MicroStrain Product Datasheet

3DM-CX5-IMU

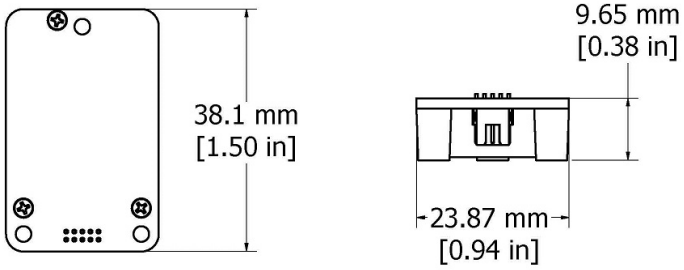
Inertial Measurement Unit

The MicroStrain Sensing 3DM-CX5 family of high-performance, industrial-grade, board-level inertial sensors provides a wide range of triaxial inertial measurements, computed attitude, and navigation solutions.

In all models, the Inertial Measurement Unit (IMU) includes direct measurement of acceleration and angular rate, and is fully temperature-compensated and calibrated over the operating temperature range. The use of Micro-Electro-Mechanical System (MEMS) technology allows for highly accurate, small, lightweight devices.

SensorConnect software is a user friendly program for device configuration. MIP Monitor (MicroStrain Internet Protocol) can also be used. Both packages provide for device configuration, live data monitoring, and recording. Alternatively, the MIP Data Communications Protocol is available for development of custom interfaces and easy OEM integration.

The sensor operates independent of computer platform, operating system, or coding language.



PRODUCT HIGHLIGHTS

- Triaxial accelerometer, gyroscope, temperature sensors achieve the optimal combination of measurement qualities
- Smallest, lightest, highest performance IMU in its class

FEATURES AND BENEFITS

BEST IN CLASS PERFORMANCE

- Fully calibrated, temperature-compensated, and mathematically-aligned to an orthogonal coordinate system for highly accurate outputs
- High-performance, low-drift gyros with low noise density and vibration rectification error.
- Accelerometer noise as low as 20 ug/√Hz

EASE OF USE

- SensorConnect enables simple device configuration, live data monitoring and recording.
- Optional hardware communications-development kit available.
- The MSCL API allows easy integration with C++, Python, .NET, C#, Visual Basic, LabVIEW and MATLAB environments.
- MIP open byte level communication protocol

COST EFFECTIVE

- Out-of-the box solution reduces development time
- Volume discounts

APPLICATIONS

- Unmanned vehicles
- Robotics
- Platform stabilization, artificial horizon
- Health and usage monitoring of vehicles

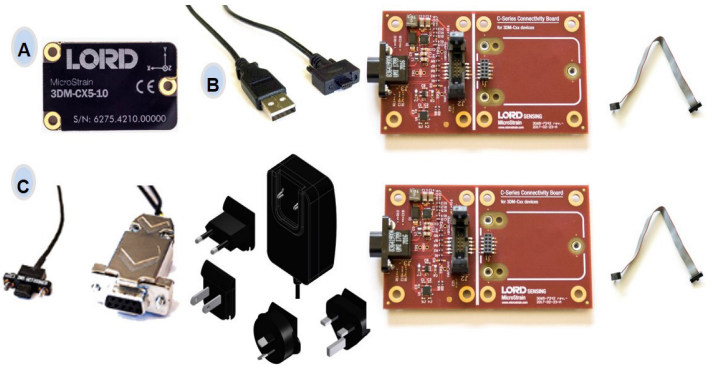
Inertial Measurement Unit

Specifications

General		
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, and temperature sensors	
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, delta theta, delta velocity	
Inertial Measurement Unit (IMU) Sensor Outputs		
	Accelerometer	**Gyroscope**
Measurement range	±8 g (standard) ±2 g, ±4 g, ±20 g, ±40 g (optional)	300°/sec (standard) ±75, ±150, ±900°/sec (optional)
Non-linearity	±0.02% fs	±0.02% fs
Resolution	0.02 mg (+/- 8 g)	<0.003°/sec (300 degrees/second)
Bias instability	±0.04 mg	8°/hr
Initial bias error	±0.002 g	±0.04°/sec
Scale factor stability	±0.03%	±0.05%
Noise density	20 µg/√Hz (2 g)	0.005°/sec/√Hz (300°/sec)
Alignment error	±0.05°	±0.05°
Adjustable bandwidth	225 Hz (max)	250 Hz (max)
Offset error over temperature	0.06% (typ)	0.04% (typ)
Gain error over temperature	0.03% (typ)	0.03% (typ)
Scale factor non-linearity (@ 25°C)	0.02% (typ) 0.06% (max)	0.02% (typ) 0.06% (max)
Vibration induced noise	--	0.072°/s RMS/g RMS
(VRE) Vibration rectification error	0.03%	0.001°/s/g2 RMS
IMU filtering	Digital sigma-delta wide band anti-aliasing filter to digital averaging filter (user adjustable) scaled into physical units.	
Sampling rate	1 kHz	4 kHz
IMU data output rate	1 Hz to 1000 Hz	

Operating Parameters	
Communication	TTL serial (3.0 V dc, 9,600 bps to 921,600 bps, default 115,200)
Power source	+ 3.2 to 5.2 V dc
Power consumption	300 mW (typ)
Operating temperature	-40°C to +85°C
Mechanical shock limit	500*g*/1ms absolute maximum survivability.*
Physical Specifications	
Dimensions	38 mm x 24 mm x 9.7 mm
Weight	8 grams
Enclosure material	Aluminum
MTBF	400,094 hours (Telcordia method, GM/35C)
Regulatory compliance	CE, REACH, ROHS
Integration	
Connectors	Data/power: FTSH Series Connectivity kit: Micro-D9
Software	SensorConnect and MIP Monitor software included; Windows XP/Vista/7/8/10 compatible
Data Communications Protocol (DCP)	Protocol compatibility across GX3, GX4, RQ1, GQ4, GX5 CX5 and CV5 product families
Software development kit	MicroStrain Communication Library (MSCL) open source license includes full documentation and sample code.
Hardware development kit	Available option

*Prolonged exposure to >2x full scale range can result in permanent damage. See manual for details



Parker Hannifin Corporation
MicroStrain Sensing
459 Hurricane Lane
Williston, VT 05495 • USA

phone: +1.802.862.6629
email: sensing_sales@LORD.com
sensing_support@LORD.com
www.microstrain.com
www.parker.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

MicroStrain by HBK:

3DM-CX5-10 3DM-CX5-IMU