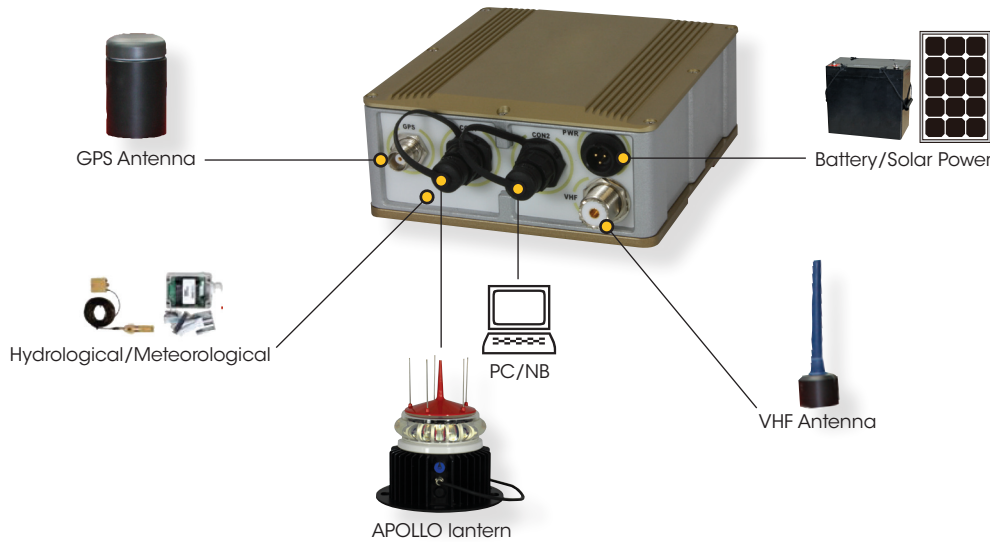


AIS Solutions

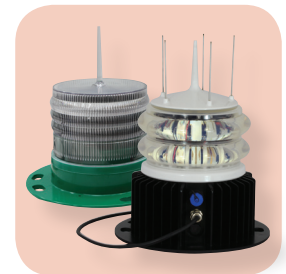
(Automatic Identification System)



Ocean buoys



Self-contained lanterns



APOLLO-155 & SL-125 lanterns

The Sealite Advantage

- Complete AIS solutions displaying accurate positioning & operational information about the AtoN
- Type 1 & Type 3 models available
- Low power consumption, making the units ideal for solar & AtoN installations
- Accurate & real-time information
- Supports synthetic & virtual transmissions
- Supports messages 21, 6, 7, 8, 12, 13, 14 & 25 (dependent on hardware & software configuration)
- Supports meteorological & hydrological (message 8)
- Fully compliant with IALA, IEC & ITU standards
- BSH, CE, FCC & USCG approved
- Capable to repeat SART, 6, 8 messages (Type 3 only)
- Supports remote configuration control (Type 3 only)
- Supports chaining to extend transmission range (Type 3 only)

Sealite's AIS solutions are available in Type 1 or Type 3 and operate on the international VHF Maritime Mobile Band, enabling Port Authorities and other users to remotely monitor the real-time status of their AtoN installations.

The Type 1 or Type 3 AIS solutions can be configured to a range of Sealite products, including ocean buoys, solar marine lanterns, and stand-alone models.

Mariners in the broadcasting region are provided with crucial Message 21 information (as defined by the International Telecommunications Union (ITU)) such as AtoN operational status and positioning - revolutionising the VTS system by expanding AtoN information availability to users.

In addition, the AIS enabled AtoN broadcasts AIS Message 6 received by the designated base station, allowing the operator to monitor the AtoN for solar and battery voltage, flash code setting and light status. Meteorological and hydrological data and a host of other parameters can be fitted.

Low Power Consumption

Sealite's AIS solutions have an incredibly low power consumption of less than 0.5 Ah/day making them suitable for a large range of solar installations. The compact AIS AtoN Transponder is available installed within Sealite's range of self-contained lantern assemblies - providing installation flexibility and operational reliability for a range of environmental conditions and demanding duty cycles.

Synthetic & Virtual AIS AtoNs

Sealite's AIS AtoNs are able to support real, synthetic and virtual transmissions. Versions of the self-contained AIS Transponder are available without the lantern integration to enable the benefits of AIS if a visual navaid is not required.

A synthetic AIS AtoN refers to an AtoN object that has no AIS AtoN installed, but has been assigned a position/name (via message 21) by another real AIS AtoN.

A virtual AIS AtoN refers to a location where there is no actual existence of an AtoN object. The virtual AIS AtoN is assigned a position/name (via message 21) by another real AIS AtoN. In general, virtual AIS AtoNs are used for emergency or temporary situations.

Type 1 & Type 3 AIS AtoNs

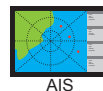
AIS AtoNs use either the FATDMA (Fixed Access Time Division Multiple Access) or RATDMA (Random Access Time Division Multiple Access).

Type 1 AIS AtoN uses the FATDMA access scheme and can only transmit AIS signals. This means the AtoN requires a nearby base station to reserve the slots (message spaces) used by the AIS enabled AtoN.

Type 3 AIS AtoN has the capability to transmit as well as receive and uses the RATDMA access scheme. This allows the AtoN to autonomously allocate slots for its own transmission by listening to AIS frequencies and determining which slots are available for use.

The Type 3 AIS AtoN is able to be installed at any location because, unlike Type 1 AIS, it does not require slots to be reserved and can therefore be used in areas with or without a base station. Sealite's Type 3 AIS is able to 'chain' several units together to extend the transmission range.

The Type 3 AIS AtoN can also support remote control functions including lantern flash character, ON/OFF activation and intensity setting.



Sealite's AIS AtoNs can be delivered pre-programmed or can be provided with software enabling the user to program the unit

Contents of AIS Message 21

- Type of AtoN
- Name of the AtoN
- Position of the AtoN
- Position accuracy indicator
- Type of position fixing device
- ON/OFF position status
- Real and Virtual AtoN identification
- Dimension of the AtoN and reference positions
- Status of the AtoN systems

Programming

Sealite is able to deliver pre-programmed AIS AtoNs or can provide a software application to enable the user to program the unit via an RS232 interface.

AIS AtoN Applications

The use of AIS as an AtoN can provide benefits and services to both vessels and port authorities. Some of the descriptions below are taken from IALA Guideline No. 1062.

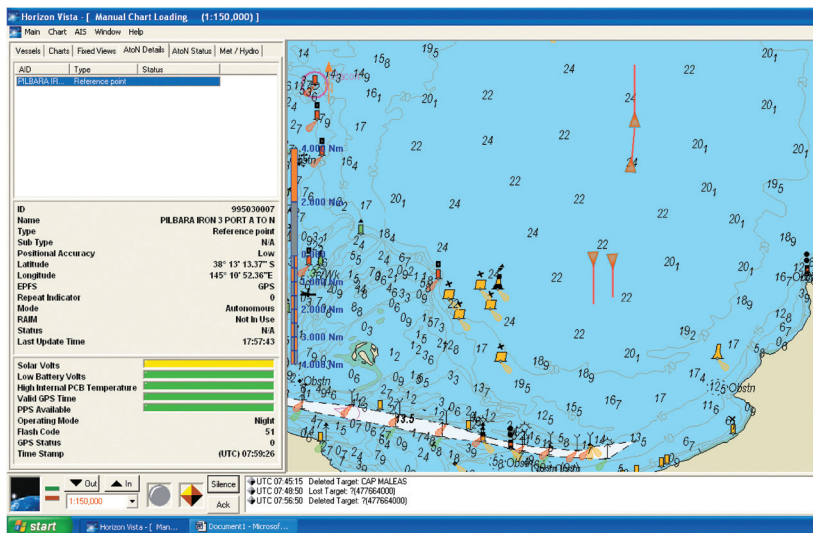
Services to AIS equipped vessels

- Provide identification of the AtoN in all weather conditions
- Complement existing signals from AtoN (e.g. Racon)
- Transmit accurate positions of floating AtoN
- Indicate if a floating AtoN is off position
- Mark or delineate tracks, routes, areas and limits (for example, areas to be avoided and TSS)
- Traffic Separation Schemes (TSS)
- Mark offshore structures (for example, wind turbines, wave and tidal energy devices, oil and gas platforms)
- Provide weather, tidal and sea state data
- Provide additional AtoN capability through use of virtual AIS AtoN where installation of physical AtoN is technically or economically difficult
- Indicate AtoN status
- Provide an accurate position for fixed AtoN which acts as reference targets for verifying radar

Benefits to AtoN Authority or Port Authorities

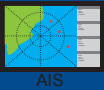
- Monitor the status of an AtoN
- Track AtoNs that are off position
- Assist in the identification of ships involved in collisions with AtoN through provision of exact AtoN position data
- Gather real-time (or near real-time) information on the 'state of health' of an AtoN
- Remotely control changes in AtoN parameters (if so equipped)
- Provide statistics on reliability of AtoN

Example of operational information provided to base station user.



Typical view from port operator console showing AtoN data, including Message 21 (AtoN name / position) and Message 6 (lantern diagnostics)





AIS Solutions

(Automatic Identification System)

SPECIFICATIONS * *

Applicable Standards

IALA
IEC
ITU

IALA A-126
IEC 60945, IEC 61108-1, IEC 61162-1, IEC 62320-2
ITU-R M. 1371-3

Power Consumption

FATDMA* (Ah/Day)

RATDMA* (Ah/Day)

Type 1: < 0.288
Type 3: < 0.432
Type 1: n/a
Type 3: < 1.656

Transmitter Performance

TX Frequency Range (MHz)
Frequency Accuracy (Hz)
Channel Space (KHz)
Channel Protection
Modulation
Data Rate (bps)
TX Power Control (Watt)
Carrier Power Error (dB)
Nominal Impedance

156.025 ~ 162.025
±500
25
1 Sec max on air
GMSK / FM
9,600
2 / 5 / 12.5 (programmable)
±1.5 (normal)
50Ω

Receiver Performance (Type 3 only)

Number of Receivers
RX Frequency Range (MHz)
Sensitivity
Data Rate (bps)
PER
Co-Channel Rejection
Adjacent Channel Rejection
Nominal Impedance

2
156.025 ~ 162.025
PER 20% at -107 dBm
9,600
20% at -107 dBm
10dB at 1 KHz offset
70dB at 25 KHz
500Ω

GPS Receiver

Receiving Channels
Tracking & Navigation Sensitivity (dBm)
Reacquisition Sensitivity (dBm)
Horizontal Position

50 channels
≥ -159
≥ -159
< 2.5 m Autonomous
<2.0 m SBAS
SBAS: WAAS, EGNOS, MSAS, GAGAN

Receiver Type

Environmental

Operating Temperature
Storage Temperature
Humidity

-20 ~ +55°C
-30 ~ +70°C
95% relative humidity at 40°C

Input/Output

- 1) One RS-232 port for configuration
- 2) One RS-232 port for communication
- 3) One isolated control output - N.C. relay for alarm indication (default) or other control usages
- 4) One isolated status input channel with 5 mA constant current sink for external device status input (e.g. read light fault, light on/off etc.)
- 5) Four ADC channels for external sensors
- 6) VHF Connector (M Type)
- 7) GPS Connector (TNC Type)
- 8) More extra I/O interfaces can be supplied via optional extension I/O board

Software Tool

AMEC AtoN Configuration

PC configuration utility

• Specifications subject to change or variation without notice
* Subject to standard terms and conditions
At 12.5W; transmission scheduled every 3 min

