

# ATONIS HR

## AIS Transponder Integrated into Self Contained Solar Power System

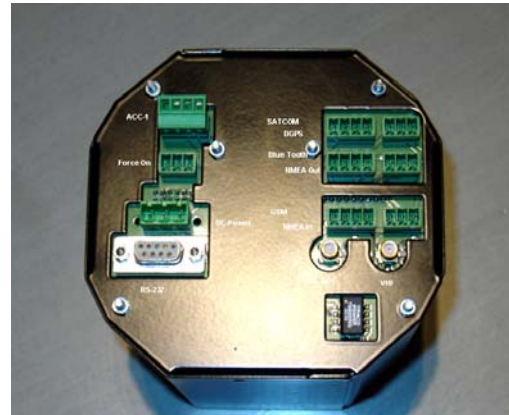
ATONIS is a unique, state-of-the-art, modular, Aids to Navigation Information System designed to operate seamlessly in an AIS VDL environment using FATDMA or optional CSTDMA and RATDMA protocols. It is the first AIS AtoN transponder designed to be fully compliant with the governing directives for AIS AtoN transponders; IALA Recommendation A-126, ITU-R M.1371-1/2 and IEC Standard 62320-2. It is designed to fit within a standard 155mm lantern housing, but can also be mounted in an external enclosure, suitable for use on buoys and offshore platforms.

ATONIS is available in Type 1, 2, or 3 models and has the capability to transmit all standard AIS AtoN, Weather and Hydrological messages, as well as monitor and control the AtoN equipment installed on buoys and offshore platforms. ATONIS is also software configurable to permit the automatic activation of lights or signals when vessels come within range, transmit a safety-related Message 14 when a vessel comes within a pre-set range to a hazard, transmit Message 21 for synthetic or virtual AtoNs, or store a record of ships that come within a pre-set range for later downloading to a shore station. Special applications, such as transmitting channel management command Message 22 in areas using regional AIS channels, or storing ship activity in areas not covered by a shore-based AIS infrastructure and reporting this data via long-range SATCOM, are also possible as optional features.

ATONIS consists of a modular **Base Board** responsible for all scheduling, status checks, generation of messages, data storage and for controlling the modular subsystem boards and components connected to it. Subsystem boards and components that can be connected to the Base Board are the **AIS Transmitter** board, **AIS Receiver** board(s), **GSM/GPRS Radio** component, and an **Inmarsat D+** component, depending on the particular application, as well as **Met/Hydro** sensors.

ATONIS, when equipped with Automatic Power's proprietary ACC-1 controller, provides the AtoN authority with a very versatile unit by providing (4) digital I/O interfaces, (4) analog interfaces and RS-232/485 interfaces permitting extensive monitoring and control of AtoN equipment.

ATONIS configuration is accomplished via RS-232 or an optional Bluetooth™ connection for in-field servicing without having to go aboard or lift a buoy to access the transponder.



ATONIS AIS Transponder

The compact size and extremely low power consumption makes it possible to integrate the ATONIS unit into a self contained solar power system. Designated the ATONIS HR, this unit may be mounted in the place of a marine lantern and allow the monitoring of the position of met/hydro or tsunami buoys and issue messages to vessel in the local area of the buoy..



ATONIS AIS Transponder fitted in Self Contained  
Solar System Housing

Pharos Marine   
Automatic Power

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# ATONIS AIS Transponder

<b>Specifications</b>			
Fitting	Fittable within 155mm Lantern Housing or mounted in suitable enclosure		
Input Voltage	9 to 36 VDC		
Electrical Isolation	DC isolated, 1500VDC insulation barrier to prevent galvanic currents		
Protection	Overcurrent and Reverse Polarity protection		
Power Consumption @ 12 VDC	Continuous Mode <sup>1</sup> : 250 – 500 mW (0.5 – 1 Ah per 24 hour period) Lean Operation Mode <sup>2</sup> : 25 – 50 mW (50 mAh – 100 mAh per 24 hour period)		
Ports	<table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">                     RS-232 – Configuration                      Port 1 – SATCOM (default)                      Port 2 – dGPS (default)                      Port 3 – Bluetooth (default)                      Port 4 – Opto-isolated NMEA 0183 Out (default)                 </td> <td style="width: 30%;">                     Port 5 – GSM/GPRS (default)                      Port 6 – Opto-isolated NMEA In (default)                      Port 7 – AtoN (ACC-1 default)                      Port 8 – Control (default)                 </td> </tr> </table>	RS-232 – Configuration Port 1 – SATCOM (default) Port 2 – dGPS (default) Port 3 – Bluetooth (default) Port 4 – Opto-isolated NMEA 0183 Out (default)	Port 5 – GSM/GPRS (default) Port 6 – Opto-isolated NMEA In (default) Port 7 – AtoN (ACC-1 default) Port 8 – Control (default)
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Temperature Range	-15 ° to +50°C		
Humidity	95% relative humidity at 30°C		
Positioning	GPS/DGPS using SBAS Service (default); dGPS position accuracy < 3 m 95% DGPS using IALA Beacon Service/SBAS (optional) Message 17 (optional)		
Configuration	Via RS-232 or optional Inmarsat D+, AIS, GSM/GPRS, or Bluetooth™ connection using COTS software (e.g., MS Hyper Terminal)		
Capabilities	FATDMA (CSTDMA and RATDMA with optional Receiver Module installed)  Transmit AIS Messages 21, 6, and 14 (optional messages 8 and 12)  Optional applications, such as; remote control, automatic broadcast of Message 21 for virtual and synthetic AtoNs, transmission of safety related Message 12 when AIS vessels come within pre-set range to highlight wrecks, wind farms, etc., storing a record of ships which come within range for later downloading via AIS, GSM/GPRS or Inmarsat D+		
VHF Antenna	External		
GPS Antenna	External		
Standards	IALA A-126; IEC 60945 and IEC 62320-2; ITU-R M.1371-1/2		
Certifications	(pending) CE, R&TTE Directive (EC/1999/5) FCC, IC		
<b>Transmitter Module</b>	FM-GMSK		
Frequency Range	155 – 163 MHZ, 25kHz bandwidth, configurable		
Power Output	12.5 Watts (optional low watt setting available)e		
Frequency Stability	± 2.5 ppm		
<b>Receiver Module (Types 2 and 3 only)</b>			
Type	FM-GMSK		
Frequency Range	155 – 163 MHZ, 25kHz bandwidth, frequency agile		
Frequency Stability	± 2.5 ppm		
Sensitivity	< -112 dBm PER 20%		
Spurious Response Rejection	> 70 dB		
Adjacent Channel Selectivity	> 70 dB		
Intermodulation Response Rejection	> 80 dB @ -112 dBm		
Blocking or Desensitization	> 84 dB		
Spurious Radiation, conducted	< -57 dBm		
Co-channel Rejection	Better than -10 dBm		

<sup>1</sup> AIS AtoN report every three minutes IAW ITU-R M.1371-1.

<sup>2</sup> Monitoring of AtoN status, buoy position, and AIS reporting once every 10 minutes. Lower duty cycles will result in lower power consumption.



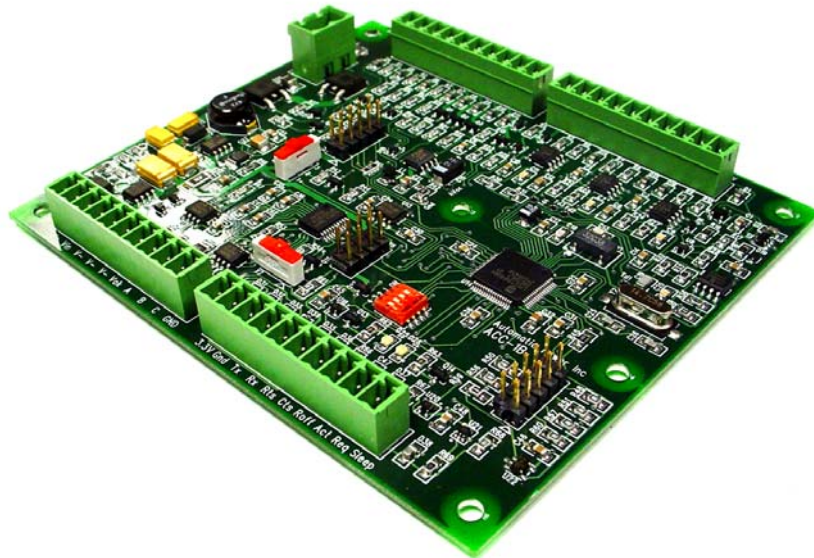
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# ATONIS AIS Transponder

## Optional Automatic Power Communication Controller – Interface Board (ACC-1)

I/O Interfaces	(1) ATONIS Transponder interface (1) RS232/RS485 port configurable by slide switch (1) RS485 port (4) Schmitt trigger-type Digital Inputs with hysteresis, protected up to 36V (4) Bi-directional, buffered, analog input channels, one of which is capable of directly sensing high side current flows (4) Open-drain FET outputs capable of directly driving relay coils rated up to 36V (1) TTL-compatible serial radio interface for interfacing with OEM radio modules
Power Consumption	17mA at 12V input in active mode
Data Storage	Standard 256K serial flash data storage for data logging (upgradeable either on the board or by attaching an external memory daughter board)
Additional Features	<ul style="list-style-type: none"><li>- Powerful ARM 32-bit microcontroller</li><li>- 10-ampere solar charging regulator</li><li>- Battery-backed real-time clock for uninterrupted time keeping</li><li>- Independent watch-dog circuitry for complete deadlock free operation by overcoming the weakness of the microcontroller's own watchdog protection</li><li>- Firmware field-upgradeable</li></ul>



ACC-1 Interface Board



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