

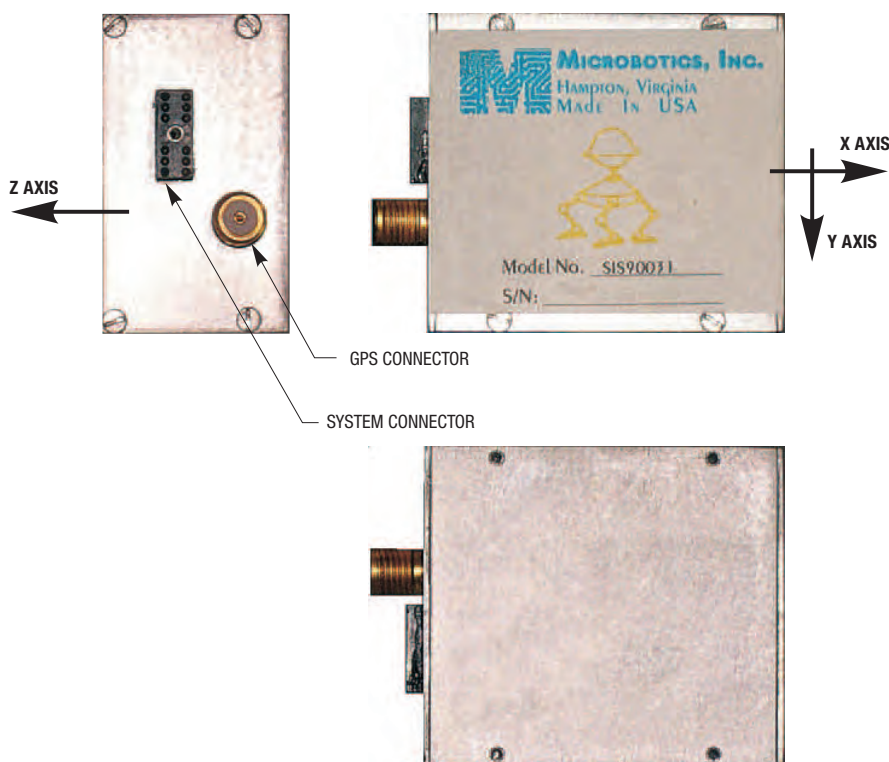
The MIDG II is a GPS aided inertial navigation system (INS) for use in applications requiring attitude, position, velocity, acceleration, and angular rates for navigation or control. An internal GPS receiver measures position and velocity and passes it to the data fusion processor to be combined with the inertial data to generate an optimal solution. An internal three-axis magnetometer provides a magnetic heading reference when needed.

Features

- Full INS Solution
- Low Power
- Light Weight
- Small Size



Sensor Axes



MIDG II Specifications ¹

Power Requirements

Input Voltage	10 VDC - 32 VDC
Power	1.2W max

GPS Antenna ²

Connector Type	50-Ohm SMA, right hand thd
Antenna Power	+5V at center conductor, 25 ma max
RF Power Input	-134 dBm min, -61dBm max

Measurements

Angular rate	
Range	± 300 °/sec
Non-Linearity	0.1% of FS
Noise Density	0.05 °/sec / $\sqrt{\text{Hz}}$
3dB Bandwidth	20 Hz

Acceleration

Range	± 6 g ³
Non-Linearity	0.3% of FS
Noise Density	150 μg / $\sqrt{\text{Hz}}$
3dB Bandwidth	20 Hz

Attitude Accuracy (Tilt)	0.4° (1 σ)
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Position Accuracy	2m CEP, WAAS/EGNOS available
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Data Output Rates	Position , Velocity, attitude, rates, accelerations – 50 Hz Raw GPS measurements – 5 Hz (WAAS/EGNOS)
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Environment

Temperature	-20° C to 70° C, operating -55° C to 85° C, storage
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Humidity	10% to 90% RH, non-condensing
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Survival Shock	100 g, 8ms., ½ sine
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Survival Vibration	6 g _{rms} , 10 Hz to 2000 Hz, random
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Output

Electrical	RS422 async., 115200 baud (configurable), 8-N-1
Pulse Per Second ⁴	RS422 pair, each side TTL compatible
Data Format	Microbotics Binary Protocol

Physical

Size	1.50" W x .87" H x 1.67" D
Weight	55 grams

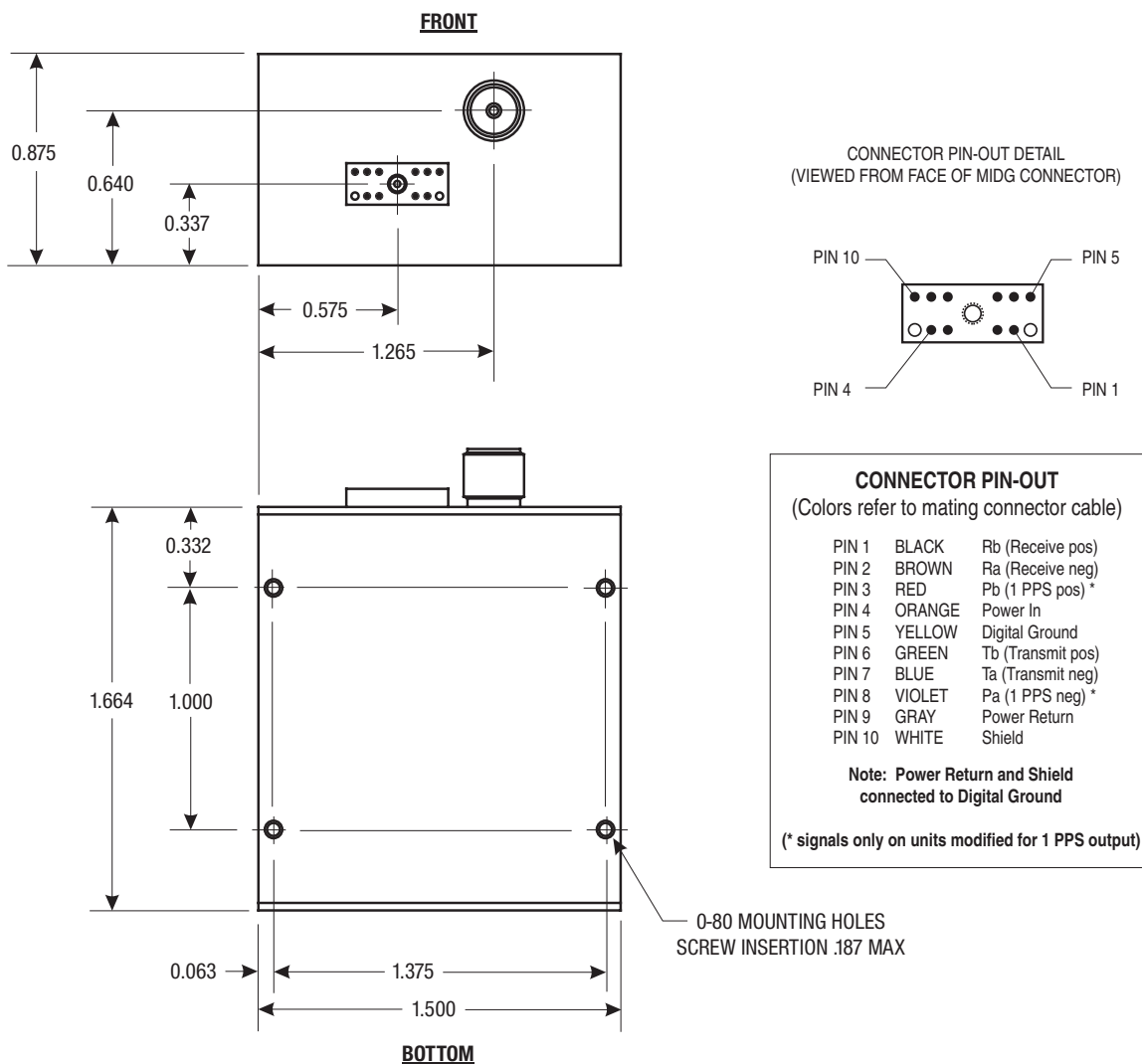
¹ Typical values.

² See section (p. 4) on active/passive antennas.

³ ± 6 g for SIS90031c, ± 10 g for other models.

⁴ Standard on SIS90031c, order option for other models.

MIDG MOUNTING DIMENSIONS AND CONNECTOR PIN-OUT



GPS ANTENNA REQUIREMENTS

1. **Antenna mounting** must be non-magnetic as a magnet will interfere with the MIDG's magnetometers.

2. **Antenna and Ground Plane**

A GPS antenna ground plane is recommended. Antenna ground plane of 7 x 7 cm (2.75 x 2.75 in.) is recommended for use with the GPS antenna (part number A-GPS5-SMA) available from Microbotics, Inc.

3. **Note on Active/Passive Antennas**

(The following information is supplied by GPS receiver manufacturer.)

Passive antennas contain only the radiating element, e.g. the ceramic patch or the helix structure. The use of an active antenna is always advisable if the RF-cable length between receiver and antenna exceeds about 10 cm. Care should be taken that the gain of the LNA inside the antenna does not lead to an overload condition at the receiver. A gain of 15 dB is usually sufficient, even for cable lengths up to 5 m. There's no need for the antenna LNA gain to exceed 26 dB for use with MIDG current receivers. With short antenna cables, gains in excess of 25dB may swamp the GPS RF front end.

When comparing gain measures of active and passive antennas, one has to keep in mind that the gain of an active antenna is composed of two components: the antenna gain of the passive radiator, given in dBic; and the LNA power gain, given in dB. A low antenna gain cannot be compensated by high LNA gain. If a manufacturer provides one total gain figure, it is not sufficient to judge the quality of the antenna. One would need information on antenna gain (in dBic), amplifier gain, and amplifier noise figure.

ALERT regarding antenna connection

5v power for active antennas is supplied via the MIDG GPS SMA connector. The GPS antenna must never be connected or disconnected while the MIDG is powered. Connecting or disconnecting the GPS antenna with power applied to the MIDG may damage the GPS receiver, and will void the MIDG warranty.

Specifications subject to change without notice.

4 of 4