



**SHINE MICRO**

# RADARPLUS® SM1610-2A

**RUGGED    HIGH SENSITIVITY    LONG RANGE    AIS RECEIVER**



## INTRODUCING THE RADARPLUS® SM1610-2A: Industry-proven performance in a frequency agile receiver.

When frequency agility is required, the **RadarPlus® SM1610-2A** combines superior performance with 156-162 MHz frequency coverage.

The **SM1610-2** is designed to meet all of the receiving requirements of AIS Base Stations per ITU-R M.1371-1

The **RadarPlus SM1610-2** serial data output will drive most popular marine charting software packages and ECDIS available today. The output provides the location of all AIS transponders within receiving range.

- High-sensitivity, maximum range AIS reception
- Power consumption less than 2.5 watts
- 12-channel internal GPS standard
- Shine Micro's proprietary ESP software standard
- Mast-mounted LNA included
- Superior protection against co-located transmitters and near lightning strikes

### Interface options:

- RS-232 (STANDARD)
- IEC 61162
- RS-422
- ETHERNET

## PROVEN POWERFUL PERFORMANCE.

Building from the proven success of the **SM1610**, the **SM1610-2A** is one of the **most powerful AIS tools** on the market, with demonstrated **long range performance**.

**Industry-leading tracking range** is achieved through **NOISESION** demodulator technology (patent pending), which demodulates AIS packets both forward and backward for **superior reception** of noisy, weak signals.

**System performance and installation flexibility** are optimized through an external **Low Noise Amplifier (LNA)** designed to be mast mounted at the antenna.

An optional **micro-transmitter** located inside the LNA provides an **important integrity check** of the entire receiving system by injecting a **calibrated** AIS1 and AIS2 signal at the LNA antenna input. This is useful to insure the health of the entire receiver, LNA and coaxial feed-line system. The micro-transmitter can **compensate for losses** in cavity filters and long coaxial feed-lines, which are often installation specific. A performance test report is provided with each unit.



# RadarPlus<sup>®</sup> SM1610-2A Rugged, High Sensitivity, Long Range AIS Receiver

## System Specifications

- **Designation:** AIS RX base station per ITU R M.1371-1
- **Serial interface:** IEC 61162, RS422, RS232, Ethernet
- **Power Supply:** 12 to 30 V and 120V AC
- **Power Consumption:** Less than 5 watts
- **Temperature Range:** -15 to +55 degrees C.
- **Compass Safe Distance:** 1 meter

## Navigation Specifications

- **12 channel internal Global Positioning System (GPS)**
- **GPS antenna interface:** SMA connector w/ LNA power

## Dimensions and Weights

- **Width:** 3.15 in.
- **Length:** 6.89 in.
- **Height:** 2.25 in.
- **Weight:** ≤2 lb.

## Frequencies and Channel Bandwidth

- **156.000 - 162.025 MHz at 25 kHz**

## Frequency Tuning Method

- Compliant with Draft IEC62320-1

## AIS Receivers

- **AIS Data Rate:** 9,600 bits/s
- **Sensitivity:** ≤20% PER @ -117 dBm w/ SM1610-2ALNA
- **Co-channel Rejection:** -10 dB
- **Adjacent Channel Selectivity:** 70 dB
- **Blocking:** 84 dB
- **Intermodulation:** 74 dB
- **Large Signal PER:** 1% or better
- **Image Rejection:** 70 dB
- **Spurious Rejection:** 70 dB
- **Antenna Interface:** Type N connector

## Enhanced Signal Analysis Package

Enhanced sensitivity with analysis features including:

- Received Signal Strength Indication
- Slot Numbering
- VDL Loading
- Ambient Noise Measurement
- Packet Time of Arrival
- Partial Packet Reception

## Serial Interface Details:

The serial interface of the RadarPlus conforms to ITU R M.1371-1 and NMEA 0183 V3.0 with additional proprietary sentences. The received AIS messages are output using the VDM sentence, and GPS location data is output using the NMEA 0183 sentences.

To request full serial interface specifications, please e-mail [info@shinemicro.com](mailto:info@shinemicro.com) or call Shine Micro at (360) 437-2503.

## Upgradeable

- **Future software upgrades** are easily installed through the serial port.
- **Digital Beam Forming**  
Optional external time-base and 1PPS inputs for future applications using multiple synchronized receivers to obtain maximum tracking range
- **Time of Arrival and Partial Packet Detection**  
Detection and Time-stamping of packets which are too weak to decode (signal levels of -125 dBm or less) for post-processing and future applications

## LNA Specification

- **Enclosure:** Weather Resistant
- **Connector Type:** N
- **Frequency:** 162 MHz
- **Noise Figure:** < 1 dB
- **Gain:** >12 dB
- **Power Supply:** Coax Bias
- Multi-Stage input protection

## WARRANTY INFORMATION

Shine Micro warrants its products to be free from defects for one full year from the date of purchase. Shine Micro will, at its sole discretion, repair or replace any components that fail in normal use. Labor and material costs for such repairs or replacement will be free of charge. This warranty does not cover failures due to abuse, misuse, accidents, or unauthorized alterations or repair.

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