are displayed also. Up and down arrows to the right of the scroll box to enable scrolling through the lines.

9. Enter and send additional data as required.
10. To clear the display, touch the Clear button.
The Confirm screen opens.
11. Touch OK to clear the display.
The Confirm screen closes, and the display is cleared.

Displaying Data Sent to and Received from Remote Devices

Data can be received from any remote device, and when received, the data are displayed on the Comms tab for that device. Along with the received data, the time and date stamps, remote device address, ranges, and sent messages can be displayed. To display this additional information, the indicators on the corresponding buttons on the Comms tab must be lit as shown in Figure 4-92 on page 4-80. Data can be received regardless which screen or tab is open at the time of receipt. When a message is received, an audio indication is output, and the Modem Address control on the Status and Control bar flashes. Refer to "Status and Control Bar" on page 4-7 for a description of the Status and Control bar.

Saving Data Sent to and Received from Remote Devices to a Log File

The data displayed on the Comms tab can be saved to a log file as ASCII text. The data can also be viewed at any time when saved, cleared or transferred to a USB flash drive. For instructions on how to save the data to a log file, and how to view, clear and transfer the log file, refer to "System Logging" on page 4-30.

Acquiring and Displaying Ranges from the Comms Tab

To acquire and display ranges from the Comms tab, touch the Range button. An information window temporarily opens confirming the sent command along with the remote device address. When the range is acquired, it is displayed on the Comms tab in units of meters or feet, along with the round trip time in milliseconds as shown in Figure 4-96. Refer to "Selecting the Distance Units" on page 4-19 to select meters or feet for the range display. If the range is not acquired, a no response indication is displayed in the information window and a "not received" is shown on the Comms tab.

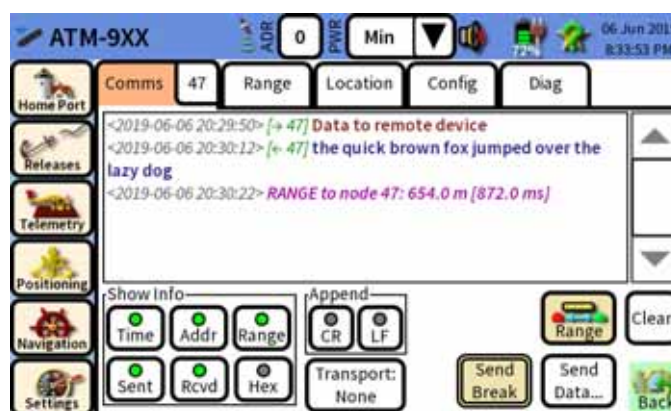


Figure 4-96 Displayed Ranges on the Comms Tab

Transponder Functions

The wide low frequency 7–16 kHz (WLF) UTS-9500 Universal Topside can be used to acquire and display ranges to any Teledyne Benthos manufactured acoustic transponder, and to those manufactured by EdgeTech, URI and GeoPro, or to any transponder that replies to pings in the operating frequency band of the topside. In addition, the R Series Release includes a transponder emulation feature which enables it to be configured to operate as a tonal transponder, responding to a specific interrogation tone by transmitting a specific reply tone. For instructions on how to enable and disable transponder emulation for an R Series Release, refer to "Operating an R Series as a Transponder" on page 4-91. For instructions on how to configure the transponder transmit and receive frequencies for an R Series Release or an 8XX FSK Acoustic Release, refer to "Advanced Configuration of a Remote Device" on page 4-68. Before attempting to acquire ranges, always ensure that the transducer is connected.

Configuring the Basic Topside Transponder Settings

Before acquiring ranges to transponders, a number of basic topside transponder settings need to be made. These settings include the topside transmit and receive frequencies, transmit and receive pulse widths, turn-around-time (TAT), lockout time, and receive threshold.

To configure the basic topside transponder settings:

1. Select Positioning from the Menu bar, select Tonal Xpnd, and then choose the remote device.

The device screen opens to the Xpnd tab.

2. Touch the Settings tab.

The Xpnd/Settings tab opens as shown in Figure 4-97. The one shown is for a Universal.

3. Tap or touch and hold the left or right arrow of the Ping Frequency Rx setting to set the topside receive frequency in kilohertz.

For a UTS-9500M Universal Topside, the receive frequency setting is *only* required to

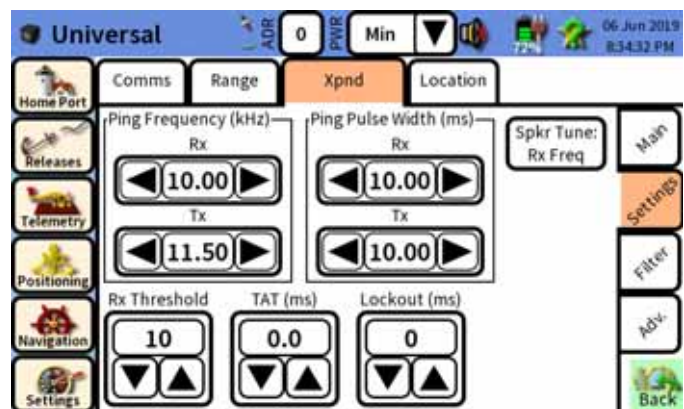


Figure 4-97 Xpnd/Settings Tab—Universal

ensure the clearest audible output from the topside speaker. The setting is otherwise not relevant since the UTS-9500M Universal Topside is a multi-receive topside. For a UTS-9500E or UTS-9500A, the receive frequency setting *must* be set to the transmitted reply frequency of the transponder.



NOTE For a UTS-9500M Universal Topside only, touch Spkr Tune such as to display Rx Freq to tune the speaker to output only the selected receive frequency, or touch Spkr Tune such as to display Full Band to tune the speaker to output all in-band frequencies. With Full Band selected, the Ping Frequency Rx setting cannot be changed. Either selection does not affect the receive characteristics of the topside, only that of the speaker.

4. Tap or touch and hold the left or right arrow of the Ping Frequency Tx setting to set the topside transmit frequency in kilohertz.

The topside transmit frequency must be the same as the receive frequency of the transponders.

5. Tap or touch and hold the left or right arrow of the Ping Pulse Width Rx setting to set the topside receive pulse width in milliseconds.

The receive pulse width setting should be approximately the same as the expected transmitted reply pulse width of the transponders.

6. Tap or touch and hold the left or right arrow of the Ping Pulse Width Tx setting to set the topside transmit pulse width in milliseconds.

The transmit pulse width setting should be approximately the same as the receive pulse width of the transponders.

7. Tap or touch and hold the up or down arrow of the TAT setting to set the turn-around-time in milliseconds of the transponders. This setting defaults to 8.0 ms for an 8XX FSK Acoustic Release and 30.0 ms for an R Series Release, which is typical for these remote devices.

The turn-around-time is the time from when a transponder receives a ping to when it transmits the reply.

8. Tap or touch and hold the up or down arrow of the Lockout setting to set the lockout time in milliseconds of the topside.

The lockout time is the elapsed time between the start of the transmitted ping from the topside to when the topside will enable the detection of received signals. Effectively, this setting inhibits the detection of echoes from the transmitted ping off nearby objects.

9. Tap or touch and hold the up or down arrow of the Rx Threshold setting to set the receive threshold of the topside.

The receive threshold sets the number of standard deviations that a detected signal must rise above the background noise level before it is marked as a received transponder reply. This setting applies to *all* the frequencies in the operating frequency band of the topside. The lower this setting the more sensitive is the receiver and the more likely a detected signal will be marked as a received reply. However, with a low setting there is also a greater likelihood of "false positives," where a detected signal is incorrectly marked as a reply. The higher the setting the less sensitive is the receiver and the less likely a detected signal will be marked as a received reply. Therefore a high setting increases the likelihood of "false negatives," where a detected signal is not marked as a reply and should have been. The receive threshold should be adjusted in accordance with the background noise such as to minimize false positives and negatives.

Configuring the Advanced Transponder Settings

The advanced transponder settings enable adjustment of the receive threshold of any one or more selected frequency channels by adjusting the receive sensitivity of each channel individually.

To configure the advanced transponder settings:

1. On the Xpnd tab touch the Adv. tab.

The Xpnd/Adv. tab opens as shown in Figure 4-98. The one shown is for an 8XX FSK Acoustic Release.
2. Tap or touch and hold the left or right arrow of the Frequency setting to select the receive frequency in kHz for which to adjust the receive sensitivity.

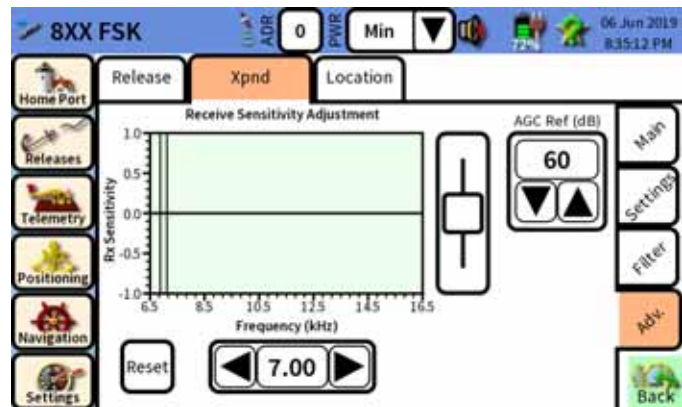


Figure 4-98 Xpnd/Adv. Tab—8XX FSK Acoustic Release

3. Touch and drag the slider up or down to adjust the receive sensitivity, or touch anywhere in the slide to move the slider to that location

The receive sensitivity setting alters the receive threshold for the selected frequency from that which is set for all the frequencies with the Rx Threshold

setting on the Xpnd/Settings tab. The receive threshold for any frequency in the operating frequency band of the topside, in 250-Hz increments, can be adjusted in this manner. The adjustment range is from -1.00 to +1.00, where a negative value *decreases* the receive sensitivity by *increasing* the receive threshold for that frequency, and a positive value *increases* the receive sensitivity by *decreasing* the receive threshold for that frequency. A value of -1.00 effectively sets an infinite threshold, filtering the frequency out, and a value of +1.00 provides the highest sensitivity and is the equivalent of a setting of 10 for the Rx Threshold on the Xpnd/Settings tab. A receive sensitivity setting of 0.00 leaves the receive threshold for that frequency to that of the Rx Threshold setting on the Xpnd/Adv. tab. Therefore every value between -1.00 and +1.00 sets the receive threshold for that frequency along a curve from the lowest sensitivity to the highest sensitivity. The selected frequencies and their receive sensitivity settings are graphically displayed as shown in Figure 4-99.



NOTE To return the receive sensitivity adjustments to zero, touch Reset.

4. Continue selecting frequencies and their receive sensitivities, as many as desired.
5. If desired, touch the up or down arrow of the AGC Ref setting to adjust the automatic gain control reference.

Lowering the AGC reference setting may help avoid false detections in a noisy environment. Increasing the setting will help detect faint returns in a quiet environment. However, the AGC Ref setting should typically be left as is which is 60.

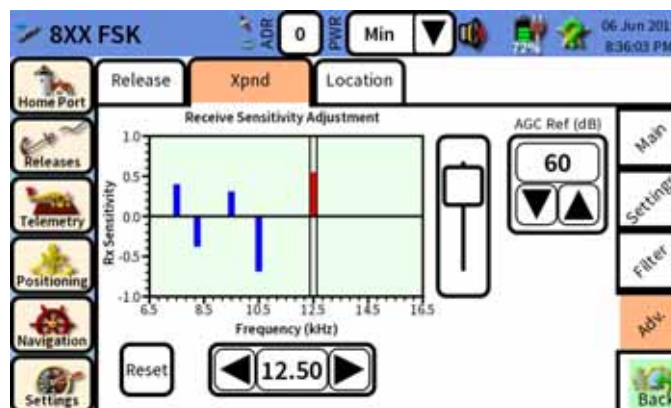


Figure 4-99 Xpnd/Adv. Tab with Receive Sensitivity Settings Graphically Displayed

Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside

Within a single timeout, the UTS-9500M Universal Topside can acquire, display and output on the COM1 serial port the ranges to any number of transponders that have reply frequencies in the operating frequency band of the topside, in 250-Hz increments. However, filtering can be applied to block the display of ranges for replies of specific frequencies. In addition, the display of ranges for all but the first of the replies of the same frequency can be blocked. Ranges that are blocked are not displayed.

To acquire and display ranges with a UTS-9500M Universal Topside:

1. Select Positioning from the Menu bar, select Tonal Xpnd, and then choose the remote device.

The device screen opens to the Xpnd tab.

2. On the Xpnd tab touch the Filter tab.

The Xpnd/Filter tab opens as shown in Figure 4-100. The one shown is for an 8XX FSK Acoustic Release.

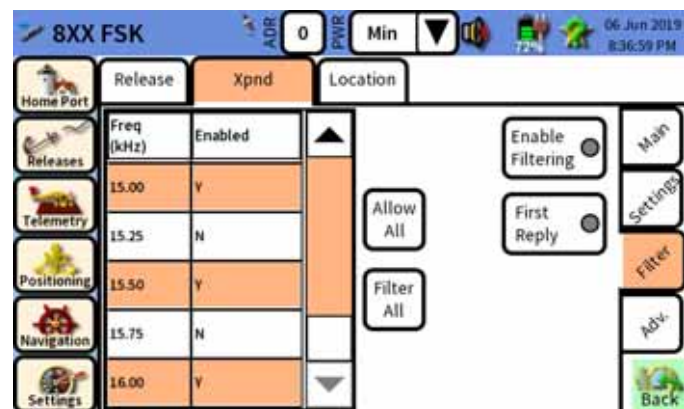


Figure 4-100 Xpnd/Filter Tab—8XX FSK Acoustic Release

3. Select the reply frequencies to block by touching the row in the table corresponding to the frequency in the Freq column. Blocked frequencies will be received but will not be displayed or output on COM1.

If the frequency is hidden, tap the up or down arrow or drag the slider up or down to show it. To unblock a blocked frequency, select it again.

Rows with blocked frequencies are unshaded as shown in Figure 4-100 on page 4-88. They are also shown with an "N" in the Enabled column. Unblocked frequencies are highlighted and shown with a "Y" Enabled column.

To block all frequencies touch the Filter All button; to enable all frequencies, touch the Allow All button.

4. To enable filtering touch the Enable Filtering button such that the indicator on the button is lit.
5. To display only the first reply of the unblocked frequencies during a timeout, touch the First Reply button such that the indicator on the button is lit.

6. Touch the Main tab and then touch the Ping button.

The topside transmits a ping, and the timeout begins with a count up in seconds displayed on the graph. When the replies are received, the reply frequencies in kilohertz, the ranges in meters or feet and the round trip times in milliseconds are displayed as shown in Figure 4-101 as it appears when multiple ranges have been acquired. Plots of the displayed frequencies versus range in kilometers or miles also appear on the graph. Tapping inside the graph changes the range scale. Four full scale ranges are available: 1, 5, 10, and 15 kilometers, or miles if using Imperial units. Should the display fill, a scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the ranges.

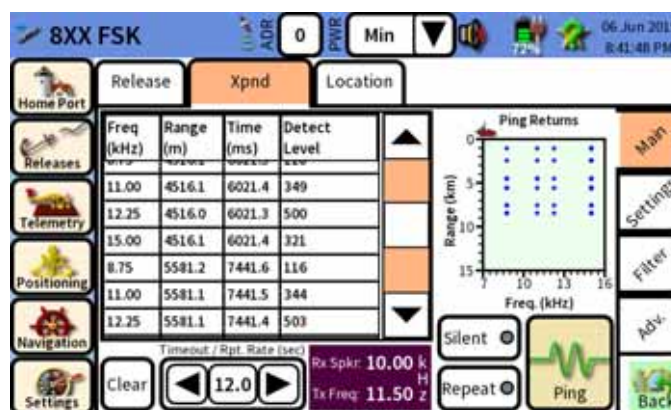


Figure 4-101 Xpnd Tab with Displayed Ranges—UTS-9500M

Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside

Within a single timeout, the UTS-9500E or UTS-9500A Universal Topside can acquire and display the range to transponders with one specific reply frequency only that is in the operating frequency band of the topside, in 250-Hz increments. The reply frequency is selected as described in "Configuring the Basic Topside Transponder Settings" on page 4-84.

To acquire and display ranges with a UTS-9500E or UTS-9500A Universal Topside:

1. Select Positioning from the Menu bar, select Tonal Xpnd, and then choose the remote device.

The device screen opens to the Xpnd tab.

2. Touch the Ping button.

The topside transmits a ping, and the timeout begins with a count up in seconds displayed on the graph. When the reply is received, the reply frequency in kilohertz, the range in meters or feet and the round trip time in milliseconds are displayed as shown in Figure 4-102 as it appears when multiple ranges have

been acquired. A plot of the displayed frequency versus range in kilometers or miles also appears on the graph. Tapping inside the graph changes the range scale. Four full scale ranges are available: 1, 5, 10, and 15 kilometers, or miles if using Imperial units.

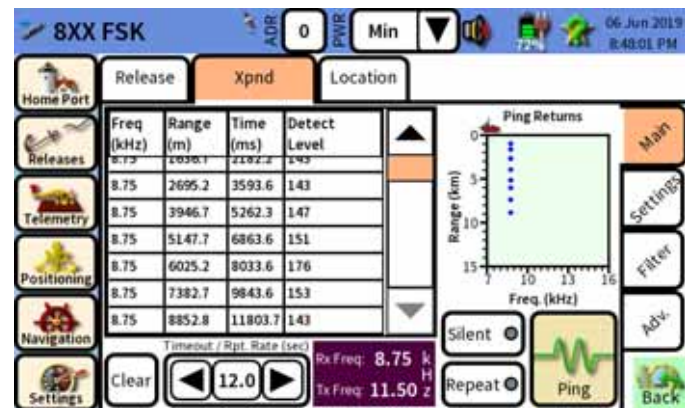


Figure 4-102 Xpnd Tab with Displayed Ranges—UTS-9500E or UTS-9500A

Acquiring and Displaying Ranges Continuously

Ranges can be acquired continuously by sending a ping at the end of each timeout. To acquire and display ranges continuously, acquire and display ranges as described in "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89, and touch the Repeat button such that the indicator on the button is lit before the end of the timeout. To stop pinging, touch the Repeat button again. Should the display fill, a scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the ranges.

Using Silent Ping

Replies from transponders that are being interrogated by devices other than the topside can be received without transmitting a ping from the transducer connected to the topside. The topside will continue to receive the replies from all unblocked frequencies. However, range and time information will be incorrect. To acquire and display ranges using silent ping, acquire and display ranges as described in "Acquiring and Displaying Ranges to Transponders with a UTS-9500M Universal Topside" on page 4-88 or "Acquiring and Displaying Ranges to Transponders with a UTS-9500E or UTS-9500A Universal Topside" on page 4-89, and touch the Silent button such that the indicator on the button is lit before touching the Ping button. Touching the Repeat button such that the indicator on the button is lit will cause the topside to continuously listen for replies, updating every timeout. To turn off silent ping, touch the Silent button again.

Operating an R Series as a Transponder

The R Series Release includes a transponder emulation feature which enables it to be configured to operate as a tonal transponder, responding to a specific interrogation tone by transmitting a specific reply tone. The interrogation tone is the receive frequency of the R Series Release, and the reply tone is the transmit frequency. Both frequencies can be set over the acoustic link, as can enabling and disabling transponder emulation. In addition, the following preset parameters apply:

Receive pulse width: 10 ms

Transmit pulse width: 10 ms

Turn-around-time (TAT): 30 ms

For instructions on how to set the topside transmit and receive frequencies, transmit and receive pulse widths, turn-around-time, lockout time, and receive threshold, refer to "Configuring the Basic Topside Transponder Settings" on page 4-84.



NOTE For instructions on how to configure the transponder transmit and receive frequencies for an R Series Release, refer to "Advanced Configuration of a Remote Device" on page 4-68.

To enable transponder emulation:

1. Refer to "Selecting the Address of a Remote Device" on page 4-44 and select the address and acoustic timeout for the R Series Release.
2. On the Config tab, touch the Adv. tab.

The Config/Adv. tab opens as shown in Figure 4-103.

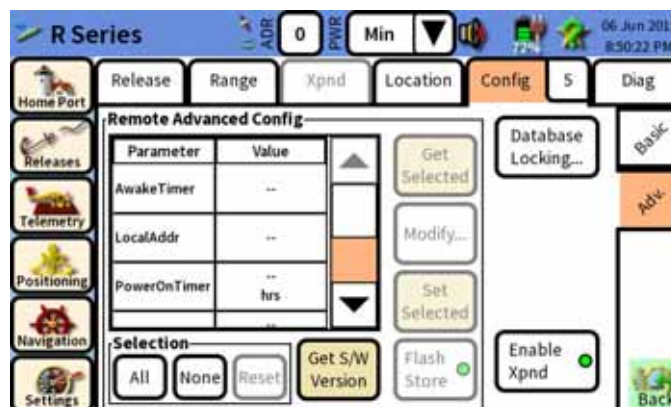


Figure 4-103 R Series Screen—Config/Adv. Tab

3. Touch the Enable Xpnd button such that the indicator on the button is lit.

A WARNING window opens with a reminder that should transponder emulation later be *disabled*, to first receive a confirmation that it has been disabled before attempting to communicate with the R Series Release.

4. Touch OK.

The WARNING window closes.

5. Touch the Release tab.

The Release tab opens with the Xpnd Disable and Xpnd Enable buttons visible as shown in Figure 4-104.

6. Touch—and hold—the Xpnd Enable button.

Three short beeps followed by a long beep will be heard over about two seconds, and then the button will become highlighted.

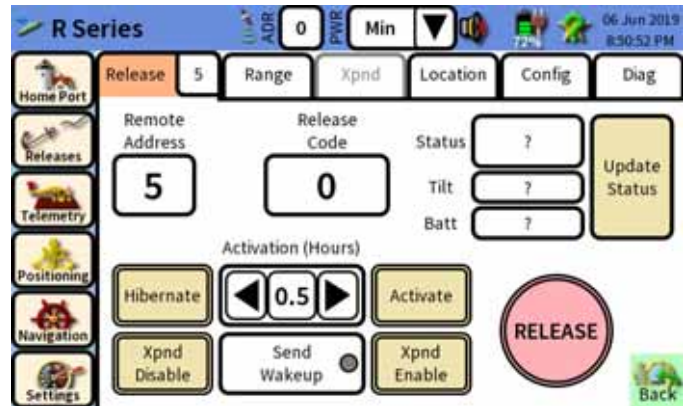


Figure 4-104 R Series Screen—Release Tab with Xpnd Disable and Xpnd Enable Buttons Visible

7. Release the Xpnd Enable button.

An information window temporarily opens with the message "Enabling tonal transponding on node <remote device address>." When enabled, another window temporarily opens with the message "R Series Transponder Mode Enabled." If enabling is not confirmed, an information window temporarily opens with the message "No response received from node <remote device address>."

To disable transponder emulation:

1. Refer to "Selecting the Address of a Remote Device" on page 4-44 and select the address and acoustic timeout for the R Series Release.
2. Touch the Release tab.

The Release tab opens with the Xpnd Disable and Xpnd Enable buttons visible as shown in Figure 4-104 on page 4-92.

3. Touch—and hold—the Xpnd Disable button.

Three short beeps followed by a long beep will be heard over about two seconds, and then the button will become highlighted.

4. Release the Xpnd Disable button.

An information window temporarily opens with the message "Disabling tonal transponding on node <remote device address>." When disabled, another window temporarily opens with the message "R Series Transponder Mode Disabled." If disabling is not confirmed, an information window temporarily opens with the message "No response received from node <remote device address>."



NOTE If testing an R Series Release in air, once transponder emulation is enabled, it may be difficult for the R Series Release to receive commands, such as when checking status or disabling transponder emulation. This situation is due to many factors, such as the resonance of the housing in air and strong multipath and weak coupling of sound in air. Attempting to position the topside transducer and the R Series Release transducer face to face and away from any hard surface may help.



NOTE If testing the R Series Release in air, set the lockout time of the UTS-9500 to 0. For instructions on how to set the lockout time, refer to "Configuring the Basic Topside Transponder Settings" on page 4-84.

GNSS Option

With the Global Navigation Satellite System (GNSS) option installed, and the included GNSS receiver module connected to the topside, the GNSS functions will be made available. To connect the GNSS receiver module to the topside, refer to "Connecting the Topside" on page 3-2. When connected, an information window temporarily opens indicating that the GNSS is connected and the baud rate that is used. In addition, the GNSS Status indicator on the Status and Control bar indicates that the GNSS is enabled.

Most of the GNSS functions are performed from the GNSS screen. The GNSS screen is composed of five tabs, and like all the screens, a Back button and the Status and Control bar. It is opened by selecting Navigation from the Menu bar, and then choosing GNSS. The five tabs, from left to right, are the following:

Position tab. The Position tab enables viewing of the current position of the topside, its speed and heading, a destination waypoint, and other information. Buttons are provided to set a destination to which to go, mark the current position of the topside, and access a plot where the position of the topside and the location of waypoints can be viewed as a plot. For more information on using the Position tab, refer to "Viewing the Current Position of the Topside" on page 4-96.

Satellites tab. The Satellites tab enables viewing of the relative positions of the tracked satellites on a graphical display and the signal data for each. A button is provided to enable the selection of the satellite system to view. For more information on using the Satellites tab, refer to "Viewing Tracked GNSS Satellite Information" on page 4-97.

Waypoints tab. The Waypoints tab provides a list of all the waypoints in the waypoint library by name, along with the latitude, longitude, depth, altitude, type, and the time and date created for each. Buttons are provided for adding a new waypoint, editing and deleting an existing waypoint, and selecting a waypoint as a destination waypoint. For more information on using the Waypoints tab, refer to "Creating and Managing Waypoints" on page 4-97.

Survey tab. The Survey tab provides the means to determine the location of a deployed remote device in latitude and longitude by acquiring multiple range measurements to the device during a survey around its approximate location. The Survey tab is composed of two subtabs, the Main tab and the Settings tab. On the Main tab buttons are provided for starting, pausing, recalculating, and stopping the survey, and clearing the survey data. Information about the device and the survey solution is also displayed. The Settings tab provides the means to enter information used in determining the ranges to the device. For more

information on using the Survey tab, refer to "Creating and Saving a Surveyed Waypoint" on page 4-109.

Config tab. The Config tab provides the means to select one or more satellite systems to use as well as displays information about the connected satellite receiver. For more information on using the Config tab, refer to "Selecting the GNSS" below.

Additional GNSS functions, when they are associated with a selected remote device, are performed from the Location tab of the device screen.

Selecting the GNSS

To select the GNSS:

1. Select Navigation from the Menu bar, and then choose GNSS.

The GNSS screen opens.

2. Touch the Config tab.

The Config tab opens as shown in Figure 4-105. The currently selected GNSS is displayed along with its status, type, baud rate, and version.

Type and version are displayed for a supported GNSS receiver only.

3. Touch the GNSS Search selection.

A drop-down list opens as shown in Figure 4-106.

4. Select the GNSS or combination of systems to use. The selections are available only if a supported GNSS receiver is connected.

An information window temporarily opens confirming the selection. The GNSS status, type, baud rate, and version are displayed in the Details area.

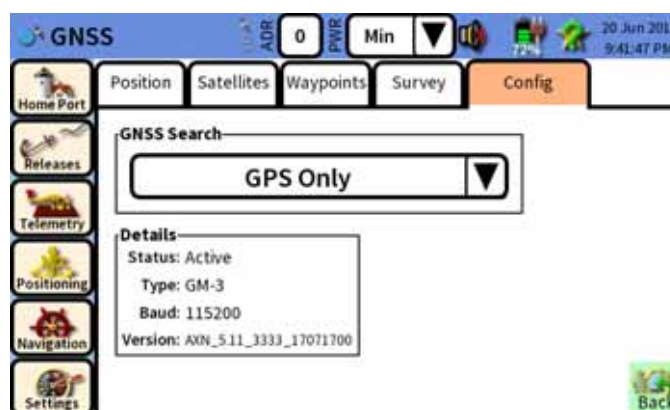


Figure 4-105 GNSS Screen—Config Tab



Figure 4-106 Config Tab—GNSS Search Drop-Down List

Viewing the Current Position of the Topside

To view the current position of the topside, select Navigation from the Menu bar, choose GNSS, and then select the Position tab. The GNSS screen opens to the Position tab as shown in Figure 4-107 where in the Position area the current position of the topside is displayed in latitude, longitude and altitude. Also displayed is the average speed at which the topside is moving based on the most recent two position

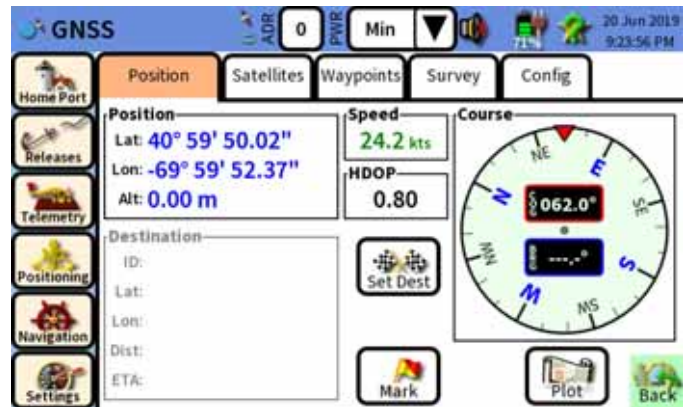


Figure 4-107 GNSS Screen—Position Tab

fixes. The position and speed units are in accordance with the settings on the Units tab of the UI Preference screen. If the topside is moving faster than the threshold speed determined by HDOP, which is defined below, the course over ground (COG) is displayed as a rotating compass dial where a fixed red pointer at the top points in the direction of travel relative to true north. The COG digital display within the compass dial also displays the course over ground numerically. In addition, the horizontal dilution of precision (HDOP) is displayed which indicates the amount of potential error in a GNSS position fix of the topside. The lower the number the tighter the fix. An indication of 1 or less is desirable.

If a destination waypoint has been selected, the waypoint name, latitude, longitude, distance, and estimated time of arrival (ETA) in hours, minutes and seconds based on the current speed of the topside are displayed in the Destination area as shown in Figure 4-108. A blue arrow on the compass dial points in the direction of the destination waypoint, and the BRG digital display displays the bearing to the waypoint relative to true north. To navigate to the destination waypoint, steer the vessel such that the blue arrow is aligned with the red pointer on the top and head in that direction. For instructions on how to select a destination waypoint, refer to "Selecting a Destination Waypoint" on page 4-107.

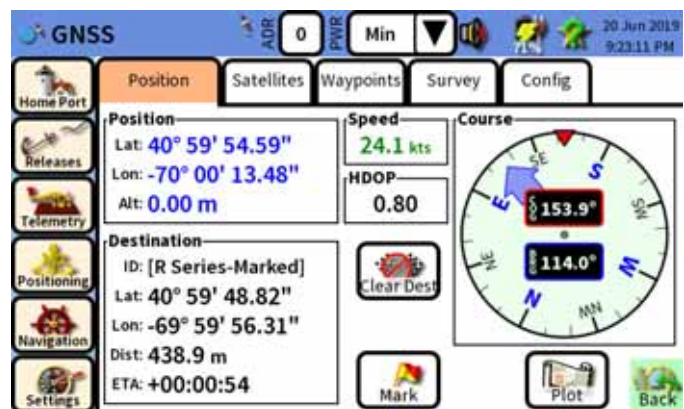


Figure 4-108 Position Tab—Destination Waypoint Selected

Viewing Tracked GNSS Satellite Information

To view information about tracked GNSS satellites, select Navigation from the Menu bar, choose GNSS, and then select the Satellites tab. The GNSS screen opens to the Satellites tab as shown in Figure 4-109 where a graphical display in the Satellites area indicates the relative positions of the received satellites for the selected GNSS, and a table in the Signal Data area lists signal data for each of them. The selected GNSS is displayed on the GNSS System button.

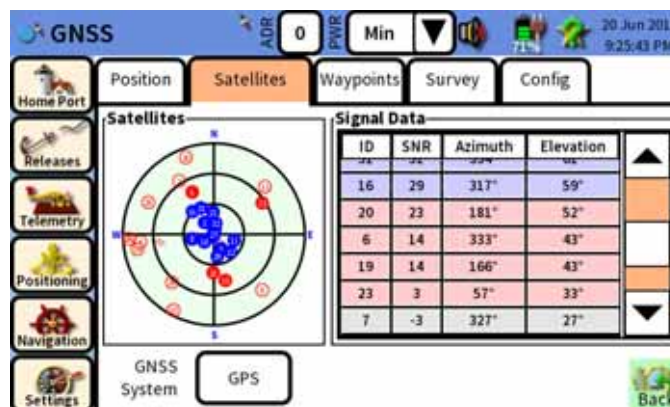


Figure 4-109 GNSS Screen—Satellites Tab

To select a different system, touch the button repeatedly until the system name is displayed. The satellite system must have been selected as described in "Selecting the GNSS" on page 4-95 for the satellite information to be shown. If the connected system has not been selected, or if no updates are being received, the graph is faded, no table is shown, and a warning icon is continuously flashed.

Tracked satellites are displayed on the graph as solid dots labeled with the space vehicle number (SVN). Those with a signal-to-noise ratio (SNR) of 25 or higher are displayed in one color. Those with an SNR less than 25 but greater than 0 are displayed in a different color. Satellites with a SNR of 0 or less are displayed as a hollowed dot in the first color. These satellites are known but are not being tracked. The table lists the SVN, the SNR, the Azimuth in degrees, and the Elevation in degrees for each tracked satellite and is sorted by SNR value, where the highest SNR is at the top of the table. Similar to the dots on the graph, the rows are shaded with the same colors. For those with a SNR of 0 or less, the shade is a variant of the background color.

Creating and Managing Waypoints

The topside uses the connected GNSS to create and save waypoints marking the current position of the topside and the location of deployed remote devices. A waypoint is composed of latitude, longitude, depth, and altitude information. There are three waypoint categories:

Entered. A manually entered waypoint that is either general or device-associated.

Marked. A waypoint identifying the current location of the topside at the time the waypoint is created and is either general or device-associated.

Surveyed. A waypoint that is determined by performing a survey of a remote device and is device-associated.

A general waypoint is not associated with any device. It is created manually, copied from any other waypoint or marked as the position of the topside. A device-associated waypoint is associated with a remote device type, such as an R Series, an ATM-9XX, a Compact Modem, and others. Device-associated waypoints are part of a device's dataset, which includes other attributes such as node address and release code, and they can be saved as startup defaults or user presets just as with all other device-associated data. All Entered waypoints can be edited, copied and deleted. All Marked and Surveyed waypoints can be copied and deleted only. They cannot be edited. When created, all waypoints are saved to the waypoint library and are viewable on the Waypoints tab of the GNSS screen. Any number of general waypoints can exist in the waypoint library, but only one waypoint can exist in each of the three waypoint categories for each remote device type. Any waypoint in the waypoint library can be selected as a destination waypoint.

Creating and Saving an Entered General Waypoint

An Entered general waypoint is created and saved by manually entering it and saving it to the waypoint library. It is not associated with any device. To create and save an Entered general waypoint, select Navigation from the Menu bar, choose GNSS, and then select the Waypoints tab. Verify that no waypoint is selected. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the waypoints. If a waypoint is selected, touch the selection to deselect it, and then touch the Add New button. The Add New Waypoint window opens as shown in Figure 4-110. If desired, enter a different name by touching the automatically assigned name and entering the new

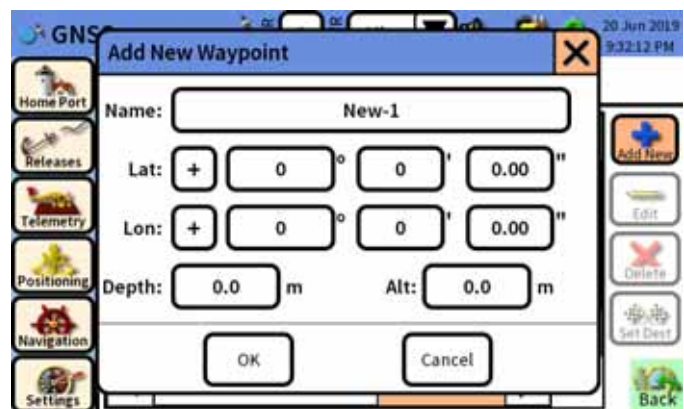


Figure 4-110 Add New Waypoint Window—Entered Waypoint

name using the keyboard that opens. Enter the latitude, longitude, depth, and altitude settings for the waypoint, where the format for these settings is in accordance with the settings on the Units tab of the UI Preference screen, and then touch OK. An information window temporarily opens indicating that the waypoint is added, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

Creating and Saving an Entered Device-Associated Waypoint

An Entered device-associated waypoint is created and saved by selecting the device type, and then manually entering the waypoint and saving it to the waypoint library. When viewing the waypoints in the waypoint library on the Waypoint tab, an Entered device-associated waypoint name is shown in brackets, and it includes the device type and the automatically assigned extension "Entered." If an Entered device-associated waypoint is already in the waypoint library for this device type, and a new one is created and saved, it will be replaced.

To create and save an Entered device-associated waypoint:

1. Select Positioning from the Menu bar, select Location, and then choose a device type.

The device screen opens to the Location tab.

2. Touch the Select Coordinate Set selection and select Entered from the drop-down list as shown Figure 4-111.

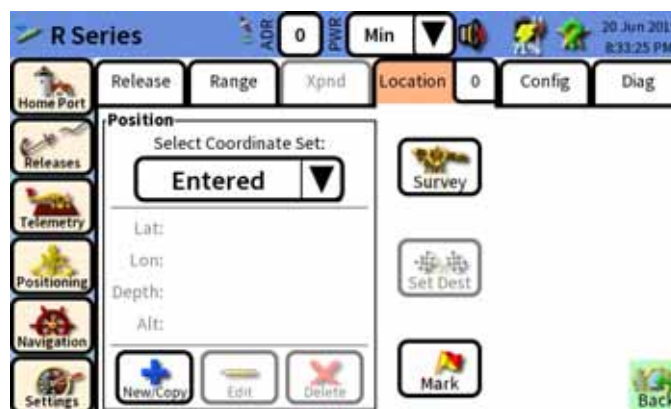


Figure 4-111 Location Tab—Entered Selected

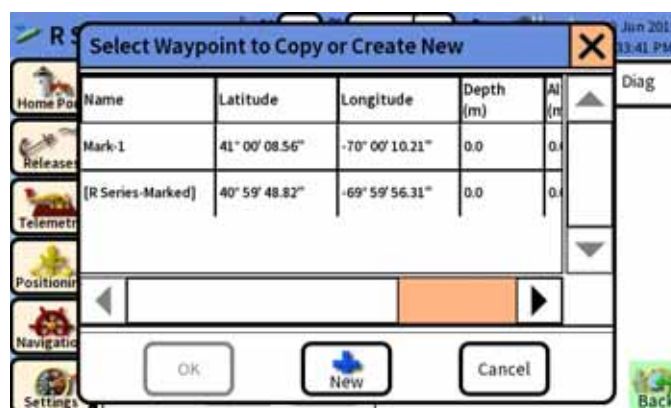


Figure 4-112 Location Tab—Select Waypoint to Copy or Create New Window

3. Touch the New/Copy button.

The Select Waypoint to Copy or Create New window opens as shown in Figure 4-112 on page 4-99.

4. Touch the New button.

The Edit Entered Location window opens as shown in Figure 4-113.

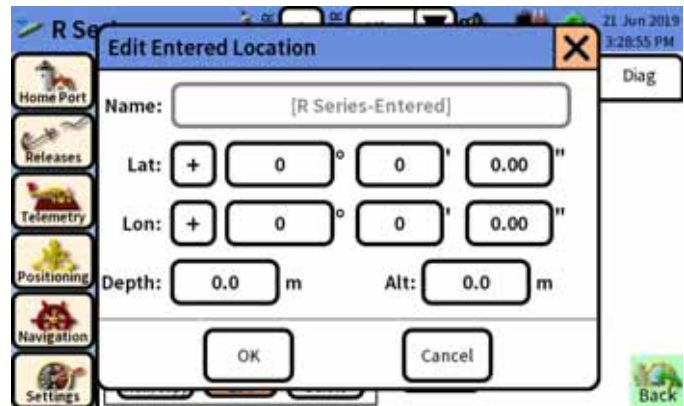


Figure 4-113 Location Tab—Edit Entered Location Window

5. Enter the latitude, longitude, depth, and altitude settings for the waypoint, where the format for these settings is in accordance with the settings on the Units tab of the UI Preference screen, and then touch OK.

The latitude, longitude and altitude is displayed in the Position area as shown in Figure 4-114, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

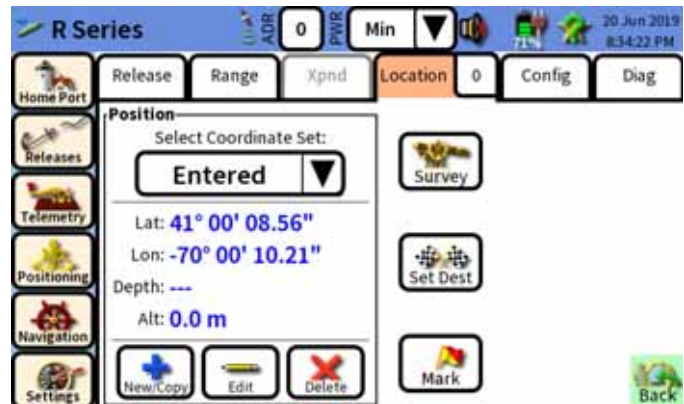


Figure 4-114 Location Tab—Entered Device-Associated Waypoint Displayed

Creating and Saving a Marked General Waypoint

A Marked general waypoint is a waypoint corresponding to the current location of the topside at the time the waypoint is created. It is saved to the waypoint library and is not device-associated. It can be created and saved by selecting Navigation from the Menu bar and choosing Mark; by selecting Navigation from the Menu bar, selecting GNSS, selecting the Position tab on the GNSS screen, and then touching the Mark button; or by selecting Navigation from the Menu bar, choosing Plot, and then touching the Mark button on the Plot screen. The Add New Waypoint window opens as shown in Figure 4-115. The name of the waypoint will be automatically entered as "Mark-1" for the first waypoint created, "Mark-2" for the second, "Mark-3"

for the third and so on. If desired, enter a different name by touching the automatically assigned name and entering the new name using the keyboard that opens. Also if desired, edit the latitude, longitude, depth, and altitude settings for the waypoint, where the format for these settings is in accordance with the settings on the Units tab of the UI Preference screen, and then touch OK. An information window temporarily opens indicating that the waypoint is added, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

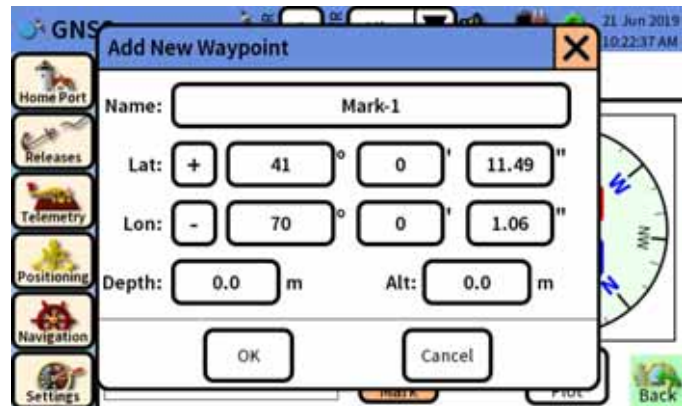


Figure 4-115 Add New Waypoint Window

Creating and Saving a Marked Device-Associated Waypoint

A Marked device-associated waypoint is a waypoint corresponding to the current location of the topside at the time the waypoint is created and is created and saved when a remote device is deployed to mark its approximate location. The waypoint is saved to the waypoint library. When viewing the waypoints in the waypoint library on the Waypoints tab, a Marked device-associated waypoint name is shown in brackets, and it includes the device type and the automatically assigned extension "Marked." If a Marked device-associated waypoint is already in the waypoint library for this device type, and a new one is created and saved, it will be replaced.

To create and save a Marked device-associated waypoint:

1. Select Positioning from the Menu bar, select Location, and then choose a device type. The device screen opens to the Location tab.
2. Touch the Select Coordinate Set selection and select Marked from the drop-down list as shown in Figure 4-116.

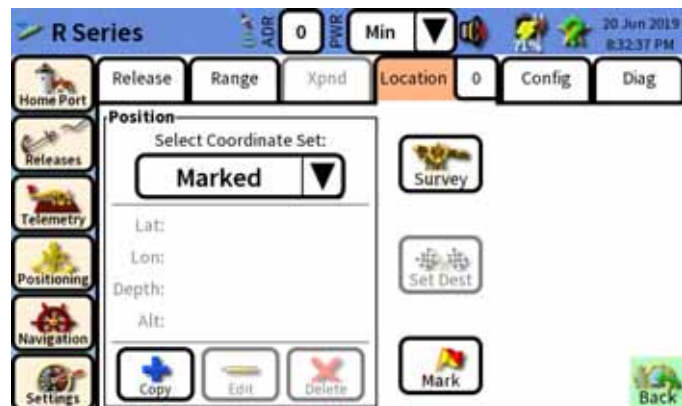


Figure 4-116 Device Screen—Location Tab

3. Touch the Mark button.

The Confirm Mark Location window opens as shown in Figure 4-117.



Figure 4-117 Confirm Mark Location Window

4. Touch OK.

The latitude, longitude and altitude is displayed in the Position area as shown in Figure 4-118, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

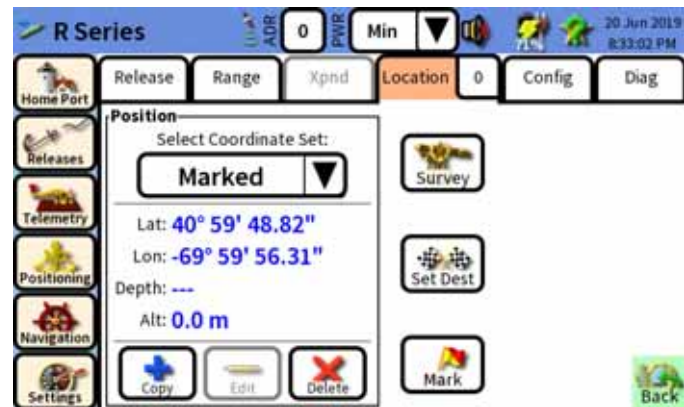


Figure 4-118 Location Tab—Device-Associated Marked Waypoint Displayed

Copying a Waypoint

Any waypoint in the waypoint library can be copied and saved under another name. It will be copied and saved as a general waypoint and therefore will not be associated with any device. Any waypoint can also be copied to the Entered waypoint category of the currently selected device type or a different device type. A Marked or Surveyed waypoint can only be copied to the Marked or Surveyed waypoint category, respectively, of the currently selected device type or a different device type.

To copy a waypoint as a general waypoint:

1. Select Navigation from the Menu bar, select GNSS, and then touch the Waypoints tab.

The Waypoints tab opens.

2. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the waypoints.

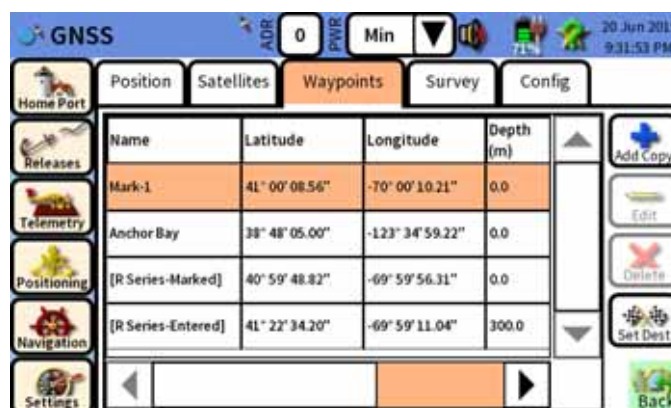


Figure 4-119 Waypoints Tab—Waypoint Selected

3. Select the waypoint to copy as shown in Figure 4-119, and then touch the Add Copy button.

The Add New Waypoint window opens as shown in Figure 4-120. The name of the waypoint will be automatically copied with the extension "Copy" added. If copied again, "Copy-1," and again, "Copy-2" and so on. If desired, enter a different name by touching the automatically assigned name and entering the new name using the keyboard that opens. Also if desired, edit the latitude, longitude, depth, and altitude settings for the waypoint, and then touch OK. An information window temporarily opens indicating that the waypoint is added, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

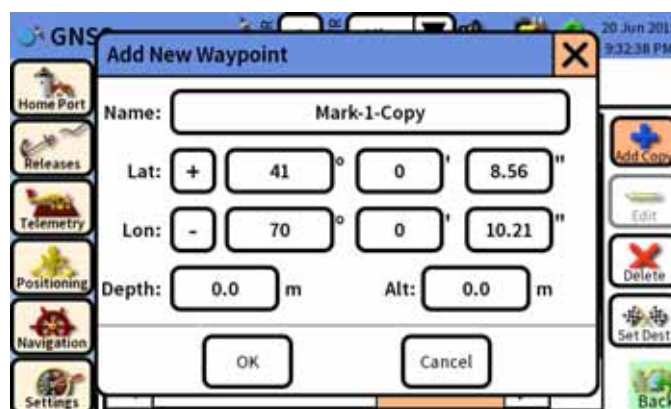


Figure 4-120 Add New Waypoint Window—Copying a Waypoint

To copy a waypoint as an Entered, Marked or Surveyed device-associated waypoint:

1. Select Positioning from the Menu bar, select Location, and then choose a device type to copy the waypoint to.
The device screen opens to the Location tab.
2. Touch the Select Coordinate Set selection and select the waypoint category from the drop-down list as shown in Figure 4-121. This selection is the waypoint category to which the waypoint will be copied.

3. Touch the copy button.

The Select Waypoint to Copy window opens. Only those waypoints of the selected waypoint category will be listed, except for the Entered category, where all the waypoints will be listed.

4. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the waypoints.

5. Select the waypoint to copy, and then touch OK.

The latitude, longitude and altitude is displayed in the Position area as shown in Figure 4-122, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab. The waypoint name will be shown in brackets and will include the automatically assigned extension "Entered," "Marked"

or "Surveyed" in accordance with the waypoint category. If an Entered, Marked or Surveyed device-associated waypoint is already in the waypoint library for this device type, and a new one is created and saved, it will be replaced.

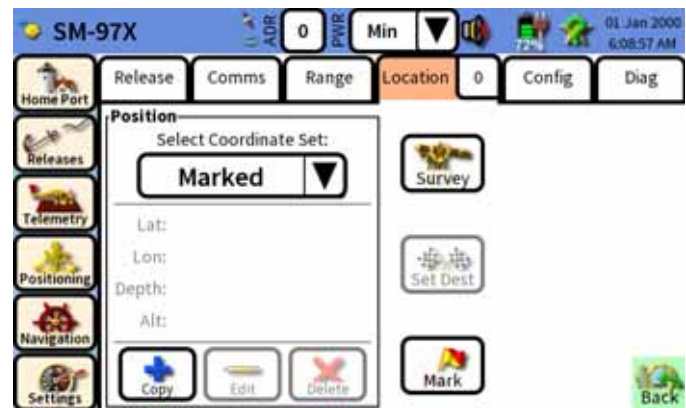


Figure 4-121 Device Screen—Location Tab

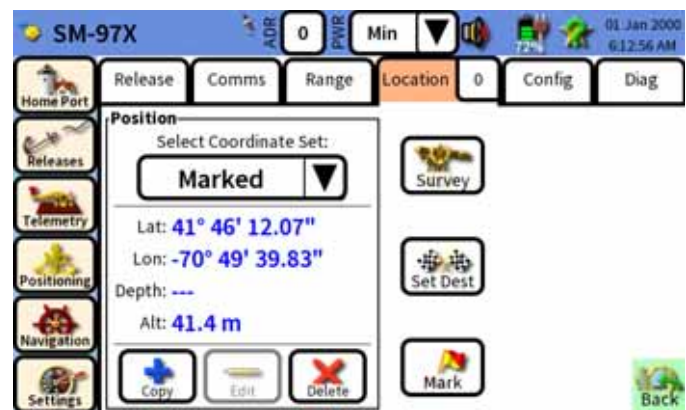
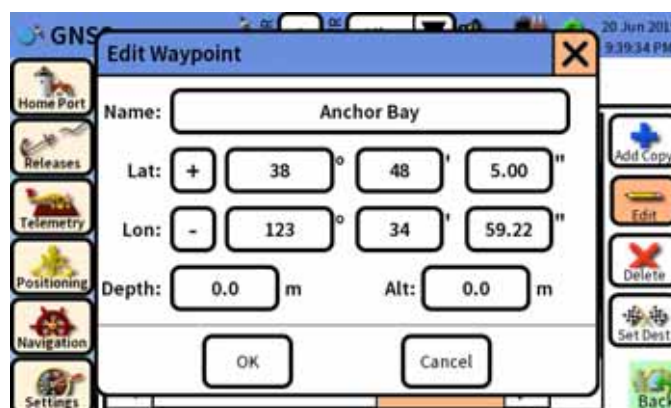


Figure 4-122 Location Tab—Copied Waypoint Displayed

Editing an Entered General Waypoint

Entered general waypoints in the waypoint library are edited directly from the Waypoints tab. Entered device-associated waypoints are edited from the Location tab of the corresponding device screen. To edit an Entered general waypoint, select Navigation from the Menu bar, choose GNSS, and then select the Waypoints tab. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of

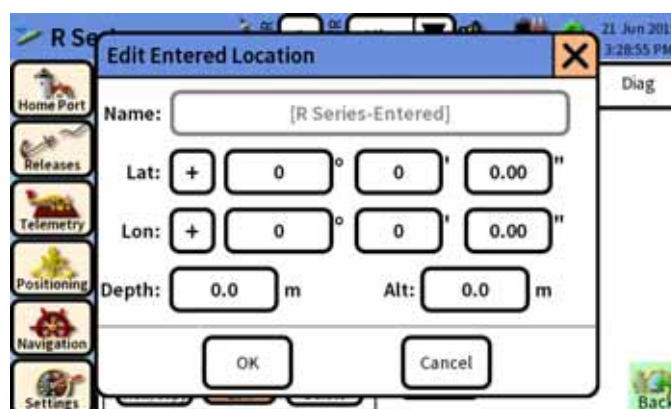
the waypoints. Select the waypoint to edit, and then touch the Edit button. The Edit Waypoint window opens as shown in Figure 4-123. Make the changes, and then touch OK.



**Figure 4-123 Edit Waypoint Window—
Editing a General Waypoint**

Editing an Entered Device-Associated Waypoint

Entered device-associated waypoints in the waypoint library are edited from the Location tab of the corresponding device screen. To edit an Entered device-associated waypoint, select Positioning from the Menu bar, select Location, and then select the device type. The device screen opens to the Location tab. Select Entered from the Select Coordinate Set drop-down list, and then touch the Edit button. The Edit Entered Waypoint window opens as shown in Figure 4-124. Make the changes, and then touch OK. The latitude, longitude and altitude is displayed in the Position area of the Location tab, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.



**Figure 4-124 Edit Entered Location
Window**

The latitude, longitude and altitude is displayed in the Position area of the Location tab, and the waypoint is saved to the waypoint library where it can be viewed on the Waypoints tab.

Deleting a General Waypoint

General waypoints are deleted directly from the Waypoints tab. Device-associated waypoints are deleted from the Location tab of the corresponding device screen. To delete a general waypoint, select Navigation from the Menu bar, choose GNSS, and then select the Waypoints tab. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the

scroll bar up or down to view all of the waypoints. Select the waypoint to delete, and then touch the Delete button. The Confirm Waypoint Deletion window opens as shown in Figure 4-125. Touch OK to confirm.



Figure 4-125 Confirm Waypoint Deletion Window

Deleting a Device-Associated Waypoint

Device-associated waypoints in the waypoint library are deleted from the Location tab of the corresponding device screen.

To delete a device-associated waypoint:

1. Select Positioning from the Menu bar, select Location, and then choose a device type.

The device screen opens to the Location tab.

2. Touch the Select Coordinate Set selection and select the waypoint category from the drop-down list as shown in Figure 4-126.

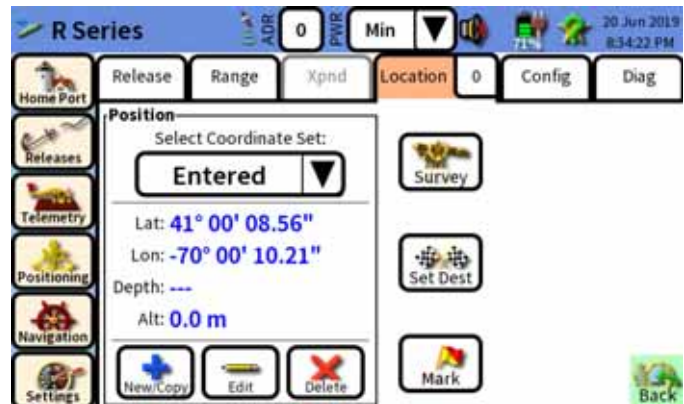


Figure 4-126 Location Tab—Entered Device-Associated Waypoint Displayed

3. Touch the Delete button. The Delete button will not be available if there is no waypoint for the device type in the selected category.

The Confirm Entered Location Delete window opens as shown in Figure 4-127.

4. Touch OK to confirm.

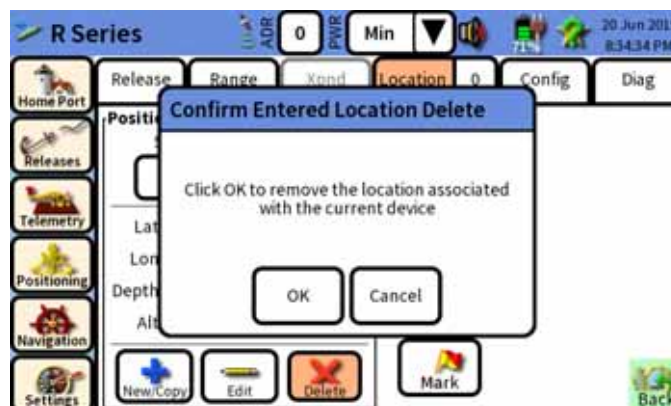


Figure 4-127 Confirm Entered Location Delete Window

Selecting a Destination Waypoint

Any waypoint in the waypoint library can be selected as a destination waypoint to go to. While transiting to the destination waypoint, the position of the topside and the location of the destination waypoint and any other waypoints in the vicinity can be viewed on a plot as described in "Viewing a Destination Waypoint on the Plot" on page 4-115. Once the destination is reached, the waypoint can be cleared.

To select a destination waypoint:

1. Select Navigation from the Menu bar, choose GNSS, and then touch the Position tab.

The Position tab opens as shown in Figure 4-128.

2. Touch the Set Dest button.

The Select Destination Waypoint window opens. The Select Destination Waypoint window can also be opened by selecting Navigation from the Menu bar, and then choosing Set Dest. The Set Dest button is also available from the Waypoints tab of the GNSS screen and the Location tab of a device screen.

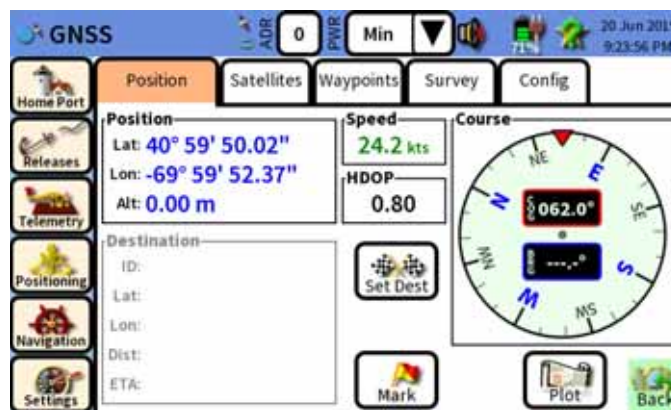


Figure 4-128 GNSS Screen—Position Tab

3. If more waypoints are listed that can be viewed at once, a vertical scroll bar appears. Touch and drag the white scroll box inside the scroll bar up or down to view all of the waypoints.

4. Select the waypoint as shown in Figure 4-129, and then touch OK.

An information window temporarily opens indicating that the destination is set, and then the waypoint name, latitude and longitude, distance to the waypoint, and the estimated time of arrival (ETA) is displayed in the Destination area of the Position tab as shown in Figure 4-130. The ETA is displayed only if the vessel is moving toward the waypoint.

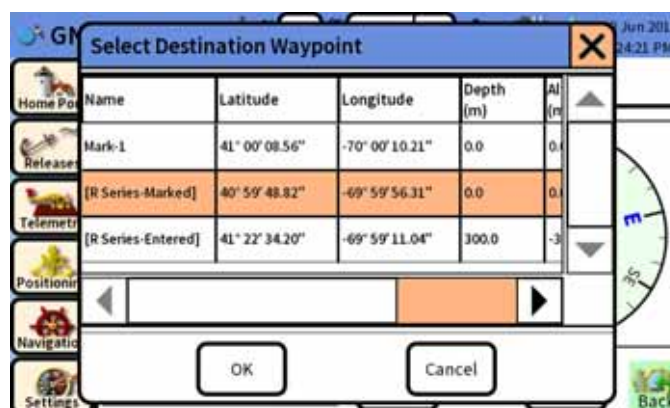


Figure 4-129 Select Destination Waypoint Window—Waypoint Selected

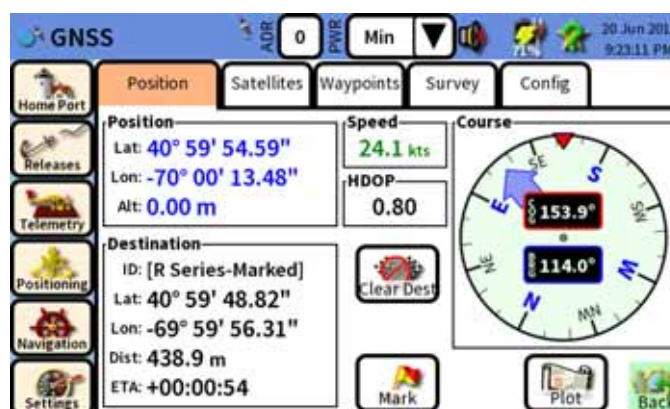


Figure 4-130 Position Tab—Destination Waypoint Information Displayed

5. To clear the destination, touch the Clear Dest button.
6. The Confirm Cancellation window opens as shown in Figure 4-131.
7. Touch OK.

A temporary information window opens confirming that the destination waypoint is cleared.

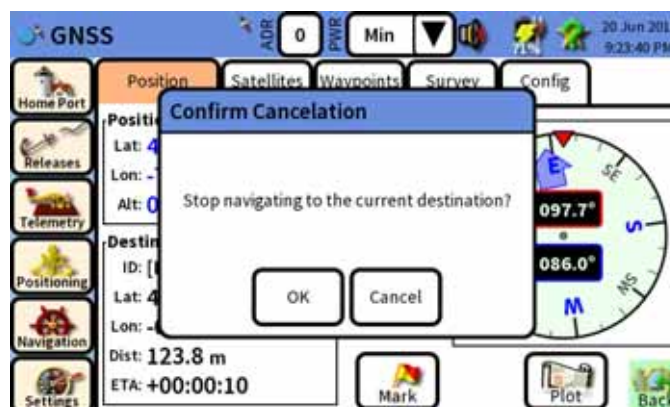


Figure 4-131 Confirm Cancellation Window

Creating and Saving a Surveyed Waypoint

Based on multiple range measurements to a deployed remote device, its location in latitude and longitude and its depth and altitude can be determined from a survey. Ranges are acquired acoustically using broadband ranging or tonal transponding. Once determined, this information is saved to the waypoint library. A Surveyed waypoint is always device-associated. When viewing the waypoints in the waypoint library, a Surveyed waypoint name is shown in brackets, and it includes the device type and the automatically assigned extension "Surveyed." If a Surveyed waypoint is already in the waypoint library for this device type, and a new one is created and saved, it will be replaced. During a survey the position of the topside can be viewed as a real-time plot as described in "Viewing a Survey as a Plot" on page 4-115.

To create and save a Surveyed waypoint:

1. Select Positioning from the Menu bar, select Survey, and then choose a device type.

The GNSS screen opens to the Survey tab as shown in Figure 4-132. The device to be surveyed is displayed along with its remote address if applicable in the Target area. The Survey tab on the GNSS screen can also be accessed by selecting Positioning from the Menu bar, selecting Location, selecting the device type, and then touching the Survey button on the Location tab.

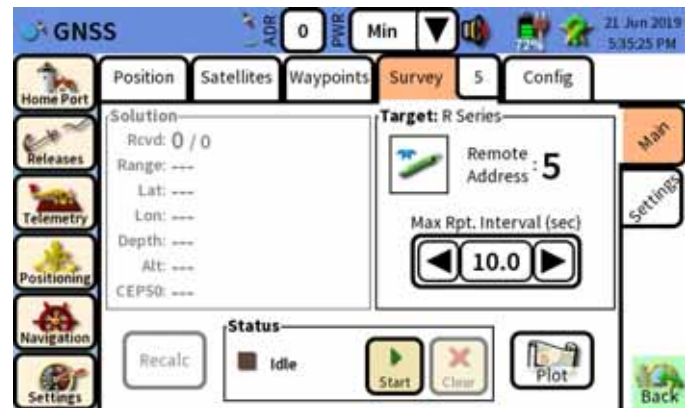


Figure 4-132 GNSS Screen—Survey Tab

2. For a device that has an address, touch the button on the Survey tab, and then enter the new address using the keypad that opens.
3. Tap or touch and hold the left or right arrow of the Max Rpt. Interval setting in the Target area to set the *maximum* time in seconds between broadband range interrogations. For devices that are configured for tonal transpond, this setting is a fixed time interval.
4. Touch the Settings tab.

The Survey/Settings tab opens as shown in Figure 4-133. On this tab only the settings that are applicable to the selected device type will be available.

5. In the Vessel area, tap or touch and hold the left or right arrow of the Transducer Depth setting to set the depth below mean sea level of the topside transducer. An accurate transducer Depth setting increases the accuracy of the survey.

6. In the Vessel area, tap or touch and hold the left or right arrow of the Mean Sea Level setting to set the mean sea level altitude referenced to the WGS84 datum to use for the survey area. This setting is typically zero except when surveying in lakes located above or below sea level.

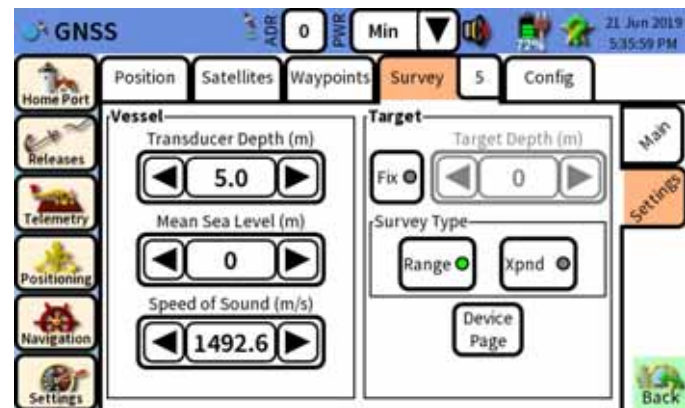


Figure 4-133 GNSS Screen—Survey/Settings Tab

7. In the Vessel area, tap or touch and hold the left or right arrow of the Speed of Sound setting to set the speed of sound used in the range calculations. This setting will automatically adjust the speed of sound setting made on the Topside screen as described in "Setting the Speed of Sound in Water" on page 4-14 to the same value.
8. If the depth of the device being surveyed is known, touch the Fix button in the Target area such that the indicator on the button is lit, and then tap or touch and hold the left or right arrow of the Target Depth setting to set the depth, or touch the depth setting and enter the depth using the keypad that opens. Setting the depth speeds up the range calculations and can result in more accurate position fixes. If the depth is not set, it is calculated automatically.
9. In the Survey Type area touch the Range button such that the indicator on the button is lit to select broadband ranging, or touch the Xpnd button such that the indicator on the button is lit to select tonal transponding. Depending on the selected device type, only one of these options may be available and will be selected automatically.
10. If it is required to edit the settings for the selected device type or to verify the transmit and receive frequencies for tonal transponding, touch the Device Page button, make the changes, and then touch the Back button to return.
11. Touch the Main tab.
The Survey tab opens as shown in Figure 4-132 on page 4-109.
12. In the Status area, touch the Start button.

The survey starts, and in the Solution area the number of received replies against the number of interrogations transmitted along with the most recent range calculation is displayed as shown in Figure 4-134.

Typically a "little e" type survey is performed where the survey vessel navigates in a circle around the estimated location of the deployed device and then finishes by crossing over it, bisecting the circle. The diameter of the circle should be at least as great as the estimated depth of the device, and the vessel speed should be 4 knots or less. This type of survey is best performed when the topside transducer is fixed to the hull of the vessel. When the transducer is not fixed to

the hull and is just deployed over the side, a box survey is the best choice. In a box survey the vessel acquires multiple ranges at each of the four corners of a box, and at its center, which is the estimated location of the remote device. The distance between opposite corners should be at least as great as the estimated depth of the device, and the number of ranges acquired at each of the corners should be approximately the same. The survey is paused between corners by touching the Pause button as shown in Figure 4-135, and then restarted by touching the Resume button. The remaining fields are filled and are continuously updated when sufficient data are present to determine a solution as shown in Figure 4-136. The fields are composed of the latitude and longitude of the device, its depth and altitude, and the CEP50 (circular error probable 50%).

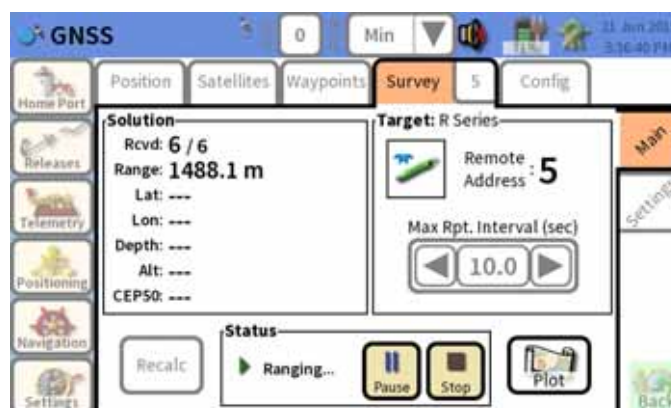


Figure 4-134 Survey Tab—Start of Survey

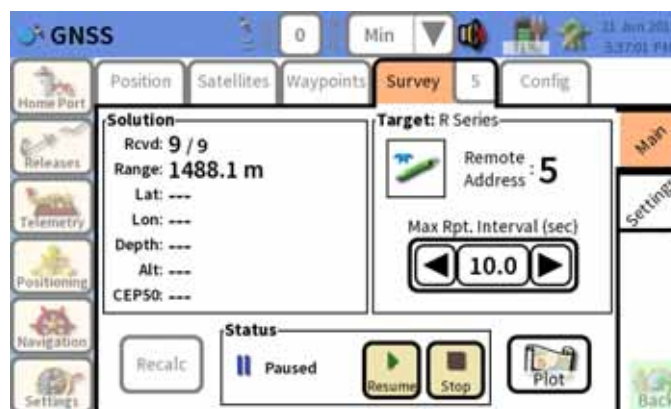


Figure 4-135 Survey Tab—Survey Paused



NOTE During the survey it will not be possible to switch remote devices or to open some screens. When stopped, all the screens will again be available.

13. To finalize the survey location, touch the Stop button.

The Confirm Survey Stop window opens as shown in Figure 4-137.

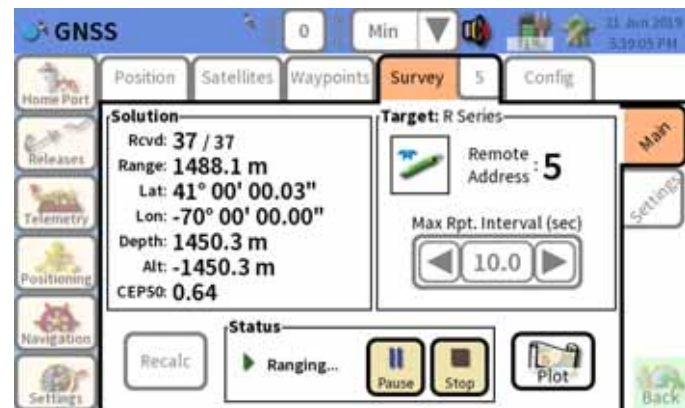


Figure 4-136 Survey Tab—Survey Running with Solution Determined

14. Touch OK.

If a solution has been determined, the Use Surveyed Position? window opens as shown in Figure 4-138. If a solution has not been determined, a temporary information window opens indicating that no surveyed location could be determined.

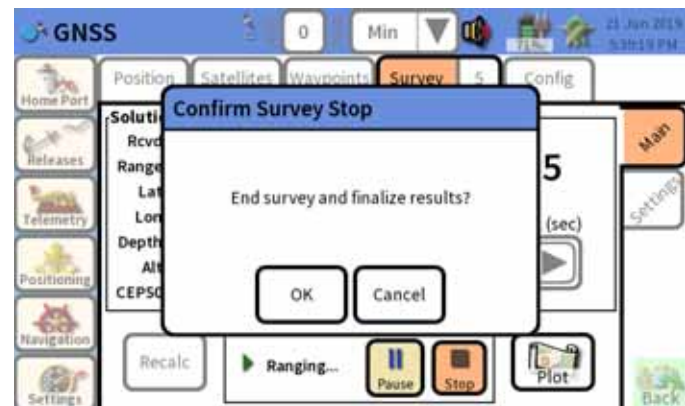


Figure 4-137 Confirm Survey Stop Window

15. Touch OK to use this location.

An information window temporarily opens confirming the set location, and the surveyed waypoint is saved to the waypoint library.

16. If desired, edit any of the settings on the Settings tab, and then touch the Recalc button on the Main tab to recalculate the solution.

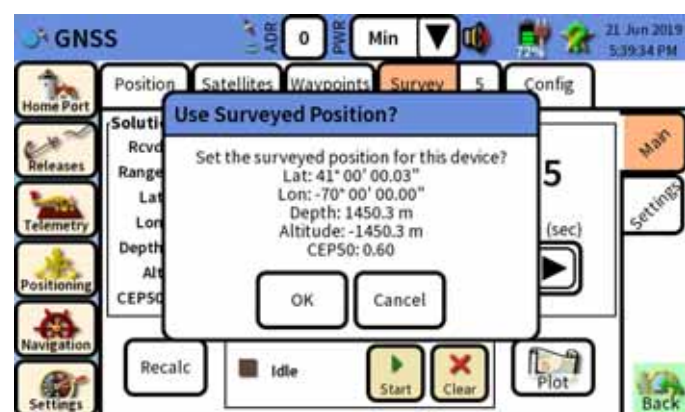


Figure 4-138 Use Surveyed Position? Window

17. To clear the survey data, touch the Clear button.

The Confirm Survey Clear window opens as shown in Figure 4-139.

18. Touch OK to confirm.

An information window temporarily opens confirming the clearing of the survey data. With the survey data cleared, the survey solution is no longer displayed.

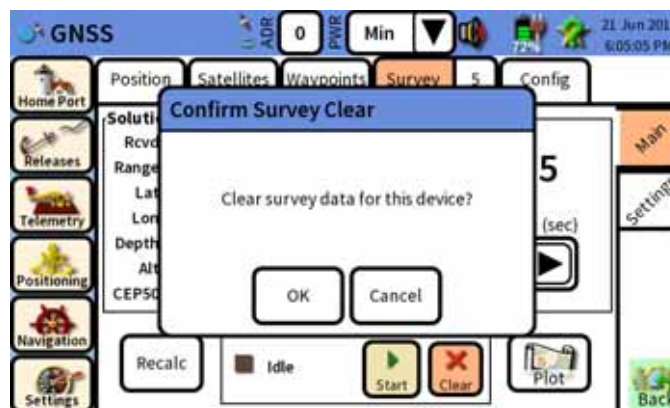


Figure 4-139 Confirm Survey Clear Window

Viewing Plots

The current topside position, as reported by the attached GNSS receiver module, and the location of any waypoint in the waypoint library can be viewed as a plot on the Plot screen. The Plot screen can be accessed by selecting Navigation from the Menu bar and choosing Plot. It can also be accessed during survey operations by touching the Plot button on the Survey tab of the GNSS screen.

Using the Plot Controls

The Plot screen provides the following plot controls:

Zoom control. Zooms in or out of the plot. To zoom in on the plot, touch and drag the Zoom slider up; to zoom out of the plot touch and drag the Zoom slider down. Touch anywhere inside control to move the slider to that location. When zooming in close, finer control is available; when zooming out far, the more coarse the control.

Pan. To pan the plot touch, and *slowly* slide anywhere on the plot.

Track Vessel button. Continuously positions the boat icon at the center of the plot as shown in Figure 4-140 or reacquires it and places it at the center if it is off the plot. To activate touch the Track Vessel button such that the indicator on the

button is lit. To disable this feature, touch and drag the plot or touch the Track Vessel button again.

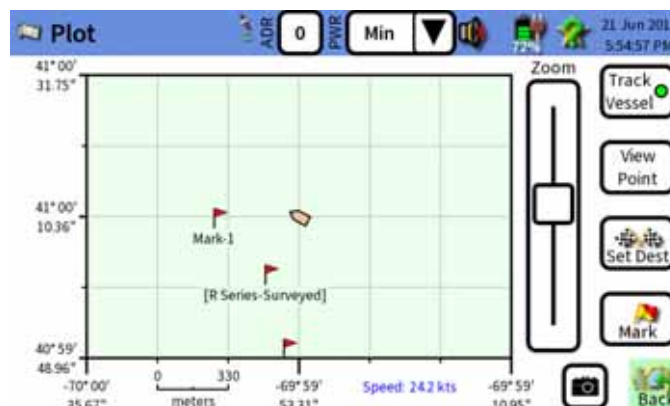


Figure 4-140 Plot Screen—Survey Vessel at Center of Graph

View Point button. Enables the selection of a waypoint to position at the center of the plot along with any neighboring waypoints within the displayed plot boundaries. To activate touch the View Point button. The Select Waypoint to View window opens as shown in Figure 4-141. Select the waypoint, and then touch OK. The waypoint will be positioned at the center of the plot as shown in Figure 4-142. Touch the Track Vessel button such that the indicator on the button is lit to return to the current location of the topside.

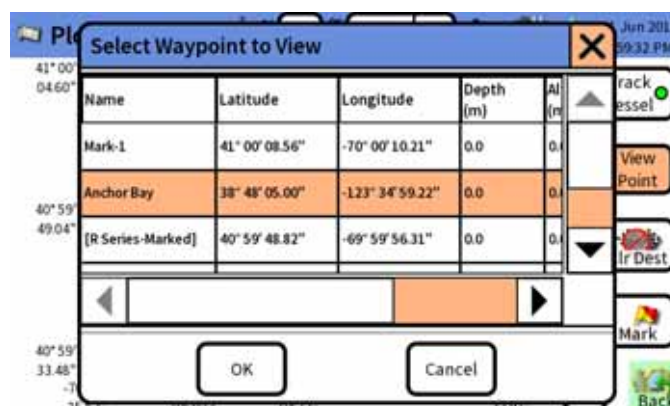


Figure 4-141 Select Waypoint to View Window

Camera icon button. To save a screen shot of the plot, touch the button with the camera icon. To transfer the saved screen shots to a USB flash drive, refer to "Transferring a Log File" on page 4-32.

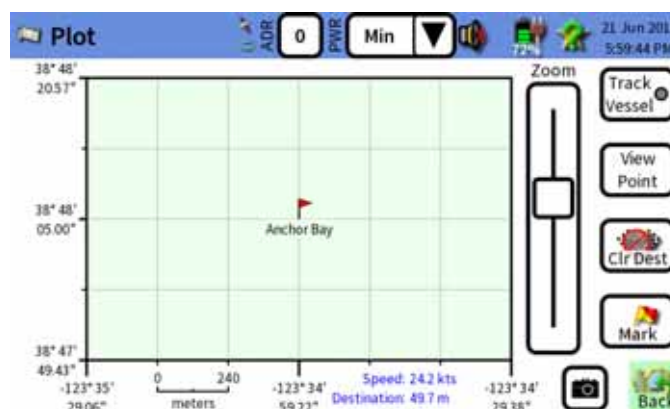


Figure 4-142 Plot Screen—Waypoint at Center of Graph

Viewing a Destination Waypoint on the Plot

When a destination waypoint is set, it is marked on the plot with a checkered flag as shown in Figure 4-143 with the base of the pole as the actual location. It is also labeled with the name of the selected waypoint. The distance to the waypoint is displayed at the bottom right of the plot. An arrow on the boat icon indicates the direction to the waypoint.

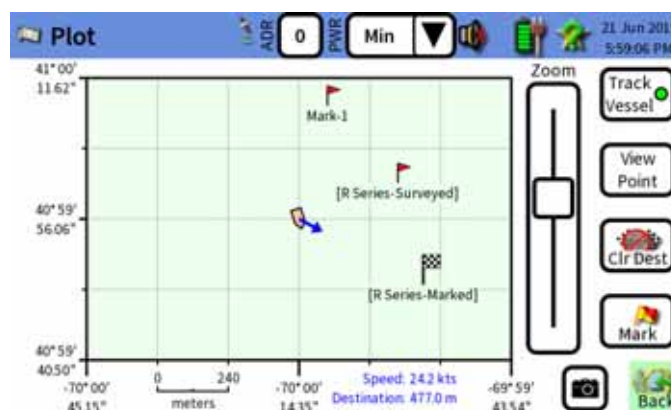


Figure 4-143 Plot Screen—Destination Waypoint Shown as Checkered Flag

Viewing a Survey as a Plot

The Plot screen displays the current position of the topside and a plot of its path. The most recently acquired position is marked with a boat icon, and if the topside is moving, the boat icon is shown pointed in the direction of travel. A dot marks the position of the topside for

each received reply. Shown in Figure 4-144 is a circular survey being performed around an R Series Release. The estimated location of the release has been marked with a red pennant and labeled "[R-Series Marked]." The base of the pole

is the marked location. Shown in Figure 4-145 is a survey in process with the solution displayed. The grid spacing of the plot is automatically set by the position of the Zoom control on the screen. A distance scale is included at the bottom left of the plot which is also in accordance with the Zoom setting. The speed of the survey vessel is displayed at the bottom right of the plot. The latitude and longitude values, the distance scale units, and the speed units are in accordance with the settings on

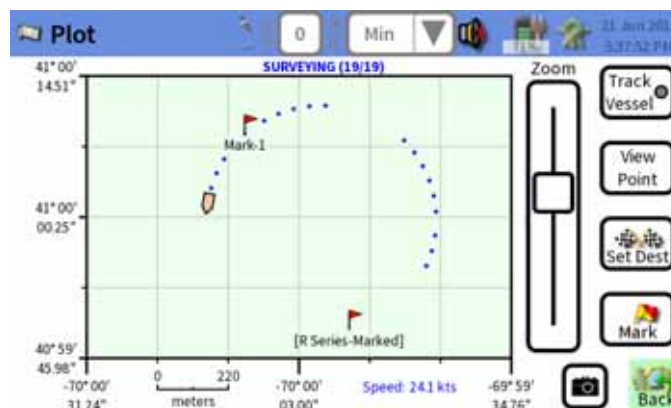


Figure 4-144 Plot Screen—Survey in Process

the Units tab of the UI Preference screen. At the top of the plot, "SURVEYING" is displayed during a survey, along with the number of received replies against the number of interrogations transmitted.

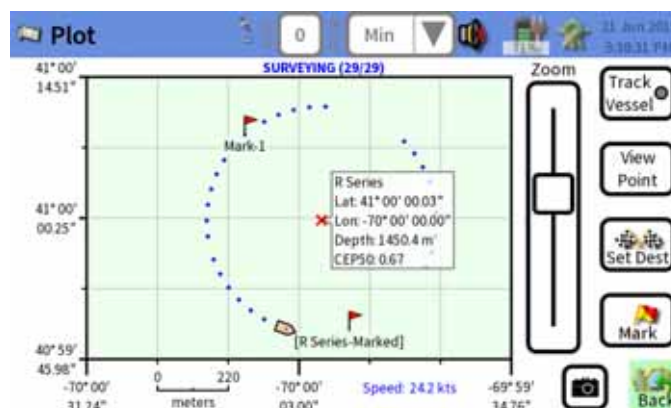


Figure 4-145 Plot Screen—Survey in Process with the Solution Displayed

5 Care and Maintenance

This section includes the recommended care and maintenance procedures for the UTS-9500 Universal Topside. Adherence to these recommendations will help to ensure years of continuous, reliable performance. The care and maintenance of the topside encompasses general cleaning and inspection. In addition, procedures are provided for calibrating the touch screen display, updating the topside firmware and factory resetting the topside. Other than for the two power line fuses, the topside does not contain any user serviceable components.

Topside Cleaning and Inspection

The only required maintenance for the topside is to occasionally clean the front panel, including the touch screen display, with a dampened, lint-free cloth or paper towel. In addition, check the two vent ports for any obstructions and verify that the front panel screws are secure.

Transducer Cleaning and Inspection

After retrieving the transducer, clean and inspect it as follows:

1. Unplug the transducer cable from the transducer. Inspect and clean the cable.
2. Lubricate the transducer connector pins with a light coat of silicone lubricant, and then install the supplied dummy connector.



CAUTION Be especially careful not to get any lubricant on the face of the transducer as doing so will severely degrade its performance.

3. Wash down the transducer with clean, *fresh* water and remove any debris that may have become attached to the housing.
4. Clean the transducer with a mild, non-abrasive detergent, being careful to remove any buildup. Do not use an ammonia-based cleaner such as glass cleaner. Wash the transducer again with fresh water.
5. Carefully inspect the transducer for any signs of damage.

Battery Maintenance and Charging

Depending on use, the life of the battery in the topside is typically five years and 300 charge/discharge cycles. To charge the battery, connect the topside to the power source. Charging should be performed indoors in a temperature range of 0°C–50°C and a relative humidity of less than 80%. Charging will not occur if the temperature is outside of this range. Prior to placing the UTS-9500 in storage, charge the battery to 40-60%, and be sure to adhere to the recommended nonoperating temperature range of -20°C–60°C while in storage. Although there is no specific requirement for charging the battery after the UTS-9500 is removed from storage, it is recommended to verify that it can be charged before deployment.



NOTE The Li-Ion battery used in the topside has an initial capacity of 2.5 A·h. As the battery ages and is subjected to charge/discharge cycles, its capacity will reduce. However, the battery is specified to retain at least 2.5 A·h capacity after 300 charge/discharge cycles. Observing the temperature limits outlined in Section 2, "Specifications," will help ensure the specified capacity is maintained.



NOTE The Li-Ion battery used in the topside is not user replaceable. Should the battery require replacing, contact Teledyne Benthos.

Replacing the Power Line Fuses

The PWR connector of the topside includes two power line fuses, one each for the Line and Neutral sides of the AC lines. The fuses are Schurter, Inc. 6.3 A, 250 VAC, 5 x 20 mm glass, P/N 0034.3125 (or equivalent). Refer to Figure 1-2 on page 1-5 for the location of the PWR connector, and refer to Figure 3-1 on page 3-3 for the location of the fuses. To replace either fuse, insert a flat head screw driver blade of appropriate size into the fuse cap and turn it counterclockwise, allowing the cap and fuse assembly to pop out. Remove the old fuse, insert a new one in its place, and then re-install the assembly. Do not overtighten.



WARNING *Always* disconnect the power cord from the power source *before* replacing a fuse, as not doing could result in electrical shock.

Calibrating the Touch Screen Display

If when touching a control, it does not respond or the cursor is misaligned with the point of contact, the touch screen display may require calibration.

To calibrate the touch screen display:

1. Select Settings from the Menu bar, and then choose UI Prefs.

The UI Preferences screen opens as shown in Figure 5-1.

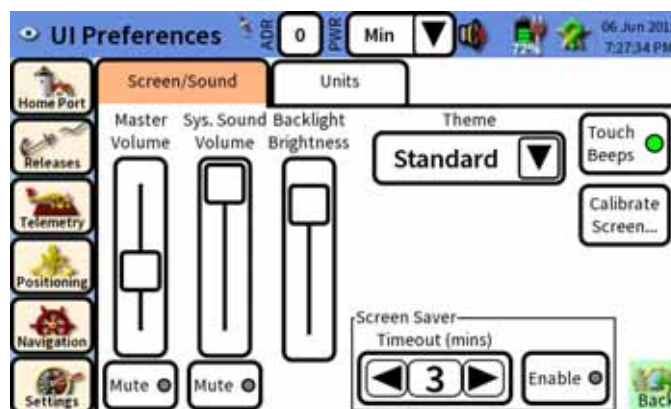


Figure 5-1 UI Preferences Screen

2. Touch Calibrate Screen.

The Confirm Calibration window opens as shown in Figure 5-2.

If any settings were changed, they will be lost after the screen calibration is complete. To save the current settings, touch Cancel, select Settings from the Menu bar, choose Save, and then repeat these two steps.

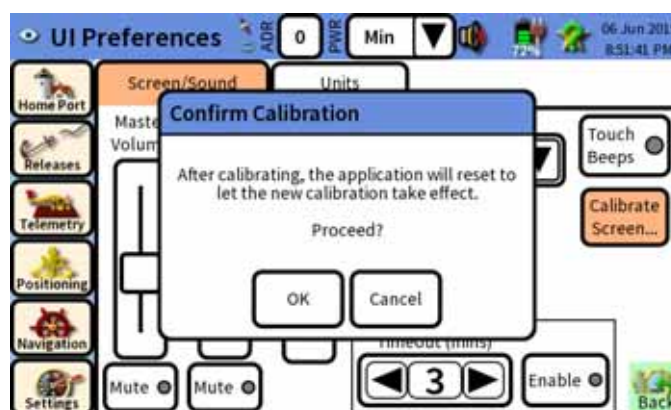
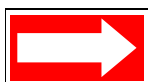


Figure 5-2 Confirm Calibration Window

3. Touch OK.
4. Follow the instructions to touch each of the displayed crosses. It is best to use a stylus or other fine, soft pointed instrument.

The topside restarts and the opening screen is displayed.



NOTE If the touch screen display is accidentally mis-calibrated to the extent that it is rendered inoperable, refer to "Recovering from a Mis-calibration of the Touch Screen Display" on page 5-4 for an alternate calibration procedure.

Recovering from a Mis-calibration of the Touch Screen Display

Should the touch screen be accidentally mis-calibrated during the calibration process, it may not be possible to access the UI Preferences screen to re-calibrate it. Should this situation occur, an alternate method of calibration can be performed.

To recover from a mis-calibration of the touch screen display:

1. Turn the topside off and then on again.
2. Wait until the "dots" at the bottom of the screen appear, and then touch anywhere in the screen and hold. Maintain light pressure on the screen until the Touch Screen Calibration window appears as shown in Figure 5-3, and then release.
3. Follow the instructions to touch each of the displayed crosses. It is best to use a stylus or other fine, soft pointed instrument.

The topside restarts and the opening screen is displayed.



Figure 5-3 Touch Screen Calibration Window

Updating the UTS-9500 Firmware

The topside firmware can be updated through the USB connector on the front panel of the topside using a USB flash drive. Teledyne Benthos periodically issues firmware updates that can be installed on a topside to upgrade the firmware. An update is in the form of a single file with a .udb extension which must be copied to the root of the flash drive. When a firmware update is installed, the currently installed firmware is moved to backup.

To update the topside firmware:

1. Copy the .udb file to the root of a USB flash drive that is formatted using the FAT32 or FAT16 file system. The root is the top level directory. The file should *not* be copied to a folder. File systems such as NTFS or exFAT will not be recognized by the system.
2. Verify that the topside battery is fully charged or an uninterruptable AC power source is connected.

3. Select Settings from the Menu bar, select System, and then choose UTS Update.

The Software Update window opens warning that the software will be updated as shown in Figure 5-4.



Figure 5-4 Software Update Window

4. Touch OK.

The Universal Topside Firmware Loader screen opens as shown in Figure 5-5.

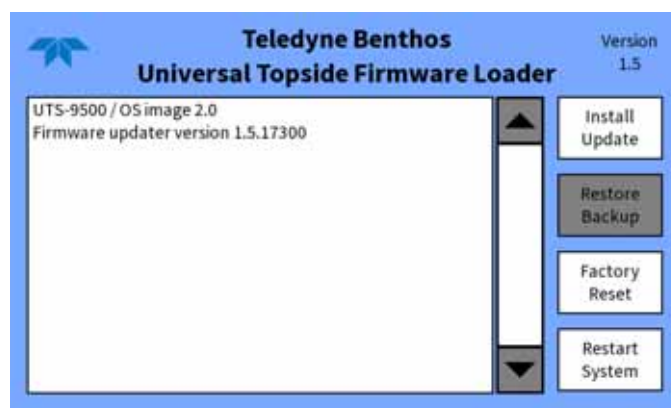


Figure 5-5 Universal Topside Firmware Loader Screen

5. Touch Install Update.

A warning window opens as shown in Figure 5-6 stating that the software will be updated and asking whether to proceed.

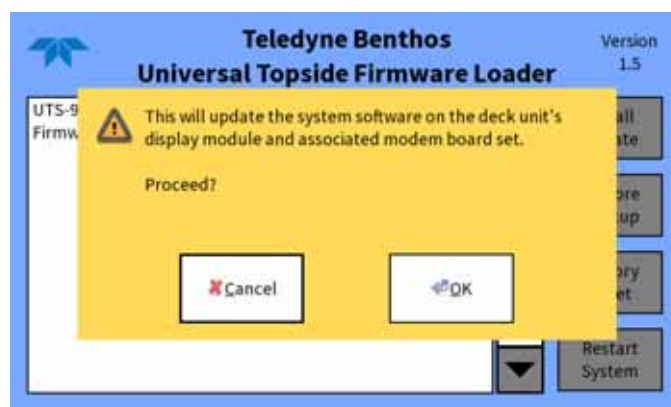


Figure 5-6 Update Warning Window

6. Touch OK.

A warning window opens as shown in Figure 5-7 with instructions to insert the USB flash drive.

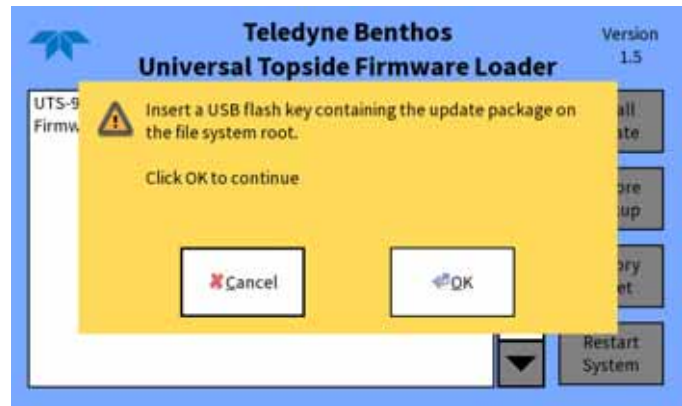


Figure 5-7 Warning Window with Instructions to Insert USB Flash Drive

7. Insert the USB flash drive, wait for several seconds for the drive to be recognized, and then touch OK.

The Select Update Package window opens as shown in Figure 5-8.

8. Select the .udb file from the drop-down list if there are more than one.

9. Touch OK.

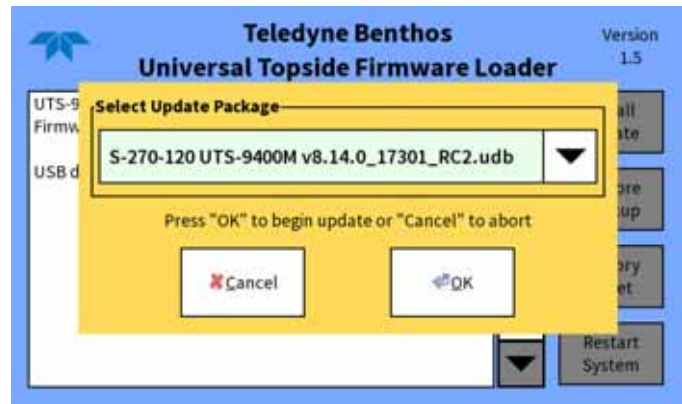


Figure 5-8 Select Update Package Window

The firmware is updated, and if updated successfully, an update successful message is displayed as shown in Figure 5-9.

10. Remove the USB flash drive.

11. Touch Restart System.

The firmware is updated which takes several minutes, the topside restarts and the opening screen is displayed.

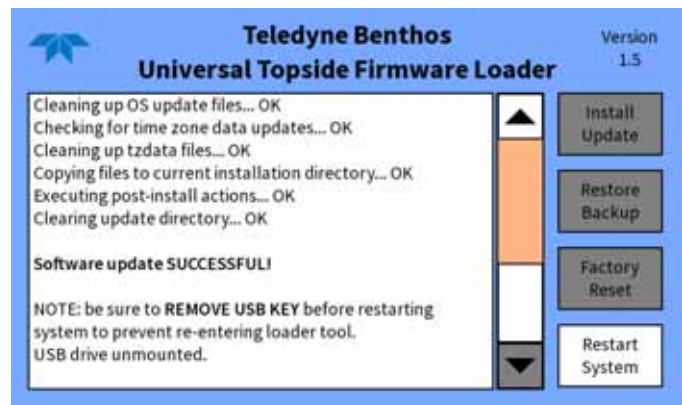


Figure 5-9 Software Update Successful Message

Factory Resetting the Topside

The topside can be factory reset. One of two types of factory resets can be performed. One is a user data reset that erases the user data, settings and log files, and the other is a full reset that erases the user data, settings, log files, *and* the currently installed firmware version.

To factory reset the topside:

1. Verify that the topside battery is fully charged or an uninterruptable AC power source is connected.
2. Select Settings from the Menu bar, select System, and then choose UTS Update.

The Software Update window opens as shown in Figure 5-10 indicating that the software will be updated.

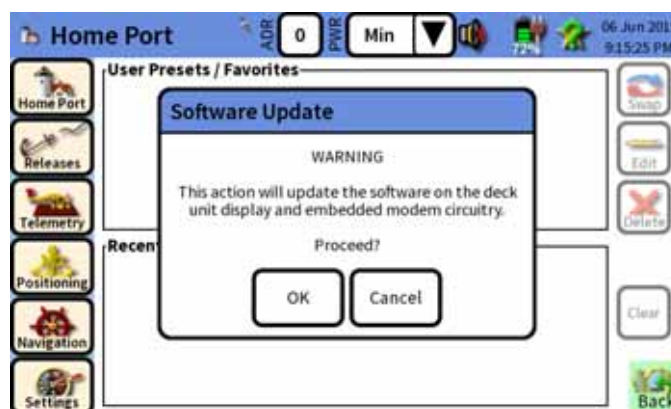


Figure 5-10 Software Update Window

3. Touch OK.
4. The Universal Topside Firmware Loader screen opens as shown in Figure 5-11.

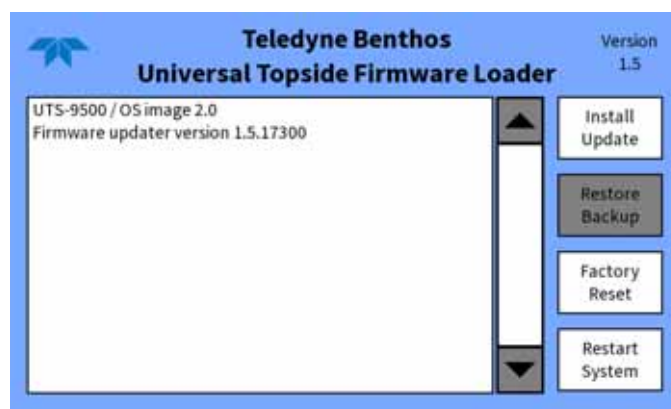


Figure 5-11 Universal Topside Firmware Loader Screen

5. Touch Factory Reset.

A window opens as shown in Figure 5-12. This window allows the choice of resetting only the user data or performing a full reset.

6. To reset the user data only, touch User Data. To perform a full reset, touch Full Reset.

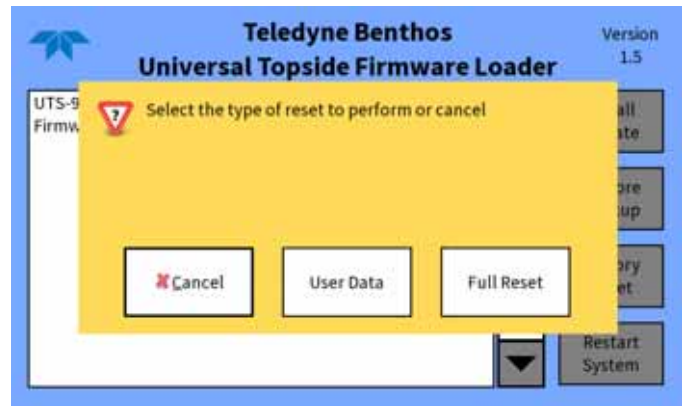


Figure 5-12 Window for Selecting Type of Reset

If User Data was selected, a warning window opens as shown in Figure 5-13 stating that all user data, settings and log files will be erased.

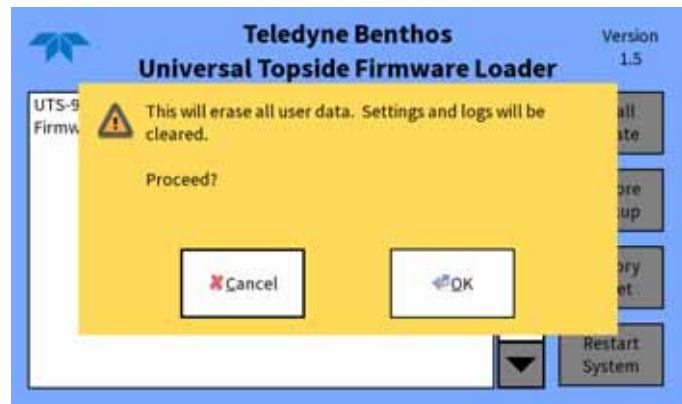


Figure 5-13 User Data Reset Warning Window

If Full Reset was selected, a warning window opens as shown in Figure 5-14 stating that all user data, settings, log files, and firmware will be erased.



Figure 5-14 Full Reset Warning Window

7. Touch OK.

For a data reset, a final warning window opens as shown in Figure 5-15 stating that all the user data are about to be cleared.



Figure 5-15 About to Clear All User Data Warning Window

For a full reset, a final warning window opens as shown in Figure 5-16 stating that all the user data and firmware are about to be cleared.



Figure 5-16 About to Clear All User Data and Firmware Warning Window

8. Touch OK.

The factory reset is performed, and if performed successfully, a reset message is displayed as shown in Figure 5-17.

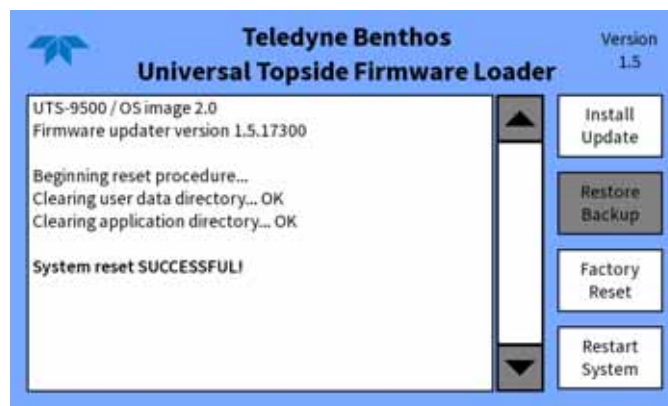


Figure 5-17 Factory Reset Successful Message

Restoring the Topside Firmware

When updating the topside firmware, the topside saves a backup copy of the existing firmware. This copy can be used to restore the firmware to that of the backup copy.

To restore the topside firmware:

1. Verify that the topside battery is fully charged or an uninterruptable AC power source is connected.
2. Select Settings from the Menu bar, select System, and then choose UTS Update.

The Software Update window opens as shown in Figure 5-18 indicating that the software will be updated.



Figure 5-18 Software Update Window

3. Touch OK.
4. The Universal Topside Firmware Loader screen opens as shown in Figure 5-19.

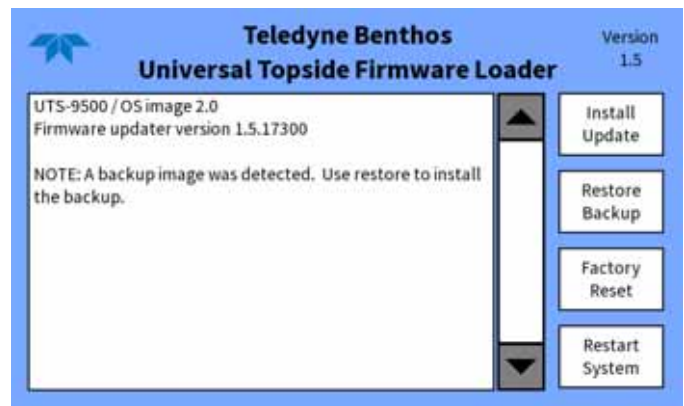


Figure 5-19 Universal Topside Firmware Loader Screen

5. Touch Restore.

A warning window opens as shown in Figure 5-20 stating that an attempt will be made to restore the software and asking whether to proceed.

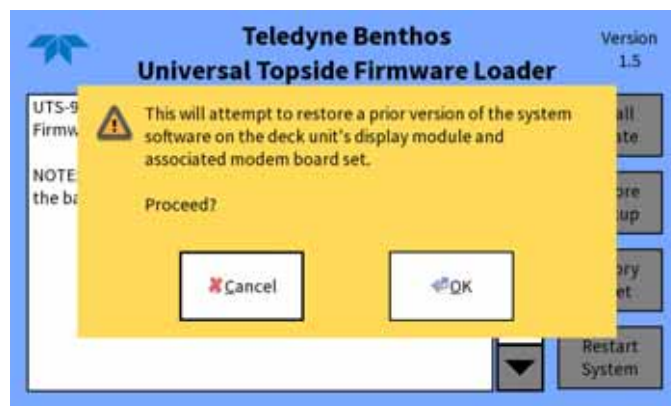


Figure 5-20 Restore Warning Window

6. Touch OK.

The Available Storage Package window opens as shown in Figure 5-21.

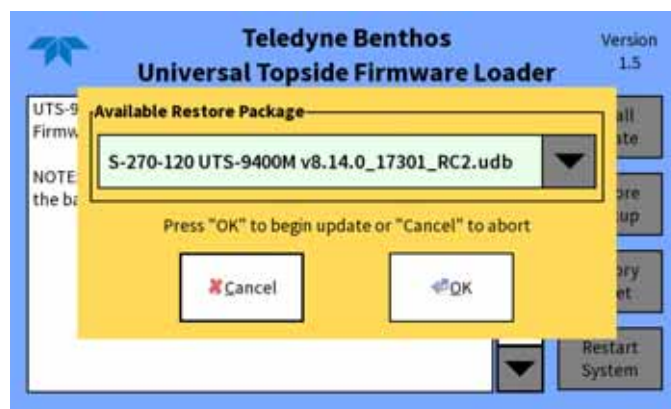


Figure 5-21 Available Restore Package Window

7. Touch OK.

The firmware is restored, and if updated successfully, a restore successful message is displayed as shown in Figure 5-22.

8. Touch Restart System.

The firmware is restored which takes several minutes, the topside restarts and the opening screen is displayed.

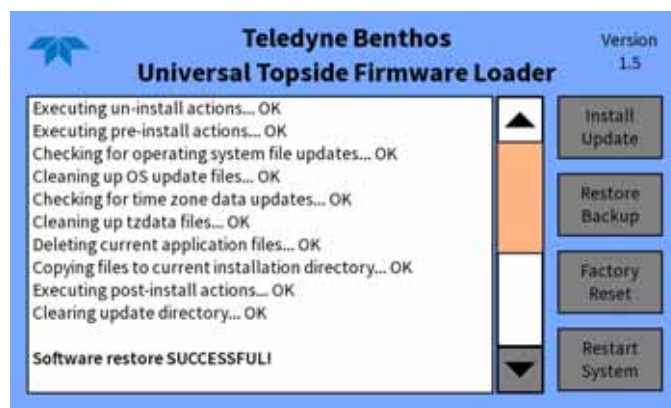


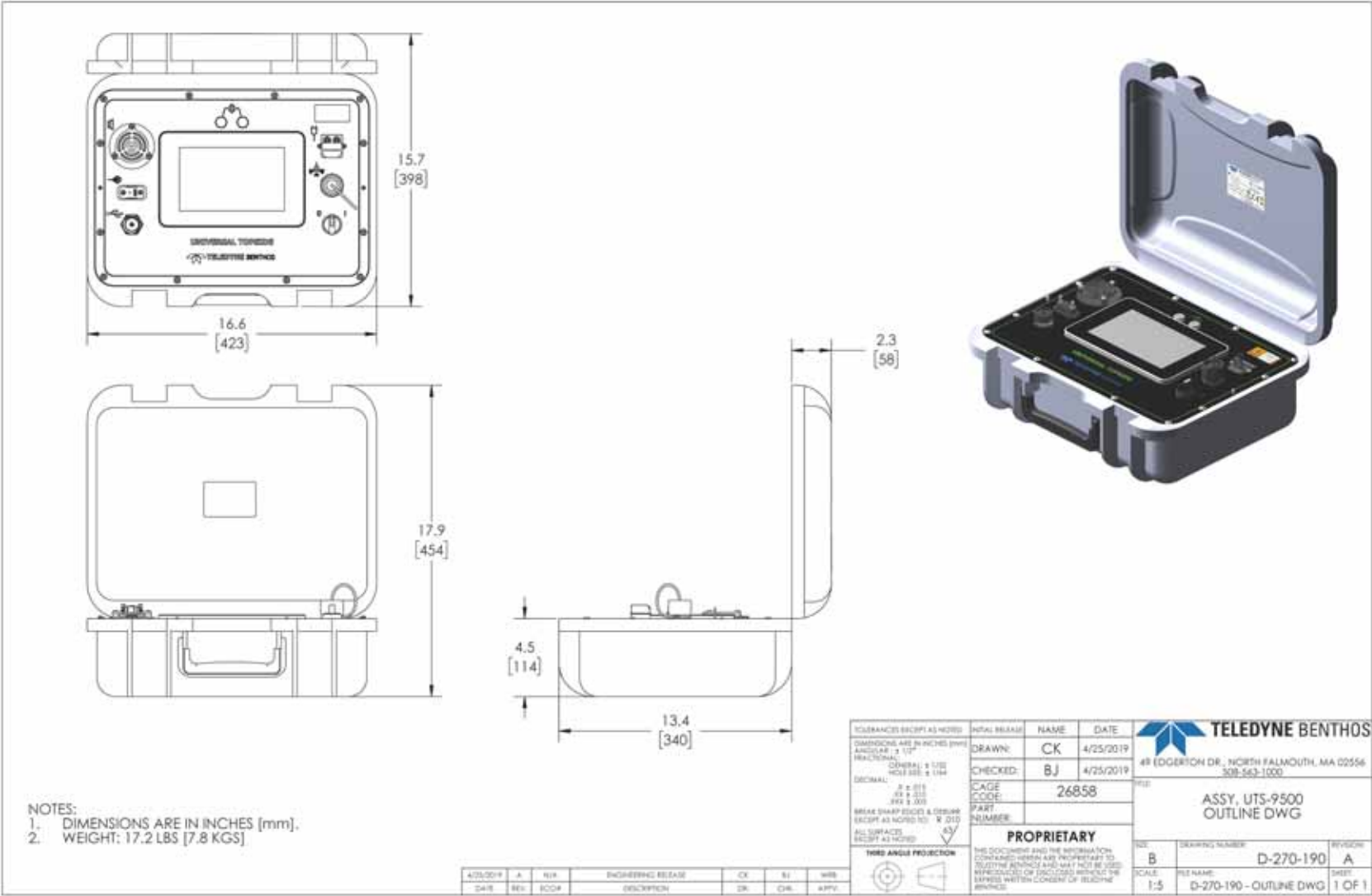
Figure 5-22 Software Restore Successful Message

6 Detailed Views

This section includes detailed assembly drawings of the UTS-9500 Universal Topside and the transducer types.

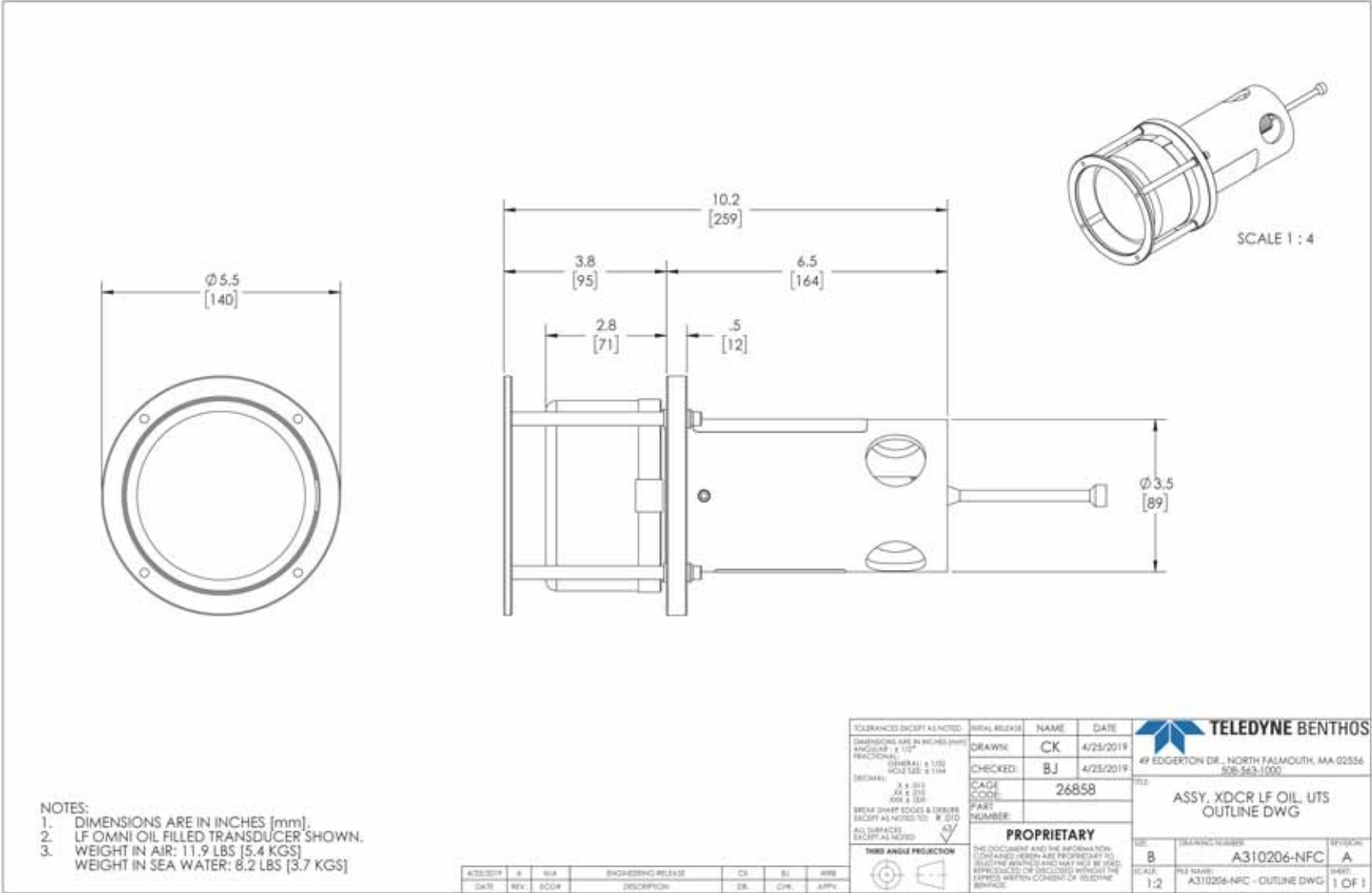
The included drawings are the following:

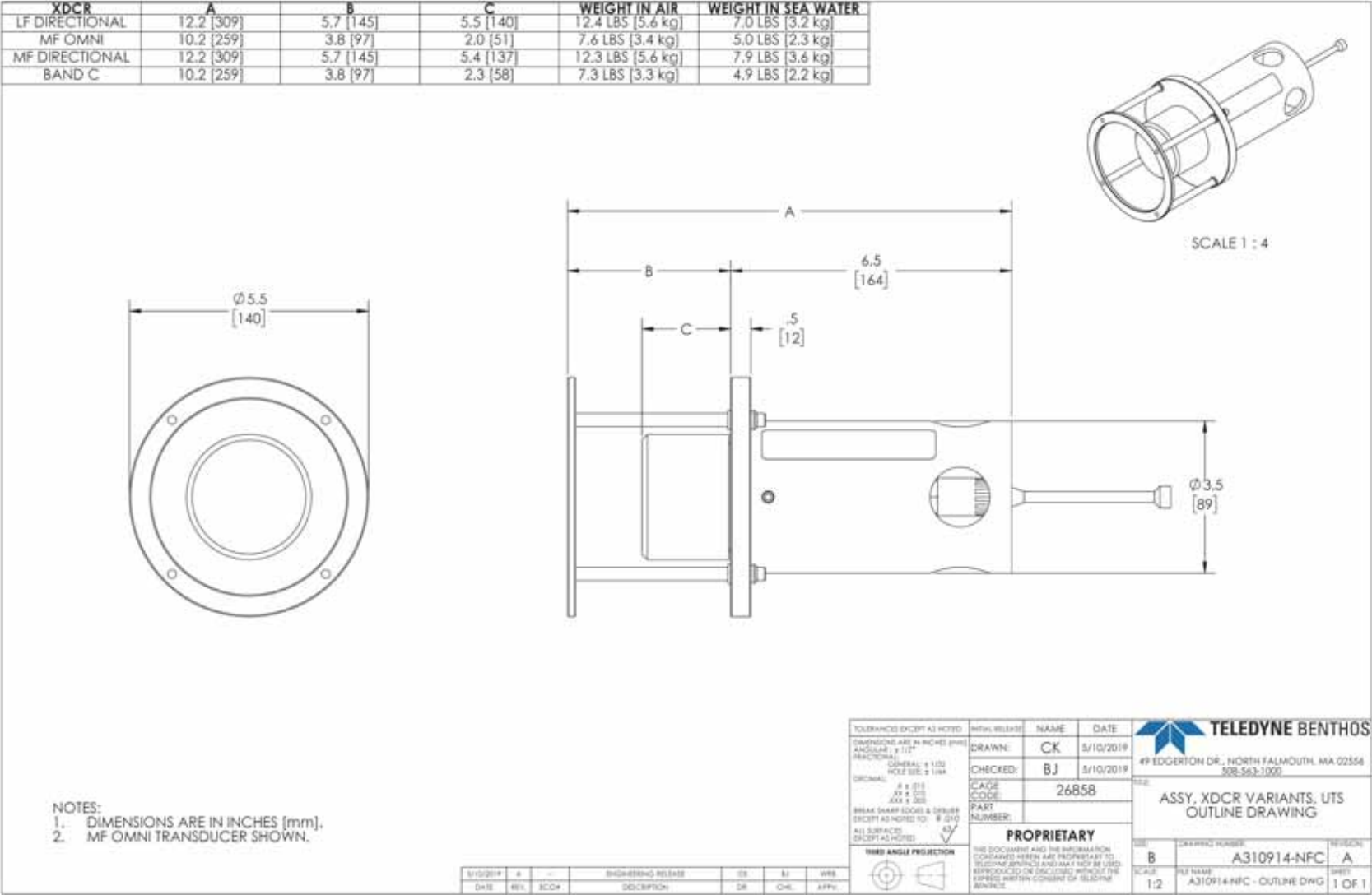
D-270-190-OUTLINE	Outline, UTS-9500
A310206-NFC-OUTLINE	Outline, UTS-9500 XDCC LF Oil Filled
A310914-NFC-OUTLINE	Outline, UTS-9500 XDCC Variants



6 Detailed Views

EAR-Controlled Technology Subject to
Restrictions Contained on the Cover Page





7 Accessories and Part Number Designator

This section includes a list of UTS-9500 Universal Topside accessories. Also included is a part number designator which provides an easy method for designating the specific part number for a UTS-9500 when placing an order.

Accessories

Shown in Table 7-1 is a list of accessories available from Teledyne Benthos for the topside. Refer to "Customer Service" on page vi for information on how to contact Teledyne Benthos to order these items.

Table 7-1 UTS-9500 Universal Topside Accessories

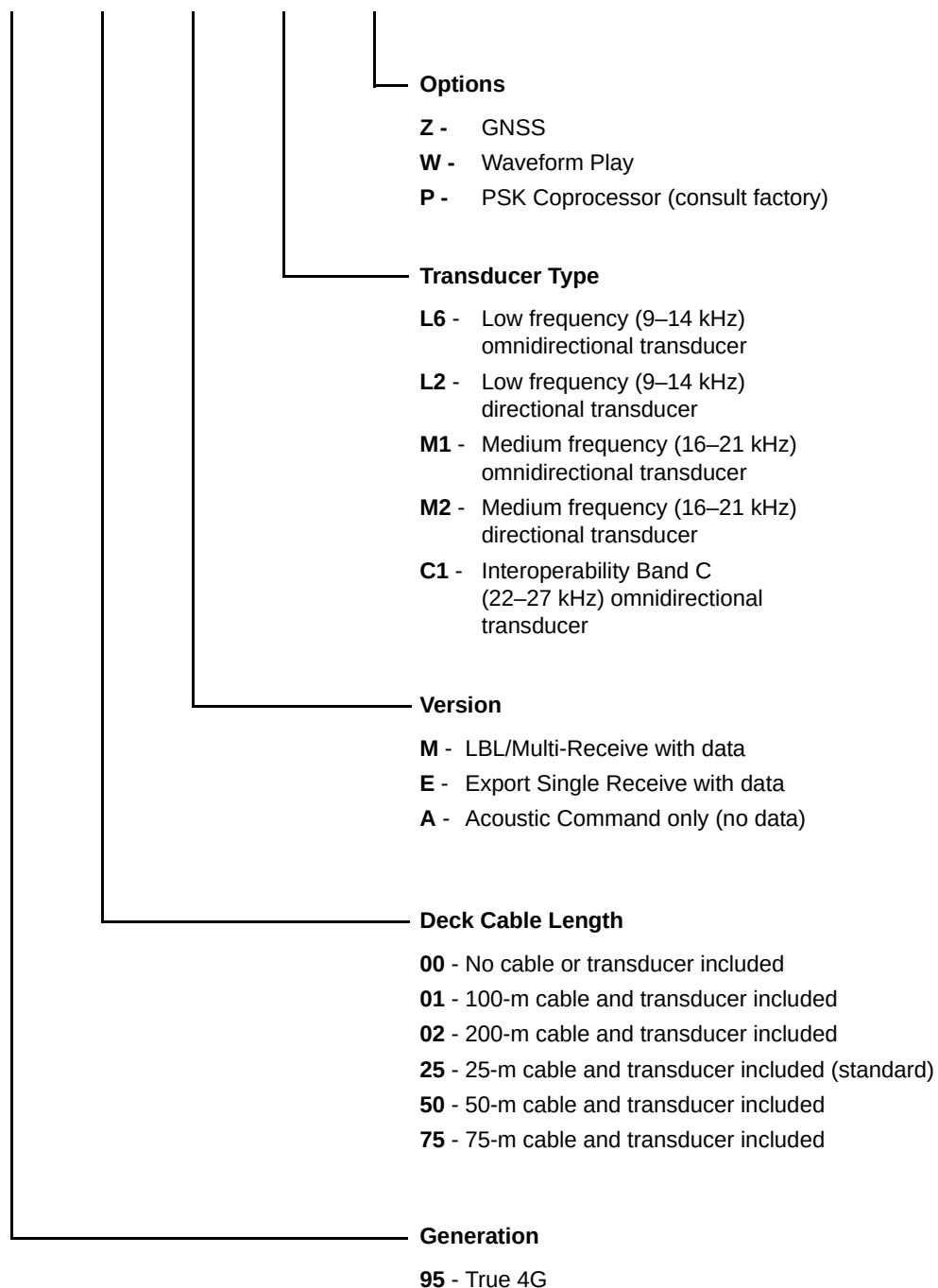
DESCRIPTION	PART NUMBER
25m UTS-9500 Series Deck Cable & Case	CBL-UTS95-25
50m UTS-9500 Series Deck Cable & Case	CBL-UTS95-50
UTS-9500 Series LF Omni Transducer Assembly*	A310206-NFC
UTS-9500 Series Band C Omni Transducer Assembly*	A310914-NFC-4

*NOTE: When ordering transducer assemblies, the frequency band must match the deck box frequency band.

Part Number Designator

The UTS-9500 Universal Topside uses an identification number scheme that allows the model number to be used as the part number. This method simplifies the ordering and support processes. To designate the part number for a topside specification, follow the legend shown in Figure 7-1 on page 7-2.

UTS - A B C - D - E



NOTE: Specification designators A through D are required, whereas specification designator E is for the option.

Figure 7-1 UTS-9500 Universal Topside Part Number Designator Legend

8 Safety

This section provides separate lists of all of the specific warnings and cautions appearing in this manual in the order of appearance.

Warnings

The specific warnings appearing in this manual identify a potential hazard that could result in injury or death. These warnings are each preceded with the symbol



and are the following:

- ***Always* connect the power cord to the topside *before* connecting it to the power source, whether it is for operating the topside or charging its battery. Not connecting the power cord in this manner could result in an electrical shock.**
(Page 2-3)
- ***Always* disconnect the power cord from the power source *before* disconnecting it from the topside. Not disconnecting the power cord in this manner could result in an electrical shock.**
(Page 2-3)
- **Only a properly rated, grounded AC outlet should be used along with the proper AC power cord when connecting the topside to AC power, as doing otherwise could result in an electrical shock.**
(Page 3-2)
- ***Always* connect the power cord to the topside *before* connecting it to the power source. Not connecting the power cord in this manner could result in electrical shock.**
(Page 3-2)
- **If when turning on the topside as described in "Activating the Touch Screen Display" on page 4-1, it does not operate as described in this manual, turn off the topside and then disconnect it from power.**
(Page 3-4)

- ***Always* disconnect the power cord from the power source *before* replacing a fuse, as not doing could result in electrical shock.**
(Page 5-2)

Cautions

The specific cautions appearing in this manual identify a potential hazard that could result in damage to equipment or loss of data. These cautions are preceded with the symbol



and are the following:

- **When the COM1 connection is configured as an RS-422 serial interface, the topside display features are disabled and cannot be used. The RS-422 serial interface is available on the COM1 connector only.**
(Page 3-4)
- **When disconnecting the topside, do not pack any cables inside the topside case, as doing so may damage the touch screen display.**
(Page 3-4)
- **The connection at the USB connector is only IP65 rated when the optional GNSS extender cable is used.**
(Page 3-5)
- **Changing the serial protocol will render the touch screen display of the topside inoperable. Should this situation occur, turn the topside off and then on again to return the display to normal operation.**
(Page 4-23)
- **Before proceeding with the next step, verify that the release code is correct.**
(Page 4-55)
- **Before proceeding with the next step, verify that the release code is correct.**
(Page 4-57)
- **Before proceeding with the next step, verify that the command code is correct.**
(Page 4-59)

- Before proceeding with the next step, verify that the release code is correct.
(Page 4-61)
- Before proceeding with the next step, verify that the release code is correct.
(Page 4-62)
- Before proceeding with the next step, verify that the address is correct.
(Page 4-64)
- Be especially careful not to get any lubricant on the face of the transducer as doing so will severely degrade its performance.
(Page 5-1)

A Declaration of Conformity

This section includes the EC Declaration of Conformity from Teledyne Benthos.



**TELEDYNE
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Everywhere you look™

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www.benthos.com

EC Declaration of Conformity

Company: **Teledyne Benthos
49 Edgerton Drive
North Falmouth, MA 02556 USA**

Declares that,

Model: **UTS-9500**

Description: **Universal Top Side Deck Box**

has been designed and constructed to fulfill all the relevant provisions of the 2006/42/EU Machinery Directive, 2014/30/EU Electromagnetic Compatibility (EMC) Directive, 2014/35/EU Low Voltage Directive (LVD), and 2011/65/EU as amended by (EU) 2015/863 Restriction of Hazardous Substances Directive (RoHS 3).

Applicable harmonized
standards:

**Annex 1
EN ISO 12100:2010
EN 61000-6-2: 2005
EN 61000-6-4: 2007/A1:2011
EN 60204-1:2006/A1:2009
EN 50581:2012**