

Product Data Sheet

GEDC-6E

Gyro Enhanced Attitude & Heading System



Description

The Sparton GEDC-6E Attitude and Heading System provides best-in-class reliability and superior performance in challenging dynamic and magnetic environments by combining calibrated tri-axial magnetometers and accelerometers with a set of tri-axial gyros. Proprietary state-of-the-art AdaptNav II™ algorithms allow the GEDC-6E to provide accurate attitude and heading outputs, including full 360° tilt compensation, even when subject to highly dynamic noisy operating environments and in the presence of transient magnetic interference. AdaptNav II™ also includes enhanced adaptive in-field calibration algorithms to provide superior system performance, even in the presence of magnetic distortions due to ferrous objects positioned on the mounting platform. The GEDC-6E also incorporates the World Magnetic Model allowing it to provide a True North output at all locations around the globe.

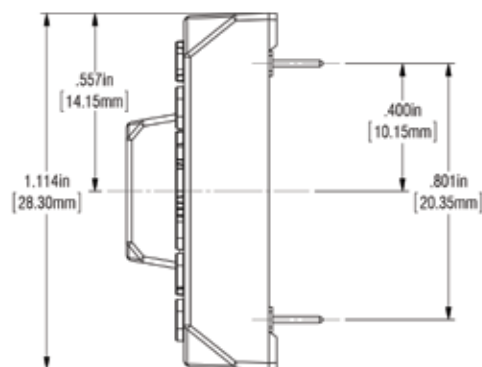
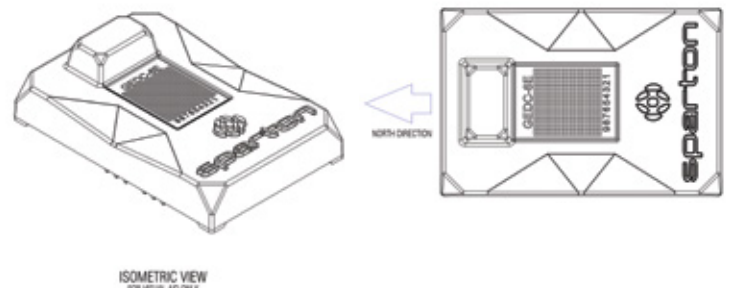
Features

- Integrated AdaptNav II™ adaptive algorithms provide real-time optimization of sensor performance when used in environments prone to mechanical vibrations and gyro saturation
- 2D and 3D adaptive in-field cal providing hard and soft magnetic interference compensation
- High dynamic heading accuracy enhanced by use of gyroscopes and fast sampling rate
- Simple 2-wire serial (UART) interface (3.3V logic level) with user-selectable baud rate
- Advanced sensing technology (3-axis magnetic, 3-axis MEMS acceleration, and 3-axis MEMS gyro)
- Built-in World Magnetic Model for accurate True North
- Rugged (epoxy encapsulated) construction and small physical size
- Magnetic and True North heading (yaw), pitch, and roll measurement
- Low power consumption and power management (Sleep mode) functionality
- NorthTek™ enabled
- Full 360° rollover capability
- In-field calibration point selection and distribution indicator
- Quality of in-field calibration indicator
- Centripetal acceleration correction

GEDC-6E

Typical Applications

- Pan and Tilt, Mapping
- Platform stabilization, positioning, and antenna pointing
- Weather, data, and ocean surveillance
- Electro-optical target designation systems
- Accurate vehicle attitude position and orientation sensing
- Precision autonomous unmanned vehicle guidance

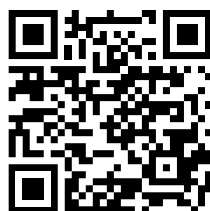
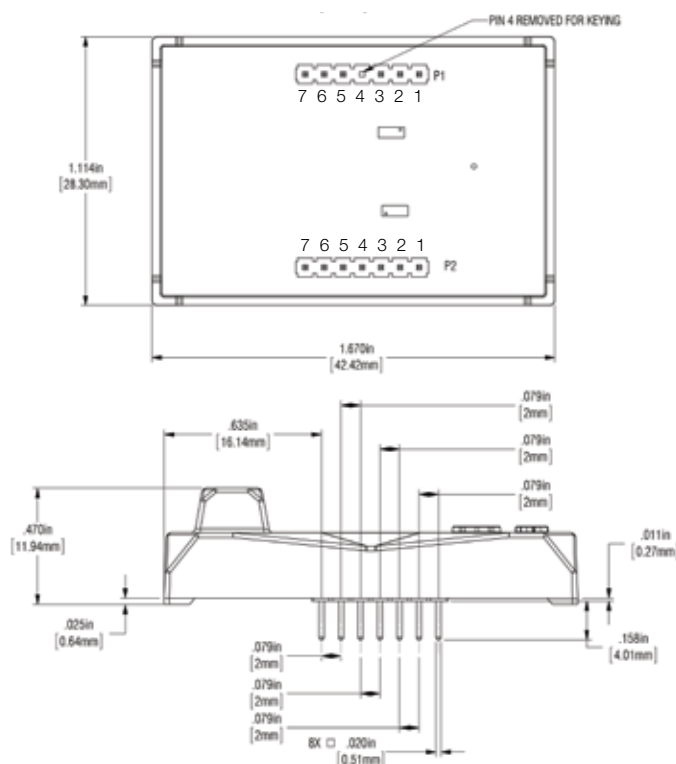


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NAVIGATION AND EXPLORATION

Specifications

Dynamic Heading Accuracy	1.0° RMS ¹
Static Heading Accuracy	0.3° RMS ²
Heading Repeatability	0.1° RMS
Dynamic Pitch/Roll Accuracy	1.0° RMS ¹
Static Pitch/Roll Accuracy	0.2° RMS
Pitch/Roll Repeatability	0.1° RMS
Pitch/Roll Range	± 90°, ± 180°
Accelerometer Range (Selectable) ²	+/- 4g (+/- 1g) ² Configurable to +/- 8g
Accelerometer Noise Density	126 µg/√Hz
Accelerometer Bias Stability	0.023 mg
Accelerometer Velocity Random Walk (VRW)	0.063 m/s
Gyro Dynamic Range (Selectable)	± 480°/sec (± 300°/sec) ³
Gyro Noise Density	0.03 dps/√Hz
Gyro Bias Stability	10.8°/Hr
Gyro Angular Random Walk (ARW)	1.5 deg/√Hr
Magnetic Range	± 1.2 gauss (± 900 milligauss) ³
Maximum Magnetic Inclination (Dip)	± 80° ⁴
Update Rate (Samples/Sec)	100
Baud Rate	0.3, 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbaud
Dimensions L x W x H	42 x 28 x 12 mm (1.66 x 1.11 x 0.43 inches)
Mass	16g
Encapsulated or Enclosure	Yes
Storage Temperature	-40° to +85° C
Operating Temperature	-40° to +85° C
Humidity Resistance	95%, 70° C, 240 hrs. Meets MIL-STD-202G – Method 103A, Test Condition A
Shock Resistance	1500g, 1ms Pulse, Half-Sine Wave Meets MIL-STD-202G – Method 213B, Test Condition F
Vibration Resistance	.06 dB Power Spectral Density, 9.26 G RMS Meets MIL-STD-202G – Method 214A, Test Condition I/C
Power Supply Input (Unregulated Voltage)	+4 to +10V DC
Input Power, Operating Mode (Typical @ 4V)	320 mW
Input Power, Sleep Mode (Typical @ 4v)	12 mW
3.3V Logic UART Interface	Yes
2D and 3D In-Field Calibration	Yes
Able To Maintain Function When Inverted	Yes
Quaternion/Rotation Matrix Output	Yes
True North Heading Output	Yes
NorthTek™ User Programmable Customizations	Yes
Pin Connectivity Gold Plating	Meets MIL-G-45204 Type III Class 4
Includes World Magnetic Model	Yes
RoHS Compliant	Yes

Pin #	Pin Name	I/O	Function
P1-1	V_TEST	O	3.3V regulator output for test purposes (factory use only)
P1-2	DEBUG_RXD	I	3.3V logic RXD Input to Debug Port (factory use only)
P1-3	DEBUG_TXD	O	3.3V logic TXD Output from Debug Port (factory use only)
P1-4		N/A	Pin removed for keying
P1-5	#WP_EE-PROM	I	3.3V logic, active-low EEPROM write protect (the pin has 10kΩ pull-down)
P1-6	Factory Use	I	Do not connect (factory use only)
P1-7	GND	N/A	System Ground
P2-1	V+	I	+4 to +10V DC power supply input. Max load = 80mA
P2-2	USER_RXD	I	3.3V logic RXD input to User Com Port
P2-3	USER_TXD	O	3.3V logic TXD output from User Com Port
P2-4	#RESET	I	3.3V logic, active-low reset input (the pin has a weak pull-up)
P2-5	#EINT0	I	3.3V logic, active-low interrupt input (the pin has a weak pull-up). Used for programming purposes
P2-6	GND	N/A	System Ground
P2-7	GND	N/A	System Ground



¹ Dynamic heading accuracy derived from Scorsby table set for 7 RPM, 30° of inclination.

² Performance data applies under the following conditions unless otherwise specified:

23°C, 0° Pitch/Roll, 300mGauss Horizontal and 0mGauss Vertical Magnetic Field.

³ Specifications in parentheses represent current limits of calibration methodology.

⁴ Performance at maximum dip angle will be degraded.

Specifications subject to change without notice.

For more information and detailed specifications scan QR code.

For support, please e-mail: productsupport@sparton.com

