

## Crista OEM Sensor Head

The Crista OEM Sensor Head is a small, solder down, three axis inertial sensor package available for direct integration into end user applications. It provides high bandwidth raw measurements from the MEMS gyroscopic rate sensors and accelerometers. Direct SPI interface is provided to the A/D converter and serial EEPROM containing gain, temperature calibration, and alignment correction data. The Crista OEM Sensor Head is also available as complete IMU assembly with a RS-232 serial interface.



Crista Sensor Head

### Key Features

- 16 Bit Resolution Data Conversion
- SPI interface to analog to digital converter and calibration EEPROM
- Three Axis Sensing, 300 deg/sec. rate and 10G acceleration
- Gyro and accelerometer diagnostic test modes
- Solder down inertial sensor for customer processor board

### Interface

- Serial Interface: SPI to AD and EEPROM
- Data Output Rate: 8 channels out at 10KHz
- Internal A/D Rate: 2 MHz SPI Clk

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## Specifications

<b>Electrical</b>	Supply Voltage	5.5 - 8 Volts
	Power	0.2 W (typical)
<b>Mechanical</b>	Size	1.10 inches x 1.15 inches x 0.59 inches
	Weight	7.0 grams (0.25 oz)
<b>Gyros</b>	Range	$\pm 300^\circ / \text{sec}$
	<sup>1</sup> Scale Factor Error	$< 3^\circ / \text{sec}$ (@ 25 °C)
	In-Run Bias Error	
	Fixed temperature	$< 0.2^\circ / \text{sec}$ (warmed up)
	Over temperature	$< 0.6^\circ / \text{sec}$
	Linear Acceleration Effects	$0.2^\circ / \text{sec} / \text{G}$ typical ; $1.5^\circ / \text{sec} / \text{G}$ max uncorrected
	Noise ( $1\sigma$ , no over-samples)	$< \pm 0.7^\circ / \text{sec}$
	<sup>2</sup> Cross Axis Rate Error	2.6 % uncorrected
	A/D Measurement Resolution	$0.0155^\circ / \text{sec}$
	Converted data rate resolution	$0.009^\circ / \text{sec}$ (max rate = $300^\circ / \text{sec}$ )
	Bandwidth	2 <sup>nd</sup> order LPF Fc=100 Hz.
	<b>Accelerometers</b>	Range
Scale Factor Error		$< 100 \text{ mG}$ ( $0.98 \text{ m/s}^2$ ) (@ 25 °C)
In-Run Bias Error		
Fixed temperature		$< 25 \text{ mG}$ ( $0.245 \text{ m/s}^2$ )
Over temperature		$< 51 \text{ mG}$ ( $0.500 \text{ m/s}^2$ )
Turn-on to Turn-on Bias		$< 30 \text{ mG}$ ( $0.295 \text{ m/s}^2$ )
Noise ( $1\sigma$ , no over-samples)		$< \pm 12 \text{ mG}$ ( $0.120 \text{ m/s}^2$ )
<sup>2</sup> Cross Axis Rate Error		2.6 % uncorrected (Includes alignment and off axis acceleration)
A/D Measurement Resolution		0.62 mG
Converted data rate resolution		0.30 mG (max rate = 10 G)
Bandwidth		Simple LPF, Fc=100 Hz
<b>Environmental</b>		Operating Temperature
	Max Acceleration	500 G

- 1 Based on room ambient temperature. Nonlinearity from best fit straight line. Typically much better at lower rates/accelerations.
- 2 Includes alignment and off axis acceleration.