

ORCA RX-103 IS A  
OVERBOARD  
RECOVERY  
COMMUNICATIONS  
APPARATUS  
RECEIVER



## *ORCA RX-103 Owner's Manual*



BriarTek, Inc. Technical Support:  
703.548.7892

Email: [support@briartek.com](mailto:support@briartek.com)

Web: [www.briartek.com](http://www.briartek.com)

## Introduction

ORCA® (Overboard Recovery Communications Apparatus) is a personal water-activated man overboard (MOB) alarm system developed by BriarTek Incorporated and utilized by the US Navy, US Army and other mariners. The alarm system includes a transmitter, receiver and direction finder. The receiver is a single channel VHF (121.5 MHz) receiver with an embedded microprocessor, GPS and touchscreen LCD interface. The RX-103 is designed to receive a signal from any ORCA® transmitter. When an ORCA® transmitter is activated, the transmitter emits a radio frequency (RF) signal. A visual and audible (95 dB) alarm on the receiver sounds upon receipt of this signal indicating the identity of the MOB as well as GPS coordinates and time (GMT) of the MOB event.

### Parts Overview (figure 1)

- A - Liquid Crystal Display (LCD)
- B - Piezoelectric Buzzer
- C - Power Connector
- D - RX Antenna Jack
- E - GPS Antenna Jack
- F - Power On/Off
- G - Helical Antenna
- H - GPS Antenna

### Operating Instructions

#### Activation:

When a transmitter from your own vessel is activated, an alarm signal (continuous warble) is activated at the receiver buzzer (B). The LCD will display the beacon ID#, name and title of the MOB (if programmed into the receiver), the vessel name and the elapsed time.

When a transmitter from another vessel is activated and within range, an alarm signal (chirp) is activated at the receiver buzzer and the beacon ID is displayed on the LCD.

When an alarm signal is received, whether own vessel or other, the display will indicate the transmitter's battery strength, either "OK" or "Low."

Received Signal Strength Indication (RSSI): RSSI is displayed on the LCD. RSSI is a measure of the field strength (radio waves at 121.5 MHz) at the antenna input.

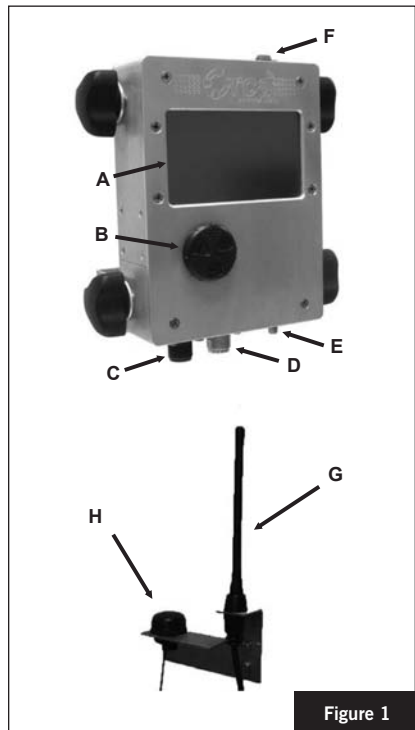


Figure 1

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**NOTE:** RSSI is not a measure of beacon signal strength. This indicator is useful for several reasons: It can help determine if a non-ORCA® signal is interfering with the operation of the ORCA® system. It can help to diagnose problems with the ORCA® equipment, such as broken antenna cables.

**NOTE:** RSSI is expressed in negative numbers, -141 dBm being the weakest and -10 dBm being the strongest signal. Typically if no systems are interfering with the ORCA® system and there are no beacons turned on, the background signal strength level will be between -130 and -110 dBm. If the background RSSI is stronger than -90 dBm (-10 dBm > RSSI > -90 dBm), then the ORCA® beacon will not be able to be received except in very close proximity to the vessel.

**Audible Alarm:** When the receiver detects the FM signal emitted by the transmitter, the buzzer (B) emits a 100 dB audible alarm. The audible alarm will continue to sound until either the transmitter is turned OFF, sending an “All Clear” signal to the receiver; or the “Silence Alarm” button on the LCD touchscreen is selected.

**NOTE:** The silence button only appears on the LCD when an own vessel beacon is activated.

## LCD Touchscreen Interface Components

### ORCA® Signal Detection

If no ORCA® signal is detected by the receiver, the word “Scanning...” will appear in the center of the home screen. Additional information including the date, time, signal strength and GPS indication will appear in the upper right hand corner. The “Settings” and “Night Mode” buttons are located along the bottom of the home screen. See figure 2.

**Non-Own Vessel Beacon Detection (Ship ID is in database):** When an ORCA® beacon that is programmed to another vessel is activated and within range, and the vessel identity is programmed into the receiver database, the buzzer will chirp and the ship ID, beacon ID and battery condition will appear in the lower left hand corner of the home screen. See figure 3.

If the vessel identity is not programmed into the receiver database, the ship ID will indicate “???”. See figure 4.

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Figure 2

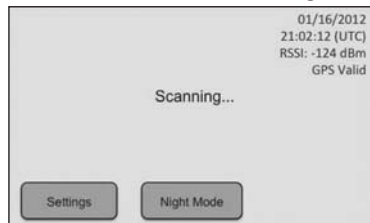


Figure 3

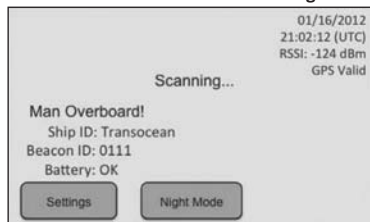
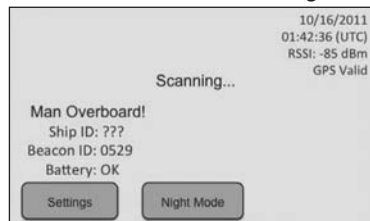
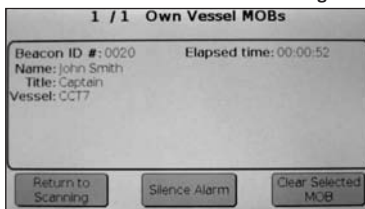


Figure 4



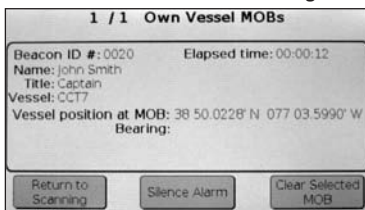
Own Vessel Beacon Detection: When an ORCA® beacon that is programmed to your own vessel is activated and within range, the buzzer will activate with a warble tone and the LCD will display the beacon ID, name and title of the MOB (if programmed), the vessel ID and the elapsed time. See figure 5.

Figure 5



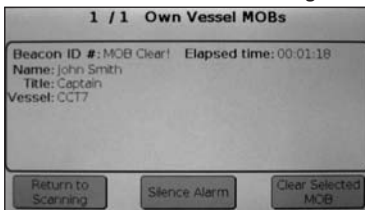
If GPS antenna is installed and connected, the vessel's position at the time of the MOB event will be displayed. See figure 6.

Figure 6



To silence the alarm without canceling the alarm, press the "Silence Alarm" button on the LCD. To cancel the alarm, press the "Clear Selected MOB" button on the LCD. This function is provided to allow the user the ability to remove the ID information from the receiver's memory in the event it did not receive the "All Clear" from a transmitter. See figure 7.

Figure 7



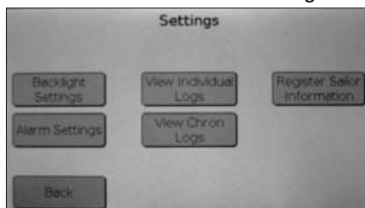
**NOTE:** If the transmitter has not been deactivated, the receiver will continue to alarm after pressing the "Clear Selected MOB" button. To return to the home screen press the "Return to Scanning" button.

## Settings

To access the Settings screen (see figure 8), press the Settings button on the home screen. The Settings screen allows the user to:

1. Adjust backlight level. (Backlight Settings)
2. Adjust alarm volume. (Alarm Settings)
3. Search the receiver's database for a specific transmitter activation. (View Individual Logs)
4. View all transmitter activations in the receiver's database. (View Chron Logs)
5. Enter/edit a person's name in the receiver's database. (Register Sailor Information)

Figure 8



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## Backlight Settings

To adjust the receiver display's brightness, press the Backlight Settings button on the Settings screen and the Backlight Settings screen will appear. See figure 9. Press and slide the Daytime Backlight Level indicator or the Night Backlight Level indicator to the desired level (right to increase, left to decrease). Once the desired adjustment has been made, press the "Apply" button and the display will return to the Settings screen.

Figure 9

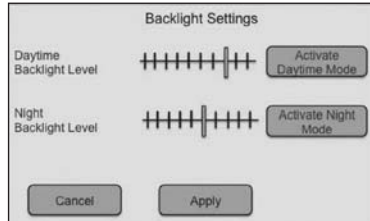


Figure 10

## Alarm Settings

To adjust the receiver's volume when alarming, press the Alarm Settings button on the Settings screen and the Alarm Settings screen will appear. See figure 10. Press and slide the indicator to the desired level (right to increase, left to decrease). To hear the volume level, press the Test Volume button. Once the desired adjustment has been made, press the "Apply" button and the display will return to the Settings screen.

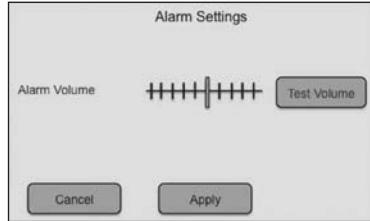


Figure 11

## View Individual Logs

To search the receiver's database for a specific own vessel transmitter activation, press the View Individual Logs button on the Settings screen and a beacon ID entry screen will appear. See figure 11. Enter the last 4 digits of the beacon ID and press OK. The Log data for Beacon ID#XXXX screen will display the Date, Time, Event (MOB, Clear MOB) and battery status of all transmissions the desired beacon has made. See figure 12. Select the Details button to display name, rank and GPS data associated with the selected event. See figure 13. To return to the Settings screen, press Done.



Figure 12



Figure 13



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## View Chronological Logs

To display a chronological list of all beacon transmissions, press the View Chron Logs button on the Settings screen and the Chronological Log Data screen will appear. See figure 14. This screen will display the Date, Time, Event (MOB or Clear MOB) and Beacon ID of each beacon transmission beginning with most recent. Select the Details button to display name, rank/title, hull # to which the individual is assigned and GPS data associated with the selected event. See figure 15. To return to the Settings screen, press Done.

## Register Sailor Information

To enter, edit or remove a person's name in the receiver's database, press the Register Sailor Information button on the Settings screen and a beacon ID entry screen will appear. See figure 11. Enter the last 4 digits of the beacon ID to be registered, edited or deleted and press OK. The Stored info for Beacon ID #XXXX screen will appear next. See figure 16.

If the beacon has not already been registered, no information will be displayed on the Name and/or Title fields. To enter name and title information, proceed as follows:

- **Press the Set Name button:** the Enter name for beacon ID #XXXX screen will appear. See figure 17. Enter the person's name as you would like is displayed using the touchscreen keyboard. To enter symbols, press the SY key. Once completed, press the Enter key.
- **Press the Set Title button:** the Enter title for beacon ID #XXXX screen will appear. See figure 18. Enter the person's title as you would like it displayed using the touchscreen keypad. To enter symbols, press the SY key. Once completed, press the Enter key.

Figure 14

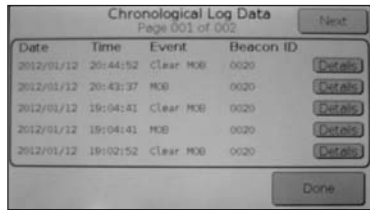


Figure 15



Figure 16

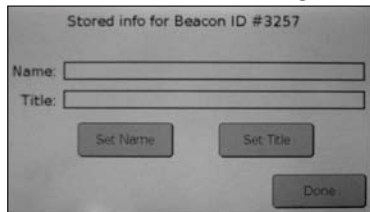


Figure 17

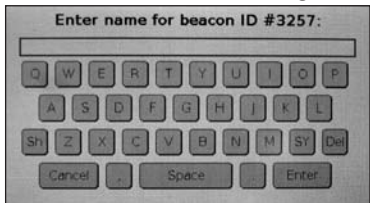
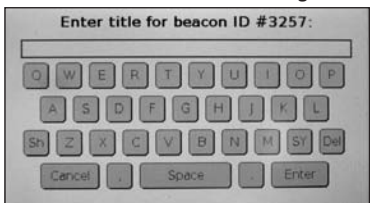


Figure 18



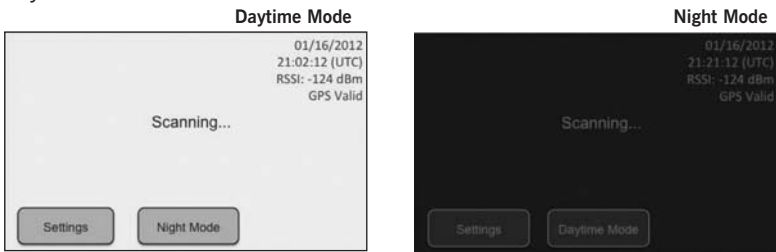
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If the beacon has already been registered, the Name and Title will be filled in. To edit or delete name and title information from the database, proceed as follows:

- **Press the Set Name button:** the Enter name for beacon ID #XXXX screen will appear. Edit or delete the person's name using the touchscreen keypad. Once completed, press the Enter key.
- **Press the Set Title button:** the Enter title for beacon ID #XXXX screen will appear. Edit or delete the person's title using the touchscreen keypad. Once completed, press the Enter key.

### Night Mode

During darken ship, press the “Night Mode” button on the Home screen to toggle the screen display from Daytime Mode to Night Mode. To return to Daytime Mode, press the Daytime Mode button.



### Installation Notes

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The installation notes provided herein are intended to serve as a guide only. They do not serve as material required for the certification of technicians for the installation, repair or alteration of the ORCA® system.

#### Receiver:

- **General:** The RX-103 is typically installed in the pilothouse and should be mounted in a location so that the audible alarm is easily heard and the touchscreen control buttons are easily accessible and readable by watch standers.
- **Mounting The Receiver:** The receiver should be mounted to a fiddleboard or part of the super structure such as a bulkhead. Mount the receiver brackets using appropriate fasteners (self-tapping screws or 1/4 x 20 machine screws with locknuts/washers). The receiver brackets are designed with slots to allow for flexibility in mounting the receiver. See section 7.0 Receiver Mounting for dimensions. Once the brackets are securely mounted, secure the receiver to the brackets by inserting the threaded mounts (4) into each of the bracket side slots (2 each x 2 brackets). Finally, adjust the angle of the receiver by tilting forward or back as desired and thread the knobs (4) onto each of the threaded mounts until snug.

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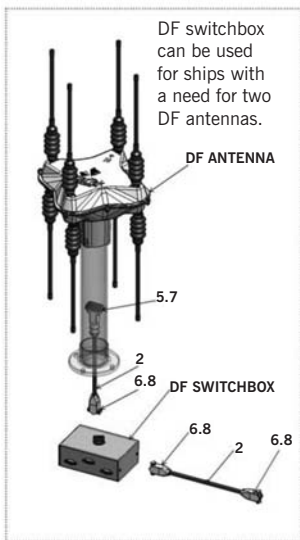
- **Power Connection:** Twelve or twenty four volts DC is required to provide power to the system. An optional battery backup will supply power to the receiver for 1 hour in the event power to the circuit is lost.

**Receiver Antenna:**

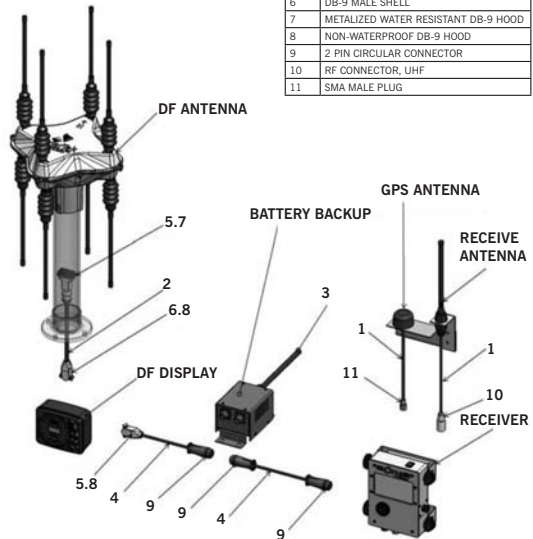
- **General:** The receiver antenna should be located in an elevated location (above the pilothouse or vessel’s mast) to ensure that the ORCA® signal is received. The higher the antenna is mounted, the better range can be expected. In addition, to avoid signal loss caused by excessive cable length, the coaxial cable length between the RX 103 receiver and antenna should not exceed 150 feet.

- **Mounting The Receiver And GPS Antennas:** The receiver antenna is over molded to a 90° stainless steel bracket and coaxial cable. The GPS antenna is bolted to a 90° stainless steel bracket. Each bracket has 2 holes which are used for securing to a foundation (see sections 8.0 Receiver Antenna and 9.0 GPS Antenna for hole dimensions). The foundation should be metal similar to the superstructure/mast being welded or bolted to. For cable assembly and installation instructions, follow the guidance provided in the Receiver Antenna/Cable Install Guide located on the BriarTek website.

**ORCA® System Installed Components**



ITEM	DESCRIPTION
1	COAX CABLE
2	SERIAL CABLE
3	POWER CABLE, 3 CONDUCTOR
4	POWER CABLE, 2 CONDUCTOR
5	DB-9 FEMALE SHELL
6	DB-9 MALE SHELL
7	METALIZED WATER RESISTANT DB-9 HOOD
8	NON-WATERPROOF DB-9 HOOD
9	2 PIN CIRCULAR CONNECTOR
10	RF CONNECTOR, UHF
11	SMA MALE PLUG



## Parts List

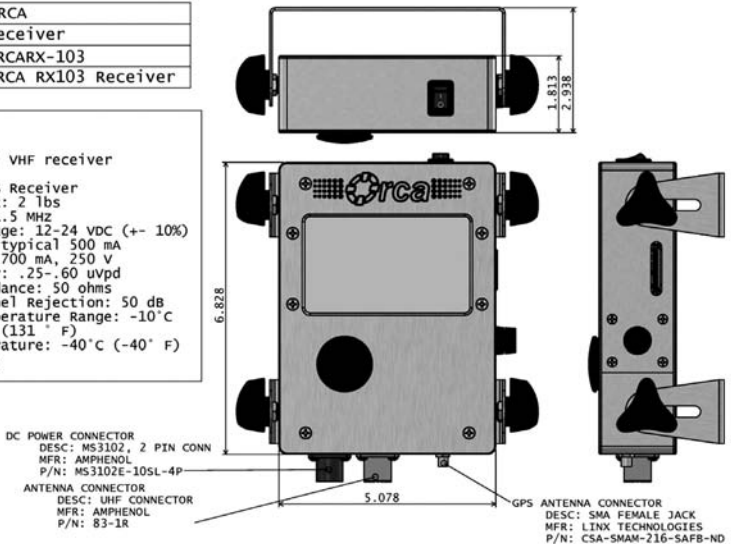
System	Subsystem	Part Number	Component Description (Nameplate Data)	Mfr
ORCA®	Receiver	ORCARX-103	<b>Receiver:</b> 95 dB audible alarm; touchscreen LCD; hardened enclosure; mounting bracket; 121.5 MHz; power requirement: 12-24 VDC	BriarTek
ORCA®	Receiver	ORCARXAKHLX102	<b>Receive antenna repair kit:</b> Over molded helical antenna with mounting bracket and 10' of FSJ1 coaxial cable; fasteners, SMA connectors (2) and heat shrink.	BriarTek
ORCA®	Receiver	ORCARXGA102A	<b>GPS antenna repair kit:</b> Screw-mounted GPS antenna with 10' coaxial cable and mounting bracket, SMA connectors, heat shrink and fasteners	BriarTek

## Specifications

System	ORCA
Sub System	Receiver
Part Number	ORCARX-103
Description	ORCA RX103 Receiver

### SPECS:

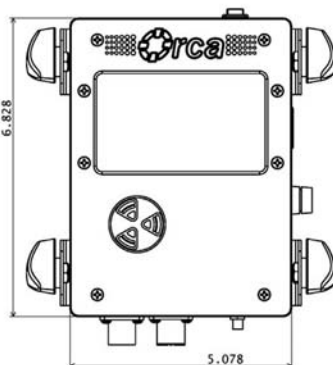
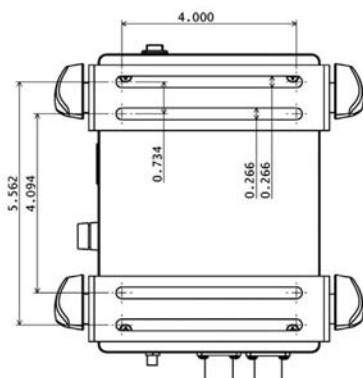
- Single Channel VHF receiver
- Touch Screen
- Integrated GPS Receiver
- Overall weight: 2 lbs
- Frequency: 121.5 MHz
- Operating voltage: 12-24 VDC (+/- 10%)
- Current Draw: typical 500 mA
- In line fuse: 700 mA, 250 V
- RF Sensitivity: .25-.60 uvpd
- RF Input Impedance: 50 ohms
- Adjacent Channel Rejection: 50 dB
- Operating Temperature Range: -10°C (14 °F) +55°C (131 °F)
- Storage Temperature: -40°C (-40° F) +60° C (140° F)



## Receiver Mounting

System	ORCA
Sub System	Receiver
Part Number	ORCARX-103
Description	ORCA RX103 Receiver

### ORCA-RX103 Mounting Specifications



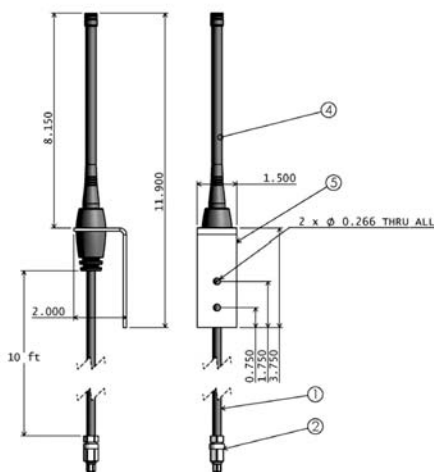
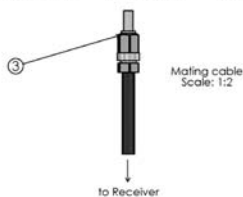
## Receiver Antenna

System	ORCA
Sub System	Receiver
Part Number	ORCARX-AKHLX102
Description	Receiver Antenna, bracket and cable

### SPECS:

- Application: ship mounted receive antenna
- Operating Frequency: 121.5 MHz
- Weights:
  - Antenna Element: 47 g
  - Bracket: 132 g
  - Overmold material: 37 g

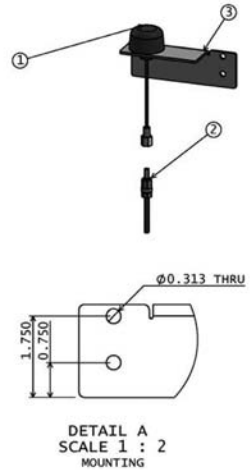
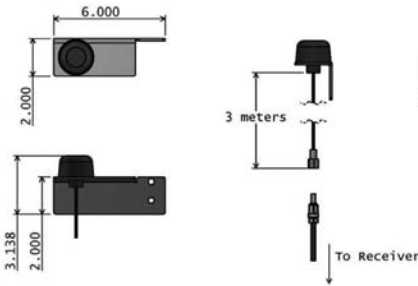
Item Qty	Desc	MFG	MFG P/N
1	1 Helix Cable, 1/4"	Andrew	PS3XXX
2	1 SMA Male Plug Connector	Andrew	F1TSM-c
3	1 SMA Female Jack Connector	Andrew	F1TSP-BH
4	1 121.5 Mhz helical antenna	Laird Technologies	EXB-118-BW
5	1 RX102 Antenna Bracket	BriarTech, Inc.	ORCARX-A102-BRACKET



# GPS Antenna

System	ORCA
Sub System	Receiver
Part Number	ORCARX-GA102A
Description	ORCA GPS Antenna and cable

Item	Qty	Description	MFG	MFG P/N
1	1	GPS Antenna with 3m coax cable with male SMA plug connector	Taoglas Limited	A.01.C.301111
2	1	SMA female jack connector	Andrew	FITSF-BH
3	1	ORCA GPS Antenna Bracket	BriarTek, Inc.	ORCARX-GA102A-BRACKET



## Warranty

BriarTek provides a one-year warranty on all ORCA® man overboard alarm system effective from the date of purchase.

If a component fails to function properly during its warranty period (one year), the manufacturer will proceed according to its warranty as follows:

- » BriarTek Inc. guarantees each product it distributes to be free from defective materials and workmanship and agrees to remedy any such defect or to furnish a new or equal part in exchange (at its option) for a period of one year from the date the component is purchased.
- » For an exchange of the product, please contact BriarTek at 703.548.7892 or on the web at [www.briartek.com](http://www.briartek.com), and a customer service representative will provide the necessary instructions. Original receipt is required for all exchanges.

### This warranty is void if:

- » any component has been subject to misuse or improper installation by a non-BriarTek employee or has been repaired or altered by a non-BriarTek employee.
- » any component fails to function properly after being put into service due to something other than defective materials or workmanship, i.e. excessive temperature, humidity, or shock while component is in storage.





[www.briartek.com](http://www.briartek.com)

San Diego, California | Alexandria, Virginia | Indianapolis, Indiana  
Technical Support: 703.548.7892