



EXHIBIT 2

RadarPlus™ SM162B

All-in-One, Low Cost AIS Transponder

System Specifications

- o **Designation:** Class B AIS
- o **Serial interface:** subset of IEC 61993-2
- o **Power Supply:** 12.6V
- o **Power Consumption:** Less than 10 watts
- o **Temperature:** (per IEC 60945)
-25°C to +70°C (Exposed)
- o **Compass Safe Distance:** 1 meter
- o **EMC:** per IEC 62287
- o **Salt Fog:** per IEC 62287
- o **Vibration:** per IEC 62287

Navigation Specifications

- o **12 channel internal GPS and antenna**

Dimensions and Weights

- o **Diameter:** 2.0 in.
- o **Height:** 25.0 in.
- o **Weight:** 3 lbs.

Frequencies and Channel Bandwidth

- o **RX 1 & 2:** 161.500 – 162.025 MHz
at 25 kHz channel spacing
- o **RX DSC:** 156.525 MHz

AIS Transmitter

- o **Power Output:** 2 watts
- o **Harmonic Emission:** ≤ 66 dBc (< 0.25 μ W)
- o **Spurious Emission:** ≤ 66 dBc (< 0.25 μ W)
- o **Ramp Up:** < 300 μ S
- o **Ramp Down:** < 300 μ S
- o **Channel Protection:** 1 sec max on air
- o **Frequency Accuracy:** ± 3 ppm
- o **Modulation Spectrum:** per IEC 62287

AIS Receivers

- o **AIS Data Rate:** 9,600 bps
- o **Packet Error Rate:** $\leq 20\%$ at -107 dBm
- o **Adjacent Channel Rejection:** 70 dB at 25 kHz
- o **Blocking:** 80 dB
- o **Intermodulation:** 65 dB
- o **Large Signal PER:** $< 1\%$
- o **Image Rejection:** ≥ 70 dB for 20% PER
- o **Spurious Rejection:** ≥ 70 dB for 20% PER

Serial Interface Details:

The serial interface of the RadarPlus is a subset of IEC specification 61993-2, using a 38.4 kbps connection to a host computer. 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 or call Shine Micro at (360) 437-2503.

Software Tested

The **RadarPlus** allows AIS enabled software to chart ship positions and descriptions in real-time. The following packages have been tested and are fully operational with the **SM162B**:

- o Rose Point - **Coastal Explorer**
- o ICAN - **Regulus**
- o Transas - **NaviSailor**
- o Xanatos - **Titan**
- o Nobeltec - **Admiral**
- o EuroNav – **seaPro**
- o Chyna Sea – **MapTech**

Simple Marine Installation

1. Attach the SM162B to a standard 1" x 14 threaded antenna mount.
2. Connect the power cable to a 12 volt power source.
3. Connect the ground lug to a solid ground.
4. Optionally connect the serial interface cable to a PC or other AIS display device.



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 warrantee does not cover failures due to abuse, misuse, accidents, or unauthorized alterations or repairs.

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