PRODUCT DATA SHEET

3DM-CV5-IMU: Inertial Measurement Unit

The 3DM-CV5 family of 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, angular rate, delta theta, and delta velocity. Compensation options include automatic compensation for magnetic anomalies, gyro and accelerometer noise, and noise effects. In models that include computed outputs, sensor measurements are processed through and auto-adaptive estimation filter algorithm to produce high accuracy computed outputs under dynamic conditions. The computed outputs vary between models and can include roll, pitch, and yaw. All sensors are fully temperature-compensated and calibrated over the operating temperature range. The use of Micro-Electro-Mechanical Systems (MEMS) technology allows for highly accurate, small, light-weight devices.

SensorConnect software is a user friendly program for device configuration. MIP Monitor (MicroStrain Inertial 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

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

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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 vibrational rectification error
- Direct PCB mount or chassis mount with ribbon cable
- Precision mounting alignment features

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 pricing available

APPLICATIONS

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

MICROSTRAIN 3DM-CV5-IMU 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

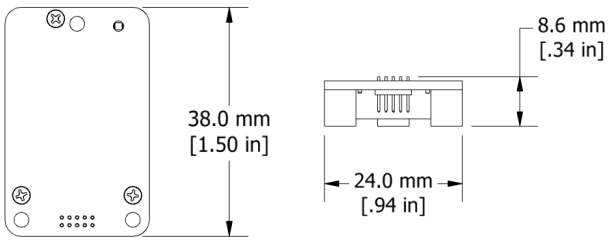
Inertial Measurement (IMU) Sensor Outputs		
	Accelerometer	**Gyroscope**
Measurement Range	±8 g (standard) ±2 g, ±4 g, ±20 g, ±40 g (optional)	±500°/sec (standard) ±250°, ±1000°/sec (optional)
Non-linearity	±0.04% fs	±0.06% fs
Resolution	0.05 mg (+/- 8 g)	<0.003°/sec (500 dps)
Bias instability	±0.08 mg	8°/hr
Initial bias error	±0.004 g	±0.01°/sec
Scale factor stability	±0.05%	±0.05%
Noise density	100 µg/√Hz (2 g)	0.0075°/sec/√Hz (500°/sec)
Alignment error	±0.05°	±0.08°
Adjustable Bandwidth	225 Hz (max)	500 Hz (max)
Offset error over temperature	0.02% (typ)	0.01% (typ)
Gain error over temperature	0.05% (typ) ±0.2% (max)	0.1% (typ) ±0.4% (max)
Sampling rate	1 kHz	1 kHz
IMU Filtering	First stage sigma delta Analog to Digital Converter sampled at 1 kHz. Second stage user adjustable digital low pass filter.	
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	360 mW (typ), 500 mW (max)
Operating temperature	-40°C to +85°C
Mechanical shock limit	500g/1ms absolute maximum survivability.*
MTBF	1,035,471 hours (Telcordia method gm/35C)

Physical Specifications	
Dimensions	38 mm x 24 mm x 9.7 mm
Weight	11 grams
Enclosure material	Aluminum
Regulatory compliance	CE, RoHS

Intregration	
Connectors	Data/power output: Samtec FTSH Series. Connectivity board: 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 (SDK)	MicroStrain Communication Library (MSCL) open source license includes full documentation and sample code.
Hardware development kit	Option purchased separately

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



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