

Size: 3.1 x 7 x 1.6 cm (1.2 x 2.8 x 0.6 in.).
Note: Photos show electrical pins at bottom, to plug into connection below it. See drawing 41453 for a side connection.

Inductive Modem Module

IMM

Overview

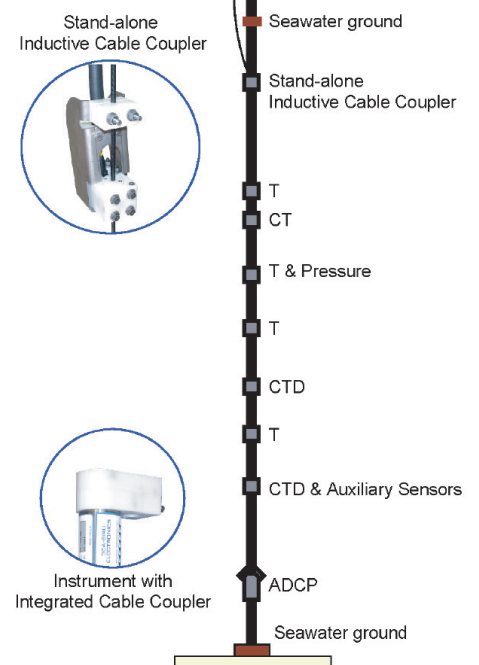
Inductive modem telemetry is a proven technology for real-time communication between underwater devices and moored buoys. Early inductive modem systems were instrument-specific and highly constrained. The Inductive Modem Module (IMM) sets a new standard for inductive modem telemetry and opens the door to a new generation of compact, low-power devices for real-time applications. The IMM is designed to interface with existing devices or to be placed as a component on printed circuit boards in instruments such as the SBE 37-IMP, 37-IMP-ODO, 39-IM, and a growing selection of moored instruments made by other manufacturer.s

Features

- Highly integrated, low-cost OEM component
- Very low power: 15 mW active, 300 μ W idle
- Compatible with all Sea-Bird Inductive Modem (IM) products
- User-enabled wake-up tone detect
- RS-232 or logic level serial interface
- Optional hardware handshake lines (1 open collector output, 1 input).
- Binary data support.
- 8 Kbyte FIFO reply buffer
- Supports direct cable connection to IM line with additional transformer
- User-adjustable timeouts and delays
- 120 bytes/second IM transmission for characters > 0x20, TAB, CR, and LF.
- Multiple transmit power levels
- IM line status monitor detects transmitting devices
- Sea-Bird's field-proven IM telemetry, with more than 3000 Sea-Bird IM instruments deployed since 1997
- Five-year limited warranty

Components

An IM system provides reliable, low-cost, real-time data transmission for up to 100 IM-enabled instruments using plastic-coated wire rope (typically 3x19 galvanized steel) as both transmission line and mooring tension member. IM instruments clamp anywhere along the mooring, which is easily reconfigured by sliding and re-clamping instruments on the cable. In a typical mooring, an IMM in the buoy communicates with IM instruments and interfaces to a computer/data logger (not supplied by Sea-Bird) via RS-232. The data logger is programmed to poll each IM instrument for data, and sends the data to a satellite link, cell phone, etc.



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Advanced Features

IMM advanced features assist existing techniques and support development of the next generation of mooring systems:

Output Tags - The IMM uses markup tags to pass data to the Host in a structured format. Markup tags are key words that identify the associated data. The similarity to XML is a convenience for data output only; the IMM does not require XML input. The markup tags allow a more structured approach to data processing without compromising traditional methods. IMM Output Tags and Data Tags should not be treated as XML unless the user-settable data follows the rules of XML. The IMM does not force XML compliance on users.

Host ID String - The Host ID is a user-settable 64-character string stored in the IMM's persistent memory. It provides a means of identifying the instrument connected to the IMM without interacting with the instrument itself.

Host Data File - The Host Data File is a general-purpose, 4-Kbyte persistent memory space in the IMM for application-specific information. It can store data describing the Host instrument, binary code for Host data processing, XML data, the Host command set, or network-specific interface data. The Host Data File can be uploaded through the IM interface.

Serial Number Addressing - Previous IM systems used user-programmed device IDs to address instruments on the network. If two devices were accidentally deployed with the same ID, neither instrument would communicate properly. The IMM solves this problem with optional Serial Number Addressing. Commands may be addressed to a specific IMM's 8-digit decimal serial number. Serial numbers are programmed at the factory and cannot be modified.

Group Command Addressing - Group commands allow addressing of pre-defined instrument groups. For example, it may be useful to put all SBE 39-IM temperature recorders in Group 1, all SBE 37-IMP MicroCATs in Group 2, etc., allowing you to set / reset parameters in similar instruments at the same time. A maximum of 9 groups can be defined per mooring.

Discovery - Discovery is the automated process of identifying devices connected on an IM network. This allows recovery from deployment or configuration errors and has considerable potential in more complex self-configuring systems. The Host starts the discovery process with the DISC command. The IMM responds in seconds with a list of serial numbers of IMM's detected on the network.

Sample Data Memory - Sample Data is a 16-Kbyte persistent memory space reserved for passing data from IMM-equipped instruments to data collectors or buoy controllers. Sample Data Memory is limited to 40 stored samples. Sample Data provides a level of independence between devices collecting data and devices recording data. Each new instrument can be programmed to write data to the IMM's Sample Data Memory. The buoy controller periodically checks IMM's for new samples, uploads data, and clears successfully uploaded samples. The buoy controller can tag the data with the Host ID stored in the IMM, allowing it to use the same code to upload data from any IMM-equipped instrument.

Power Requirements

Communicating with 1 or more IM instruments requires use of Surface Inductive Modem (SIM) or Inductive Modem Module (IMM), which provides standard serial interface (RS-232) between user's computer & up to 100 IM-compatible sensors coupled to single cable. An Inductive Cable Coupler (ICC) is always required if specifying SIM-COUPLED, & is often required if specifying an IMM.

ICC Version 4a is a 20-turn coupler, while Version 4b is a 100-turn coupler. Other couplers are available for OEM applications (contact Sea-Bird for ordering information). Table below summarizes power requirements for each:

	20 Turn ICC (version 4a)	100 Turn ICC (version 4b)	8 Turn ICC (OEM version)	Direct Cable Connection (no ICC)
SIM	35 mA	20 mA	Not allowed	20 mA
IMM - Low power transmit setting ¹	Not allowed	1.2 mA	Not allowed	1.3 mA
IMM - Full power transmit setting ¹	12 mA	4 mA	Not allowed	40 mA
Underwater Inductive Modem (UIM) ²	Not allowed	Not allowed	15 mA	Not allowed

¹ IMM power setting is set with `SetEnableFullPwrTx=` command.

² Underwater Inductive Modem is a component used by OEMs to integrate Sea-Bird's IM technology with a third-party sensor.