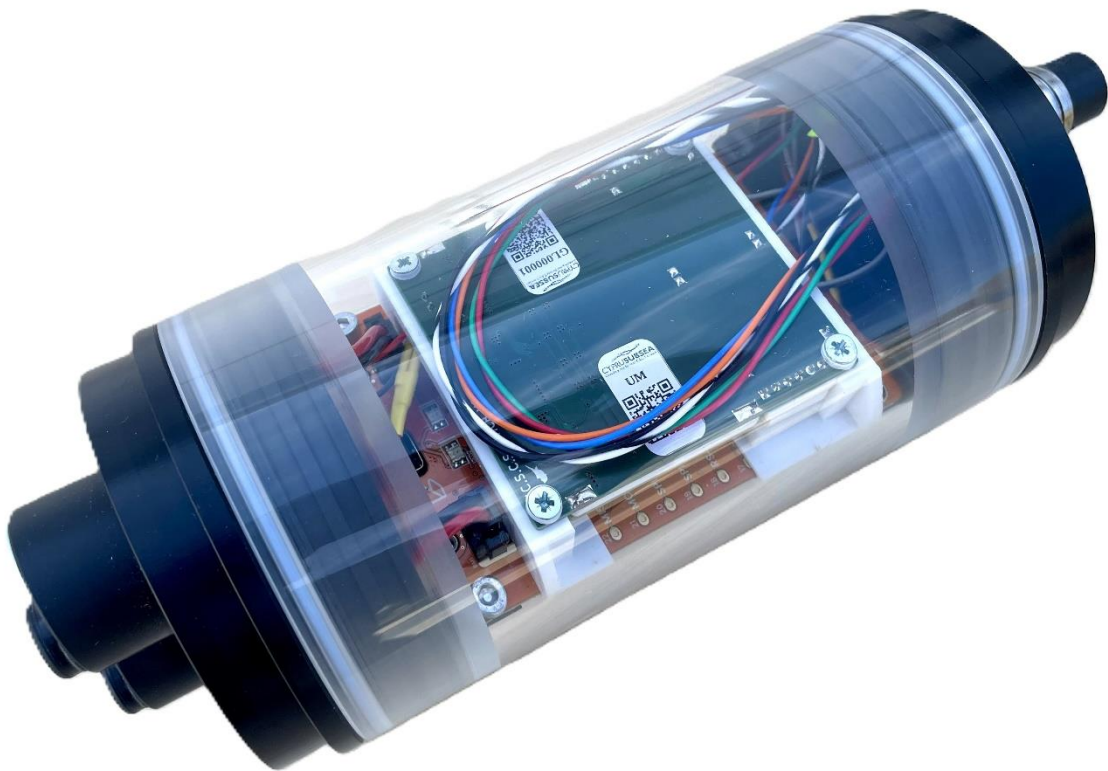
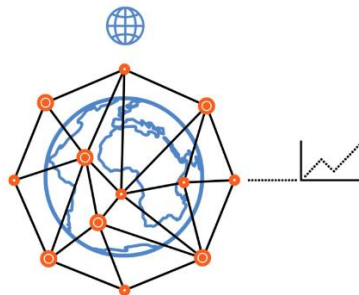


gListen Board integrated with an Ocean Sonics icListen HF Smart Hydrophone & Bristlemouth Development Kit

User Manual



Smart hydrophone & data integration made easy.



September 2024
Version 1.00



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gListen Board with Ocean Sonics icListen HF

User Manual

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Document Revisions

Date	Version Number	Document Changes
26 September 2024	1.00	Initial draft

Approvals

Name	Title
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1. PREFACE

1.1 Description of the User

The gListen Board is an Ethernet to RS-232 converter with voltage regulation and onboard memory for reading and extracting data. In particular, the gListen Board was initially developed to conduct Passive Acoustic Monitoring (PAM) with ocean gliders. It is an innovative marine autonomous system (MAS) accessory that is compatible with Ocean Sonics icListen digital hydrophones.

Paired with an OceanSonics icListen digital hydrophone, the gListen Board keeps track of events detected by the hydrophone and relays this data. The board facilitates near real-time event detection and spectrum retrieval. User-configured frequency spectra can also be transmitted.

It is an intelligent peripheral for the marine sensor market that benefits the environmental monitoring service value chain. This product reduces development and operational costs for a number of stakeholders – from marine platform and hydrophone manufacturers to end users for various applications.

End users of the gListen Board are maritime and port security stakeholders, offshore oil, gas and wind operators, academic researchers and government organizations that need to gather information offshore but do not have the resources available for bespoke engineering.

These end users will not need any particular training, certification or expertise to use this product. The user is required to review the present User Manual to use the gListen Board.

1.2 Conventions Used in This Manual

The following style conventions are used in this document:

Bold

- Names of product elements, commands, options, programs, processes, services, & utilities
- Names of interface elements (such as windows, dialog boxes, buttons, fields, & menus)
- Interface elements the user selects, clicks, presses, or types

Italic

- Publication titles referenced in text
- Emphasis (for example a new term)
- Variables

`Courier`




- System output, such as an error message or script
- URLs, complete paths, filenames, prompts, and syntax

User input variables

- < > Angle brackets surround user-supplied values
- [] Square brackets surround optional items
- | Vertical bar indicates alternate selections - the bar means “or”

1.3 Graphical Symbols

Table 1: Graphical Symbols included within User Manual

Symbol	Meaning
	GitHub logo. GitHub is a website for developers and programmers to collaboratively work on code. The primary benefit of GitHub is its version control system, which allows for seamless collaboration without compromising the integrity of the original project. The projects on GitHub are examples of open-source software.
	Open Source Hardware logo. The Open Source Hardware (OSHW) Definition 1.0 defines hardware as "tangible artifacts — machines, devices, or other physical things." The term hardware is open-source hardware has been historically used in opposition to the term software.
	The symbol indicating separate collection for electrical and electronic equipment (EEE) consists of the crossed-out wheeled bin.

1.4 Explanation of Safety Warnings & Advisory Notice

DANGER!

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING!

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION!

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE!

Notice provides information and/or advise on what action should or should not be taken in the use, disposal or return of the cable assembly.

1.5 Obtaining Documentation and Information

Latest Version

The latest version of the documentation is available upon request.

Documentation Feedback

If you are this reading Cyprus Subsea Consulting and Services Ltd product documentation, any comments can be sent to info@cyprus-subsea.com.

We appreciate your comments!

2. DESCRIPTION OF gListen Board

2.1 Purpose of gListen Board

The gListen Board is a programmable system integrated with a smart hydrophone to intelligently connect an Ocean Sonics icListen smart hydrophone with various oceanographic platforms.

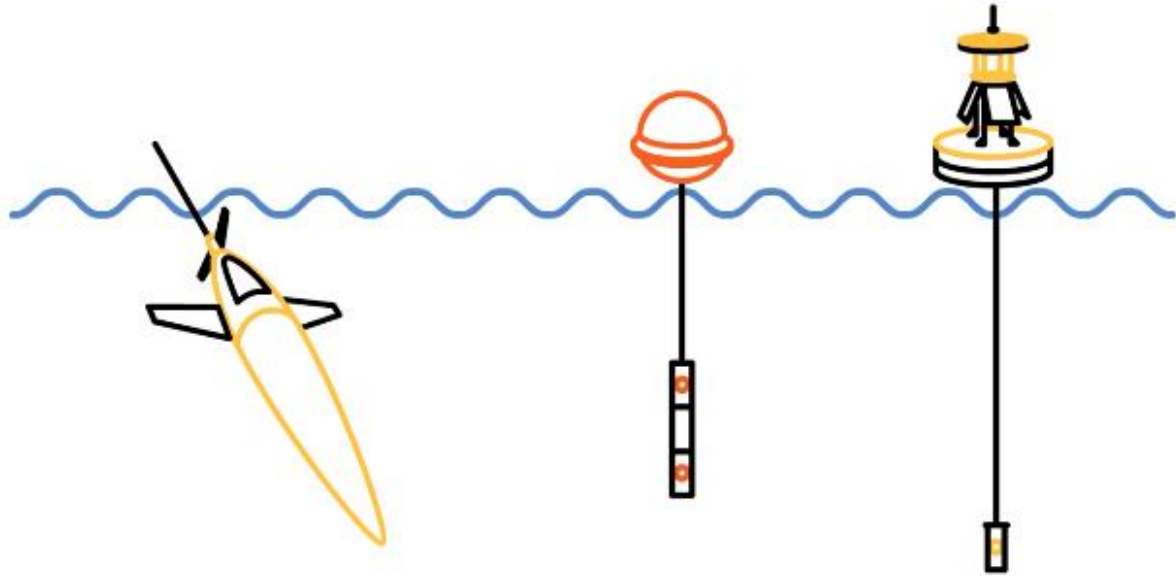


Figure 1: Examples of Oceanographic Platforms

2.2 Process Overview

The gListen Board enables and facilitates more efficient deployment, operation and access to high quality hydrophone data by scientists, the public and authorities.

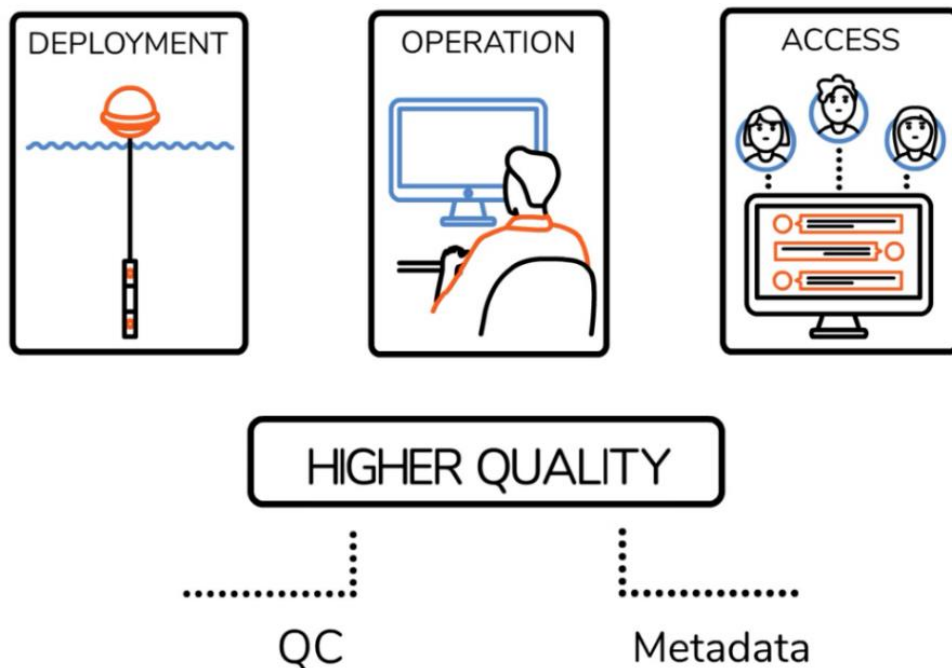


Figure 2: gListen Board enables efficient deployment, operation & access by scientists, public & authorities

2.3 Technical Data

The gListen Board is a multimodular controller board (MMCB) consisting of a microcontroller unit (MCU), Ethernet module, and RS232 module.

The Real Time Clock (RTC) battery is a standard CR1225 3V battery.

The RS232 module and Ethernet module is 3.3V.

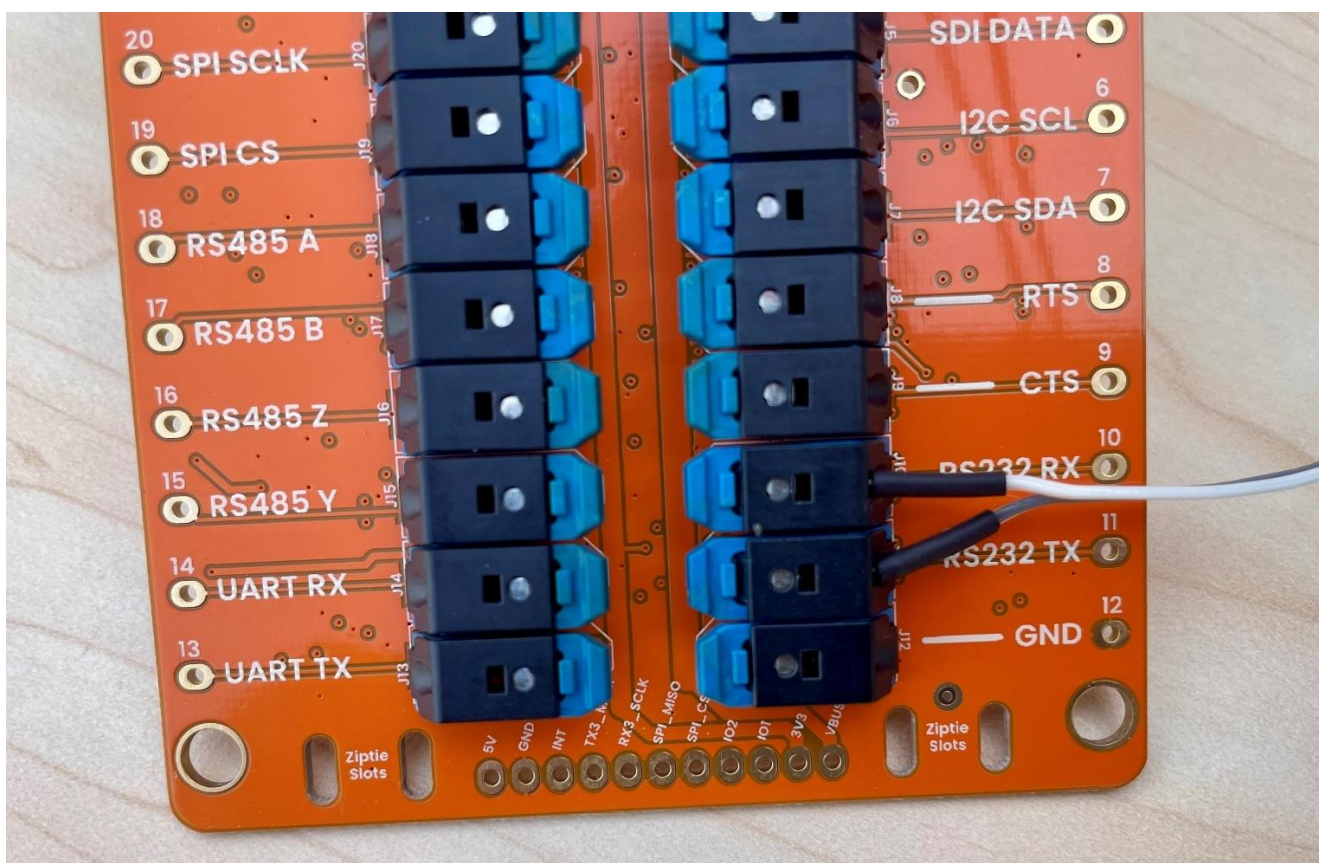
Power Parameters

- Reverse polarity protection equipped with a fuse for safety
- Short circuit protection

Hydrophone Interface

The Ethernet module is a 10/100 Base-T/TX Ethernet transceiver with cable diagnostics. The Ocean Sonics icListen smart hydrophone interface is Ethernet with two twisted pairs. For increased reliability, the selected speed is 10Base-T (maximum transmission speed of 10 Mbps).

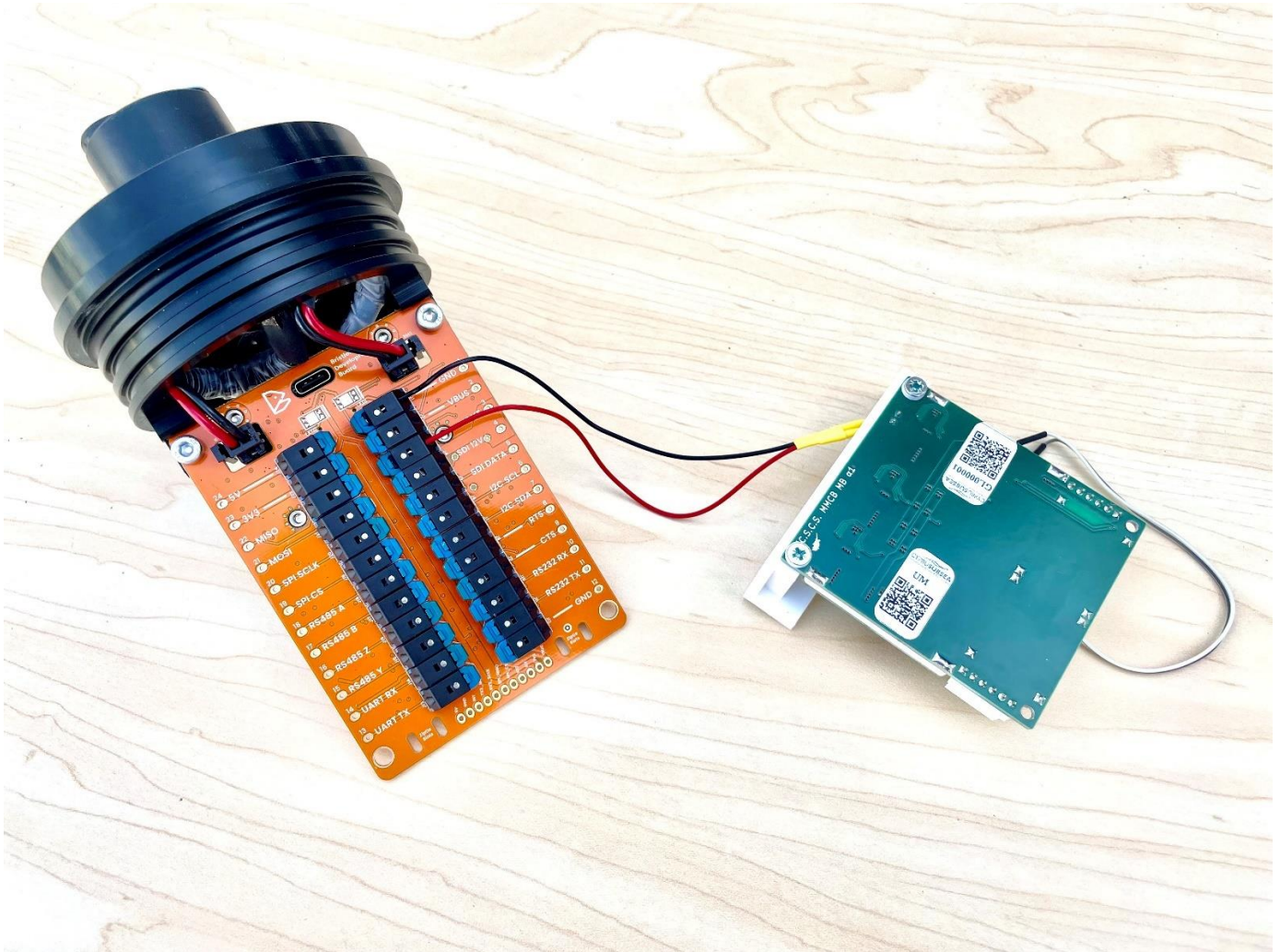
As a feature in Ethernet networks, autonegotiation enables interconnected devices to automatically determine and select the optimal settings without the need for human intervention. No need to manually select settings.



White wire of gListen Board → RS232 RX of Bristlemouth Board
Grey wire of gListen Board → RS232 TX of Bristlemouth Board

Power Control

The gListen Board has built-in power switches to power the icListen hydrophone on and off.



Black wire of gListen Board → GND of Bristlemouth Board
Red wire of gListen Board → VOUT of Bristlemouth Board

User Interface (UI) Hardware

The RS232 user interface hardware with receiver (RX), transmitter (TX) and ground shared with the power ground. The RS232 module has the optional automatic shut down functionality for lower power applications.

Baud Rate: 115200 (8 data bits, 1 stop bit, parity none)

No extra connectors and wires are necessary to connect to the Bristlemouth Development Board. The gListen board is directly connected to the Bristlemouth Development Board.

Features

- Minimizes engineering effort by protocol translation and voltage regulation
- Provides onboard data processing capabilities

NOTICE: gListen Board is considered electrical and electronic equipment (EEE) & must be disposed of properly. Review Section 7. Disposal of gListen Board for more details.



2.4 User Interface Functionality

Interactions with the gListen Board consist of commands sent from the user and responses from the board. Commands are special ASCII strings ending with Carriage Return, Line Feed (<CR><LF>) symbols.

The user interface provides information about the connected hydrophone including the hydrophone model, serial number, version of firmware, and configured triggers.

The main functionality of the user interface is setting event triggered recordings. Ocean Sonics refers to this functionality as Epoch mode. The icListen smart hydrophones can be configured to detect specific signals in real-time data. Five independent triggers can be set, each with a unique trigger signal and unique actions based on that signal.

As Ocean Sonics notes in their documentation, Epoch mode can increase the relevance of collected data by recording only specifically triggered events. It is recommended that baseline data can be collected at a deployment site to help guide the setup of the epoch triggers for optimal results.

Users can add, delete, and change epoch settings. Up to five independent triggers can be set, each with unique actions such the minimum and maximum frequency, threshold, trigger duration, recording duration (pre-event & post-event), and wave and FFT data types.

For more details about the CLI commands, see *gListen Command Line Interface Guide*.

2.5 Powering On Sequence

After powering on the gListen board and hydrophone, an Ethernet link is established every time. With this link established, the gListen board requests information about the hydrophone, including the model, serial number, firmware version, and configured triggers.

The gListen board synchronizes the time of the hydrophone with gListen's RTC. Next, the gListen board opens a streaming telemetry port and waits for Epoch messages. After receiving Epoch messages, the gListen board sends it to the user via the RS232 interface. Periodically, the gListen board sends a keepalive signal to the icListen smart hydrophone to maintain a connection between the two devices.

2.6 LED Indicators

The gListen Board has 3 blue LEDs. One LED is in the center, and two are on the Ethernet module.

The central LED displays the status of the board. After powering the unit on, the central LED is ON, and after the connection with the icListen hydrophone is established, the central LED shuts off.

The Ethernet module LEDs display the statuses of Ethernet connection and its activity.

3. SAFETY INSTRUCTIONS

3.1 How to Use gListen Board Safely

Product Limitations & Restrictions

When properly connected to marine sensors and platforms within a subsea watertight enclosure, the gListen Board can operate in harsh marine environments including extreme pressures, temperatures, mechanical stress and corrosive agents.

If the IP address settings are correctly configured, any gListen Board can be connected to any icListen Smart Hydrophone. If they are not correctly configured, change the IP address on both the hydrophone with Ocean Sonics' Lucy software program and gListen Board as noted in the *Command Line Interface Guide*.



Figure 3: gListen Board

4. INSTALLATION WORKFLOW

4.1 Installation instructions: micro-wet-mate subsea connectors

Greasing & Mating

It is recommended to grease and mate the connectors above water. However, submerged mating in depths less than three meters is possible.

- Apply silicone grease, such as **Molykote 44 Medium**, to approximately 10% of the depth of the female contact socket cavities.
- Confirm that the openings of all female sockets are sealed with grease.
- Ensure a thin layer of grease covers the face of the female-contact connector.
- Mate and demate the connector to inspect for grease on all male contacts before remating.
- Mate and demate by pushing straight in and pulling straight out and never at an angle.
- Repeat these processes using new grease whenever male and female connectors are demated and remated.

NOTICE: Always grasp the connector body, and never try to demate connector by pulling on the cable.

4.2 Cable Management

After both subsea connectors of the icListen smart hydrophone have been properly mated to the subsea electronics enclosure, carefully route and secure the cable. Ensure the loose cable is secure to itself or the oceanographic platform. Ensure the cable will not be caught on any objects when the entire system is deployed in the sea.



Figure 4: Bristlemouth with gListen Board connected to Ocean Sonics icListen Smart Hydrophone

5. MAINTENANCE

Necessary Equipment

- Clean Damp Cloth
- Soft Dry Cloth

Cleaning Cable Assembly

Clean the subsea watertight enclosure as required, such as after a deployment. When still connected to a marine sensor and platform, rinse all the equipment with fresh, clean water. Use a clean damp cloth to remove any salt or other residue. Use a soft dry microfiber cloth to dry the subsea watertight enclosure and icListen hydrophone.

When the marine equipment is dry, inspect the subsea watertight enclosure before disconnecting the connector.

NOTICE: After deployments, the dry-mate connector nut may be loose. This is normal.

Inspection

- Carefully inspect the cable and plugs. They must be free of cuts, tears and separations.
- Once disconnected:
 - Inspect the respective connectors for bent or otherwise damaged pins and corrosion.
 - Carefully inspect the rubber condition near the metal shell of the dry-mate connector, for tears.

Cleaning dry-mate subsea connector

- Clean the plug and receptacle carefully by hand.
- Only use a bristle brush (plastic or synthetic hair, not metal), liquid soap and water.
- Dry the connection by shaking off excess water.
- Use alcohol to eliminate the remaining water.
 - Flood the connector with alcohol, then pour it out and allow the connector to air dry.

NOTICE: Compressed air contains many contaminants such as water, oil and dust. It should not be used.

Storing gListen Board in subsea watertight enclosure

- After properly cleaning connectors, apply a thin coat of silicone grease as noted above.
- Place the subsea enclosure in a dry, cool location that is not subject to direct sunlight.

CAUTION! Do not attempt to repair or replace any parts of the cable assembly. Contact Cyprus Subsea Consulting & Services Ltd. if the smart cable assembly is not operating as expected.

6. DISPOSAL

Once gListen Board has reached the end of its productive life, end-users must not dispose of this waste electrical and electronic equipment (WEEE) in rubbish bins or similar means of municipal waste collection. In other words, gListen Board must not be disposed of as unsorted municipal waste.

In fact, many of the product's components (e.g., cabling and connectors) and materials can be recovered, re-used or recycled.

Instead, end-users shall collect WEEE separately. For product disposal, contact your local government agency regarding WEEE.



7. WARRANTY & LIABILITY

The manufacturer offers a 12-month warranty against defects in material or workmanship from the date of purchase. The warranty does not cover the damage or breakage due to the abusive use or negligent care of the cable assembly. We guarantee that the equipment conforms to the specifications of the safety and performance standards currently in force and applicable to it.

NOTICE:

- Ensure the gListen Board is physically intact, with no broken components or damaged parts. Visually inspect the board and discontinue use if cracks or discoloration are found.
- Do not attempt to repair or recondition the gListen Board may damage the electrical components.
- Failure to properly connect the gListen Board to the smart hydrophone and/or the oceanographic platform will result in intermittent readings, inaccurate results, or no data transmission.
- To avoid damage to the subsea cable, always hold it by the connector rather than the cable when connecting or disconnecting either end.
- Always refer to the smart hydrophone and oceanographic platform's operator's manuals for complete instructions and additional recommendations.