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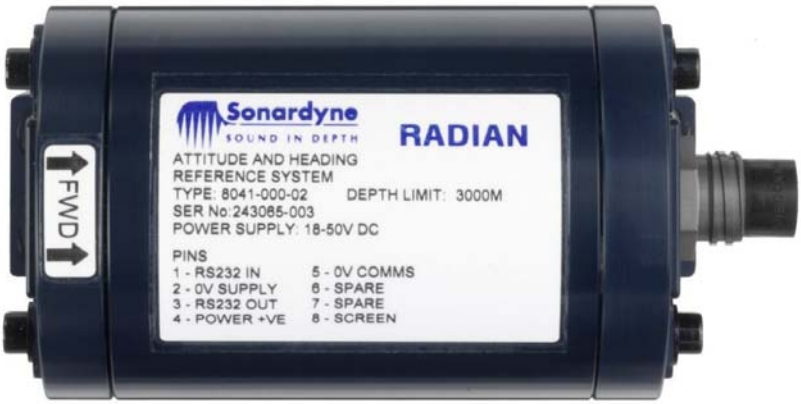
Datasheet

Radian – Miniature Attitude & Heading Reference System



Description

Radian is a miniature marine Attitude and Heading Reference Systems (AHRS) using a triad of modern high quality solid state MEMS inertial and earth magnetic field sensors.

The embedded processor allows the real-time output of high accuracy gyro compensated magnetic heading, pitch, roll and related information at high output rates to provide the user with an optimum orientation solution.

To correct for any local disturbances to the magnetic field caused by a vessels engines for example, a full magnetic field calibration can be carried out with easy to use software supplied. A correction table is then stored within the device.

The relative weighting between the magnetic heading sensor data and gyro data can be adjusted to enable absolute or relative heading output, dependent on the magnetic environment that it is installed in. The filter response can be adjusted to suit different vehicle dynamics.

Radian supports RS232, 485 with a range or proprietary or marine industry standard serial outputs. With the software supplied you can view the heading, pitch, roll data in real-time on a PC, or configure serial outputs to other systems.

Supplied within a 300 or 3,000 metre rated underwater pressure housing and accepting a wide range of input voltages, Radian can be mounted anywhere on vessels, ROVs, AUVs and other vehicles or structures.

Radian is compatible with Sonardyne's family of Scout USBL tracking systems.

Key Features

- Miniature affordable marine high accuracy magnetic heading, pitch, and roll sensor
- Surface or Subsea (300 or 3,000 Metre depth rating)
- Industry standard serial outputs
- Supplied with advanced software
- 18 to 50 Volt input range
- Low power consumption <450mW
- High update rate of 100Hz
- Low latency
- Suitable for highly dynamic conditions as gyro compensated
- Magnetic field calibration system provided

Applications

- Inshore hydrographic survey
- Vessels: Compensation of Bathymetry systems, Dynamic Position system input
- ROVs : Orientation displays, Imaging sonar compensation
- AUVs : Dead reckoning, Imaging sonar compensation

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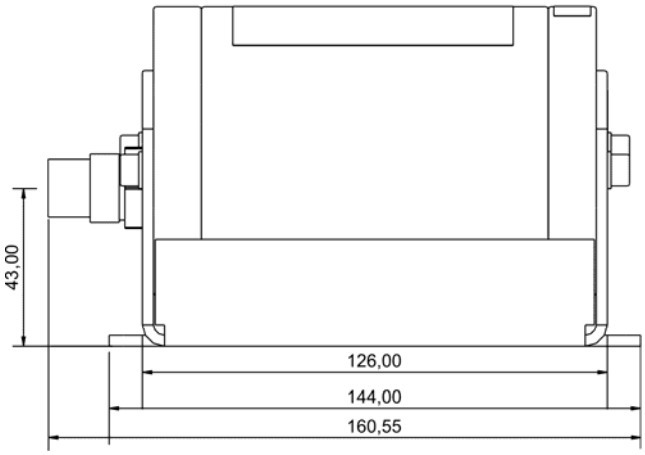
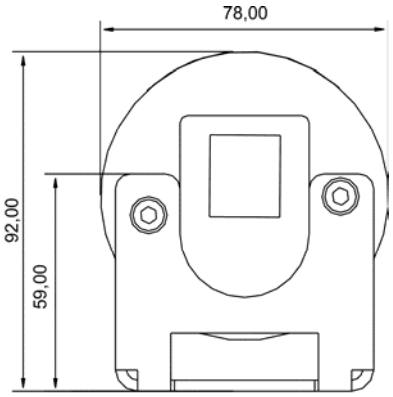
Specifications

Radian – Miniature Attitude & Heading Reference System





Feature	Type 8041-000-01	Type 8041-000-02
Depth Rating	300 Metres	3,000 Metres
Dimensions	160mm x 92mm x 78mm	160mm x 92mm x 78mm
Weight in Air/Water	0.64kg / 0.05kg	1.21kg / 0.61kg

Raw sensor performance

	Rate of Turn	Acceleration	Magnetic Field	Temperature
Full Scale (standard)	±150 deg/s	±50 m/s^2	±750 mGauss	-10 to +60°C
Linearity	0.1% of FS	0.2% of FS	0.2% of FS	<1% of FS
Bias stability (1σ)	5 deg/s	0.02 m/s^2	0.5 mGauss	0.5 °C accuracy
Scale Factor Stability (1σ)	-	0.05%	0.5%	-
Noise density	0.1 deg/s/√Hz	0.001 $m/s^2/\sqrt{Hz}$	0.5 mGauss (1σ)	-
Alignment error	0.1 deg	0.1 deg	0.1 deg	-
Bandwidth (standard)	40 Hz	30 Hz	10 Hz	-

Orientation performance in marine conditions

Dynamic range	All angles 3D
Angular resolution	0.05 Deg
Pitch Accuracy	<0.5 Deg
Roll Accuracy	<0.5 Deg
Heading Accuracy	<1 Deg Statically, <2 Deg in real marine environment

Interfacing

Proprietary Outputs	3D orientations (Quaternions, Euler Angles, Rotation Matrix), 3D acceleration, 3D rate of turn, 3D earth-magnetic field (normalized), Device Temperature
Industry Standard	$HCHDM, $HCHDG, TSS2, $PHTRO, $PRDID, EM1000
Max update rate	512Hz (sensors only), 100Hz (orientation data)
Digital interface	RS232, RS485
Operating voltage	18 to 50 VDC
Power consumption	450mWatts