SEA-BIRD SCIENTIFIC

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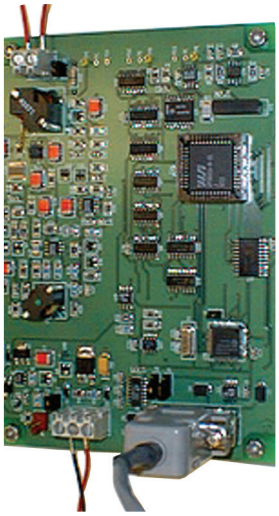
Surface Inductive Modem
SIM

The Surface Inductive Modem (SIM) is a vital link in Sea-Bird's inductive modem (IM) telemetry systems, which provide data communications without the need for underwater electrical connections. Each system requires:

- **SIM**, housed in a buoy or on land. The SIM provides the link between the underwater IM instruments and computer / buoy controller. Communication with the computer / buoy controller is via RS-232.
- **Underwater IM instruments**. The SIM can link to up to 100 inductively coupled instruments on a jacketed mooring wire. Compatible instruments include:
  - SBE 37 MicroCAT C-T (optional pressure) Recorder – 37-IM, 37-IMP (integral Pump), and 37-IMP-ODO (integral Pump and integrated Optical Dissolved Oxygen).
  - SBE 39-IM Temperature (optional pressure) Recorder.
  - SBE 16plus-IM and 16plus-IM V2 SeaCAT C-T (optional pressure) Recorder, which can acquire data from optional auxiliary sensors (oxygen, fluorescence, etc.).
  - Underwater Inductive Modem Module (UIMM) or SBE 44 Underwater IM, which links to a current meter, Doppler profiler, etc. with a standard serial interface.
  - Instruments by other manufacturers with built-in Sea-Bird underwater IMs.



Features

- Communication link between SIM and underwater IM is half-duplex, so talking and listening is sequential.
- SIM and user's computer/controller communicate at 1200, 2400, 4800, or 9600 baud; SIM and underwater IM communicate at 1200 baud.
- Sea-Bird's field-proven IM telemetry, with more than 3000 Sea-Bird IM instruments deployed since 1997.
- Five-year limited warranty.

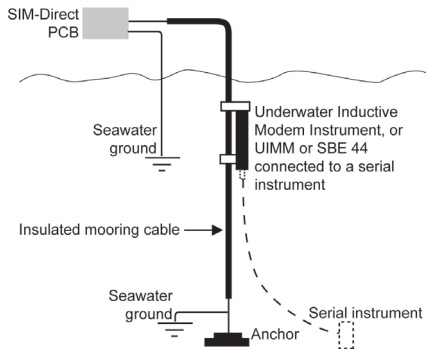
Components

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, a SIM 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.

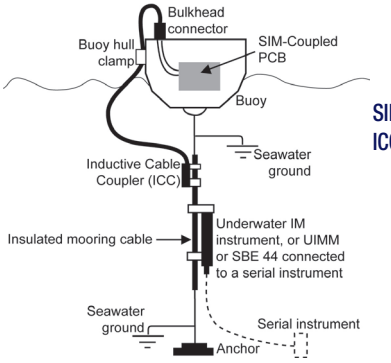
Options

- **SIM-Direct:** In typical cable-to-shore applications, the bottom end of the wire is grounded to seawater, and the top end is insulated all the way to the SIM connection. A second wire from the SIM connects to seawater ground, completing the circuit.
- **SIM-Coupled:** In typical surface buoys it may be preferable to connect the jacketed mooring wire to the buoy with a length of chain, grounding the jacketed wire to seawater at each end. An Inductive Cable Coupler (ICC) connects the SIM to the jacketed wire above the uppermost underwater inductive instrument and below where the wire is grounded.

SIM-Direct: Direct Connection



SIM-Coupled: ICC Connection



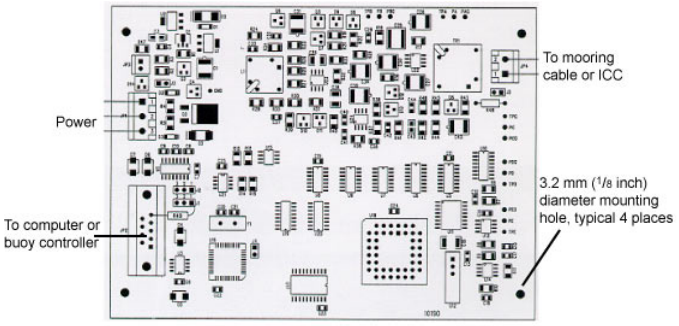
Commands

Commands sent to the SIM can be directed to the SIM, the underwater IM, or the serial instrument connected to the underwater IM (if applicable). Commands below apply only to the SIM – see the appropriate underwater inductive modem manual for its commands.

COMMAND	DESCRIPTION
PwrOn	Send wakeup tone to all underwater modems.
PwrOff	Send power off command to all underwater modems, and turn off transmitter. Underwater modems enter quiescent (sleep) state. Any data in underwater modem buffer is erased.
AutoPwrOn=x	**x=Y** (default): Send **PwrOn** to underwater modems when power applied to SIM. This wakes up all UIMs on line. **x=N**: Do not send **PwrOn** to underwater modems when power applied to SIM.
DS	Display SIM firmware version and status.
Baud=x	**x =** baud rate between SIM and computer/controller (1200, 2400, 4800, 9600). Default 9600.
DataNNMax=x	**x =** timeout for **Dataii** or **!iiData**. If no reply received within x (0-32767 msec), control returned to computer and other commands can be sent. Default 1000 msec.
RelayMax=x	**x =** timeout for all other commands. If no reply received within x (0-3276 sec), control returned to computer and other commands can be sent. Default 20 sec.
EchoOn	Echo characters received from computer (default).
EchoOff	Do not echo characters received from computer.
BinaryGap=x	**x =** termination timeout (0–65535 msec) for commands requesting SBE 44 binary response. Gap of **x** since last byte received acts as termination character. Bytes sent after gap are ignored; control is returned to computer and other commands can be sent. Default 1000 msec.

Control of SIM can be re-established sooner than timeout by pressing Esc and then Enter. When S> prompt displays, new commands can be sent.

SIM	**Sensor Interface to computer or buoy controller:** RS-232C; 1200, 2400, 4800, or 9600 baud; 8 data bits; no parity; echoing or no echoing of characters. **Current:** 30 mA communicating, 27 mA quiescent state (PwrOff). With control line, < 10 µA when turned off. **Voltage Input:** 7-25 VDC.
Underwater Instrument	See SBE 37-IM, 37-IMP, 37-IMP-ODO, 39-IM, 16plus-IM, 16plus-IM V2, 44, and UIMM datasheets
ICC	See Inductive Cable Coupler datasheet



Dimensions:
PCB: 109 mm x 147.5 mm (4 1/4 x 5 3/4 inches)
Mounting holes: 90.5 mm x 138.1 mm (3 9/16 x 5 7/16 inches)

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