Product Data Sheet

DC-4E

Tilt Compensated Attitude & Heading System

Description

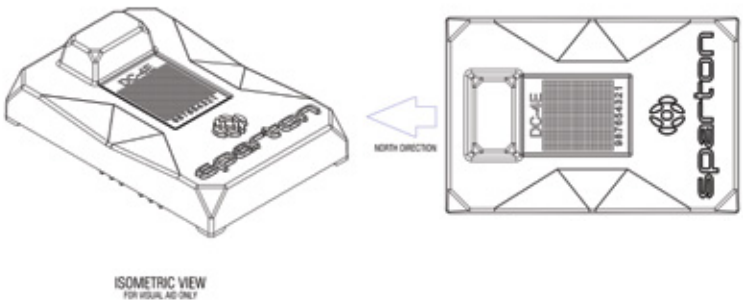
The Sparton DC-4E delivers superior performance by incorporating tri-axial magnetometers and accelerometers with highly optimized next generation software and advanced calibration algorithms. It offers best-in-class reliability, attitude and heading accuracy and provides 3-axis calibrated magnetic field measurements with full 360° tilt-compensated heading, pitch, and roll data. Proprietary adaptive in-field calibration algorithms provide accurate performance even in the presence of magnetic distortions due to ferrous objects positioned on the mounting platform. Furthermore, the DC-4E also incorporates the World Magnetic Model allowing it to provide a True North output at all locations around the globe.

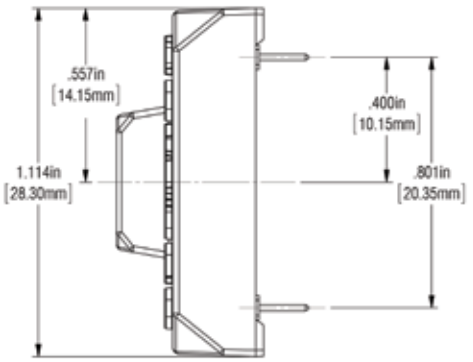
Features

- 2D and 3D adaptive in-field calibration providing hard and soft magnetic interference compensation
- Simple 2-wire serial (UART) interface (3.3V logic level) with user-selectable baud rate
- Built-in World Magnetic Model for accurate True North
- Advanced sensing technology (3-axis magnetic, 3-axis MEMS acceleration)
- Magnetic and True North heading (yaw), pitch, and roll measurement
- Low power consumption and power management (Sleep Mode) functionality
- Powerful user programmable customizations via NorthTek™ Forth interpreter
- Industry leading static accuracy and resolution
- Rugged (epoxy encapsulated) construction
- Supports multiple communication protocols
- Full 360° roll-over capability
- Small physical size
- In-field calibration point selection and distribution indicator
- Quality of in-field calibration indicator

Typical Applications

- Platform stabilization and positioning
- Pan and tilt, mapping and antenna pointing
- Heading and orientation
- Inclinometer





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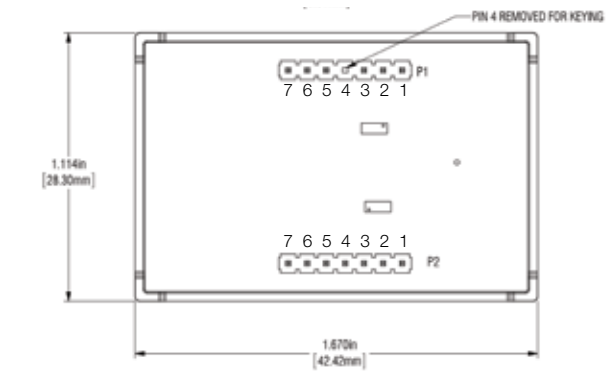
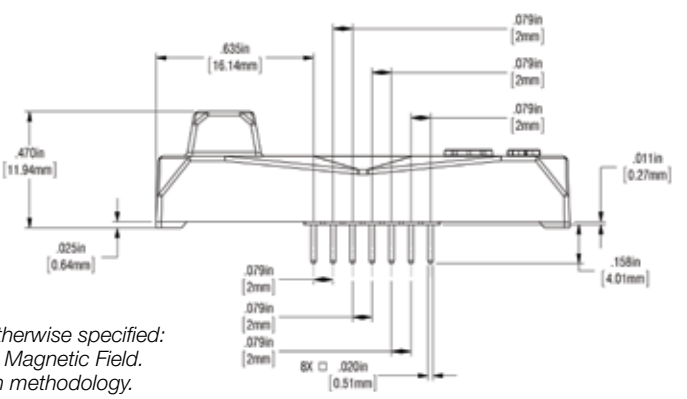
Specifications

Static Heading Accuracy	0.3° RMS[1]
Heading Repeatability	0.1° RMS
Static Pitch/Roll Accuracy	0.2° RMS
Pitch/Roll Repeatability	0.1° RMS
Pitch/Roll Range	± 90°, ± 180°
Accelerometer Range	+/- 4g (+/- 1g)[1] Configurable to +/- 8g
Accelerometer Noise Density	126 µg/√Hz
Accelerometer Bias Stability	0.023 mg
Accelerometer Velocity Random Walk	0.063 m/s
Magnetic Range	±1.2 Gauss (±900 MGauss)[2]
Maximum Magnetic Inclination (Dip)	± 80°[3]
Update Rate (Samples/Sec)	10
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
Operating Temp	-40° to +85° C
Storage Temp	-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)	132 mW
Input Power, Sleep Mode (Typical @ 4V)	14 mW
3.3V Logic UART Interface	Yes
3D In-Field Calibration	Yes
2D 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
Includes World Magnetic Model	Yes
Pin Connectivity Gold Plating	Meets MIL-G-45204 Type III Class 4
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 = 33mA
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] Performance data applies under the following conditions unless otherwise specified: 23°C, 0° Pitch/Roll, 300mGauss Horizontal and 0mGauss Vertical Magnetic Field.
[2] Specifications in parentheses represent current limits of calibration methodology.
[3] Performance at maximum dip angle will be degraded.
Specifications subject to change without notice.
Performance data applies to 23°C, 0° for Pitch/Roll unless otherwise specified.
For more information and detailed specifications scan QR code.
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