

MicroStrain Product Datasheet

3DM-CX5-GNSS/INS

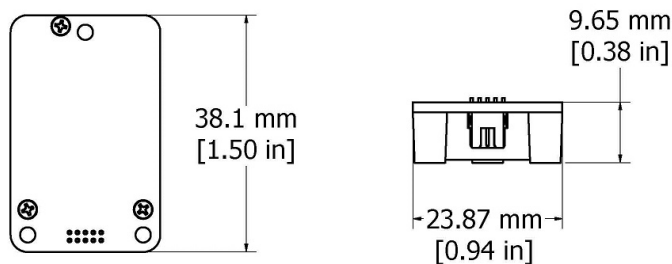
GNSS Aided Inertial Navigation System



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

The 3DM-CX5-GNSS/INS all-in-one navigation solution features a high-performance, integrated multi-constellation GNSS receiver utilizing the GPS, GLONASS, BeiDou, and Galileo satellite constellations. Sensor measurements are fully calibrated, temperature-compensated, and mathematically-aligned to an orthogonal coordinate system for highly accurate outputs. The auto-adaptive estimation filter algorithm produces highly accurate computed outputs under dynamic conditions. Compensation options include automatic compensation for magnetic anomalies, gyro and accelerometer noise, and noise effects. The computed outputs include pitch, roll, yaw, heading, position, velocity, and GNSS outputs- making it a complete GNSS/INS (GNSS Aided Inertial Navigation System) solution. Micro-Electro-Mechanical Systems (MEMS) technology provides a highly accurate, small, light-weight device.

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

- High-performance integrated multi-constellation GNSS receiver and advanced MEMS sensor technology provide direct inertial measurements, outputs in a small package
- Triaxial accelerometer, gyroscope, magnetometer, temperature sensors, and a pressure altimeter achieve the optimal combination of measurement qualities
- Dual on-board processors run a new Auto-Adaptive Extended Kalman Filter (EKF) for outstanding dynamic position, velocity, and attitude estimates

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 $\mu\text{g}/\sqrt{\text{Hz}}$

EASE OF USE

- Sensor Connect enables simple device configuration, live data monitoring and recording
- Optional hardware 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
- Automatic magnetometer calibration and anomaly rejection eliminates the need for field calibration
- Automatically compensates for vehicle noise and vibration

COST EFFECTIVE

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

APPLICATIONS

- Unmanned vehicle navigation
- Robotics
- GNSS-aided navigation system
- Platform stabilization, artificial horizon
- Satellite dish, radar, and antenna pointing



ENGINEERING YOUR SUCCESS.

©2020 Parker Hannifin MicroStrain Sensing. | Document 8400-0118 Revision G. | Subject to change without notice.

GNSS Aided Inertial Navigation System

Specifications

General				Computed Outputs	
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, triaxial magnetometer, pressure altimeter, temperature sensors, and GNSS receiver			Position accuracy	±2 m RMS horizontal, ± 5 m RMS vertical (typ)
				Velocity accuracy	±0.1 m/s RMS (typ)
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, magnetic field, ambient pressure, Delta-theta, Delta-velocity Computed outputs Extended Kalman Filter (EKF): filter status, GNSS timestamp, LLH position, NED velocity, attitude estimates (in Euler angles, quaternion, orientation matrix), linear and compensated acceleration, bias compensated angular rate, pressure altitude, gyroscope and accelerometer bias, scale factors and uncertainties, gravity and magnetic models, and more. Complementary Filter (CF): attitude estimates (in Euler angles, quaternion, orientation matrix) stabilized, north and up vectors, GNSS correlation timestamp Global Positioning System outputs (GPS) Global Navigation Satellite System outputs (GNSS): LLH position, ECEF position and velocity, NED velocity, UTC time, GNSS time, SV.GNSS protocol access mode available.			Attitude accuracy	EKF outputs: ±0.25° RMS roll and pitch, ±0.8° RMS heading (typ) CF outputs: ±0.5° RMS roll, pitch, and heading (static, typ), ±2.0° roll, pitch, (dynamic, typ)
				Attitude heading range	360° about all axes
				Attitude resolution	< 0.01°
				Attitude repeatability	0.2° (typ)
				Calculation update rate	500 Hz
				Computed data output rate	EKF outputs: up to 500 Hz CF oututs: up to 500 Hz
Global Navigation Satellite System (GNSS) Outputs					
Receiver type		72-channel GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1, SBAS L1 C/A:WAAS, EGNOS, MSAS Galileo E1B/C			
GNSS data output rate		1 Hz to 4 Hz			
Time-to-first-fix		Cold start: 27 second, reacquisition: 1 second hot start: <1 second			
Sensitivity		Tracking: -164 dBm, cold start: -147 dBm hot start: - 156 dBm			
Velocity accuracy		0.1 m/sec			
Heading accuracy		0.5°			
Horizontal position accuracy		GNSS: 2.5 m CEP SBAS: 2.0 m CEP			
Time pulse signal accuracy		30 nsec RMS < 60 nsec 99%			
Acceleration limit		≤ 4 g			
Altitude limit		50,000 meters			
Velocity limit		500 m /sec (972 knots)			
Operating Parameters					
Communication		USB 2.0 (full speed) 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		500 mW (typ)			
Operating temperature		-40°C to +85°C			
Mechanical shock limit		500g/1ms absolute maximum survivability.*			
MTBF		400,094 hours (Telcordia method, GM/35C)			
Physical Specifications					
Dimensions		38 mm x 24 mm x 9.7 mm			
Weight		8 grams			
Enclosure material		Aluminum			
Regulatory compliance		CE, REACH, ROHS			
Integration					
Connectors		Data/power: Samtec FTSH Series GNSS antenna: MMCX type 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 (SDK)		MicroStrain Communication Library (MSCL) open source license includes full documentation and sample code.			

Inertial Measurement Unit (IMU) Sensor Outputs			
	Accelerometer	Gyroscope	Magnetometer
Measurement range	±8 g (standard) ±2 g, ±4 g, ±20 g, ±40 g (optional)	300°/sec (standard) ±75, ±150, ±900 (optional)	±8 Gauss
Non-linearity	±0.02% fs	±0.02% fs	±0.3% fs
Resolution	0.02 mg (+/- 8 g)	<0.003°/sec (300 dps)	--
Bias instability	±0.04 mg	8°/hr	--
Initial bias error	±0.002 g	±0.04°/sec	±0.003 Gauss
Scale factor stability	±0.03%	±0.05%	±0.1%
Noise density	20 µg/√Hz (2 g)	0.005°/sec/√Hz (300°/sec)	400 µGauss/√Hz
Alignment error	±0.05°	±0.08°	±0.05°
Adjustable bandwidth	225 Hz	250 Hz	--
Offset error over temperature	0.06% (typ)	0.04% (typ)	--
Gain error over temperature	0.03% (typ)	0.03% (typ)	--
Vibration induced noise	--	0.072°/s RMS/g RMS	--
(VRE) Vibration rectification error	--	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	100 Hz
IMU data output rate	1 Hz to 500 Hz (standard mode) 1 Hz to 1000 Hz (sensor direct mode)		
Pressure Altimeter			
Range	-1400 m to 10,000 m (1260-260 hPa)		
Resolution	0.01 hPa RMS		
Relative Accuracy	± 0.1 hPa over the range 800-1000 hPa @ T= 25°C		
Sampling rate	25 Hz		

* Note: Repeated exposure to > 2x full scale can result in permanent damage.



ZSE ELECTRONIC MESS-SYSTEME & SENSORTECHNIK GmbH
 Postfach 1830 ■ 74308 Bietigheim-Bissingen
 Telefon: 071 42 6845 ■ Fax: 071 42 6997
 e-mail: info@zse.de ■ www.zse.de

MicroStrain Product Datasheet

3DM-CX5-AHRS

Attitude & Heading Reference System

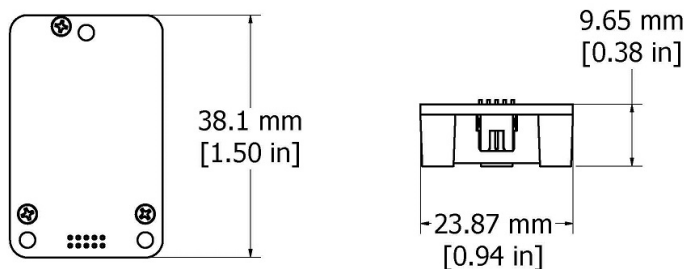


The MicroStrain Sensing 3DM-CX5 family of high-performance, industrial-grade, board-level inertial sensors provides a wide range of triaxial inertial measurements, computed attitude, and navigation solutions.

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
- Dual on-board processors run a new Auto-Adaptive Extended Kalman Filter (EKF) for outstanding dynamic roll, pitch, and yaw performance

FEATURES AND BENEFITS

BEST IN CLASS PERFORMANCE

- Bias tracking, error estimation, threshold flags, and adaptive noise modeling allow for fine tuning to conditions in each application
- Accelerometer noise as low as 20 $\mu\text{g}/\sqrt{\text{Hz}}$
- Smallest and lightest industrial AHRS with Adaptive Kalman Filter available

EASE OF USE

- Sensor Connect enables simple device configuration, live data monitoring and recording
- 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
- Automatic magnetometer calibration and anomaly rejection eliminates the need for field calibration
- Automatically compensates for vehicle noise and vibration

COST EFFECTIVE

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

APPLICATIONS

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



ENGINEERING YOUR SUCCESS.

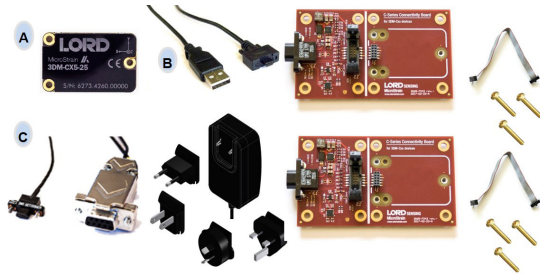
©2020 Parker Hannifin MicroStrain Sensing. | Document 8400-0116 Revision F. | Subject to change without notice.

Attitude & Heading Reference System

Specifications

General				Pressure Altimeter	
Integrated sensors	Triaxial accelerometer, triaxial gyroscope, and temperature sensors			Range	-1800 m to 10,000 m
Data outputs	Inertial Measurement Unit (IMU) outputs: acceleration, angular rate, magnetic field, ambient pressure, Delta-theta, Delta-velocity Computed outputs Extended Kalman Filter (EKF): filter status, timestamp, attitude estimates (in Euler angles, quaternion, orientation matrix), linear and compensated acceleration, bias compensated angular rate, pressure altitude, gravity-free linear acceleration, gyroscope and accelerometer bias, scale factors and uncertainties, gravity and magnetic models, and more.			Resolution	< 0.1 m
				Noise density	0.01 hPa RMS
				Sampling rate	25 Hz
				Computed Outputs	
				Attitude accuracy	EKF outputs: ±0.25° RMS roll and pitch, ±0.8° RMS heading (typ) CF outputs: ±0.5° RMS roll and pitch, ±1.5° RMS heading (typ)
				Attitude heading range	360° about all axes
	Attitude resolution	< 0.01°			
	Attitude repeatability	0.2° (typ)			
Inertial Measurement Unit (IMU) Sensor Outputs				Calculation update rate	500 Hz
	Accelerometer	Gyroscope	Magnetometer	Computed data output rate	EKF outputs: 1 Hz to 500 Hz CF outputs: 1 Hz to 1000 Hz
Measurement range	±8 g (standard) ±2 g, ±4 g, ±20 g, ±40 g (optional)	300°/sec (standard) ±75, ±150, ±900 (optional)	±8 Gauss	Operating Parameters	
Non-linearity	±0.02% fs	±0.02% fs	±0.3% fs	Communication	USB 2.0 (full speed) TTL serial (3.0 V dc, 9,600 bps to 921,600 bps, default 115,200)
Resolution	<0.1 mg	<0.003°/sec	--	Power source	+ 3.2 to 5.2 V dc
Bias instability	±0.04 mg	8°/hr	--	Power consumption	500 mW (typ)
Initial bias error	±0.002 g	±0.04°/sec	±0.003 Gauss	Operating temperature	-40°C to +85°C
Scale factor stability	±0.03%	±0.05%	±0.1%	Mechanical shock limit	500g/1ms absolute maximum survivability.*
Noise density	20 µg/√Hz (2 g)	0.005°/sec/√Hz (300°/sec)	400 µGauss/√Hz	Physical Specifications	
Alignment error	±0.05°	±0.05°	±0.05°	Dimensions	38 mm x 24 mm x 9.7 mm
Adjustable bandwidth	225 Hz (max)	250 Hz (max)	--	Weight	8 grams
Offset error over temperature	0.06% (typ)	0.04% (typ)	--	Enclosure material	Aluminum
Gain error over temperature	0.03% (typ)	0.03% (typ)	--	MTBF	400,094 hours (Telcordia method GM35C)
Scale factor non-linearity (@ 25°C)	0.02% (typ) 0.06% (max)	0.02% (typ) 0.06% (max)	±0.0015 Gauss	Regulatory compliance	CE, REACH, ROHS
Vibration induced noise	--	0.072°/s RMS/g RMS	--	Integration	
Vibration rectification error (VRE)	0.03%	0.001°/s/g2 RMS	--	Connectors	Data/power: Samtec FTSH Series Connectivity kit: Micro-D9
IMU filtering	Digital sigma-delta wide band anti-aliasing filter to digital averaging filter (user adjustable) scaled into physical units.			Software	SensorConnect and MIP Monitor software included; Windows XP/ Vista/7/8/10 compatible
Sampling rate	1 kHz	4 kHz	100 Hz	Data Communications Protocol (DCP)	Protocol compatibility across GX3, GX4, RQ1, GQ4, GX5 CX5 and CV5 product families
IMU data output rate	1 Hz to 1 kHz			Software development kit	MicroStrain Communication Library (MSCL) open source license includes full documentation and sample code.
				Hardware development kit	Available option

* Note: Repeated exposure to > 2x full scale can result in permanent damage.



MicroStrain Product Datasheet

3DM-CX5-VRU

Vertical Reference Unit

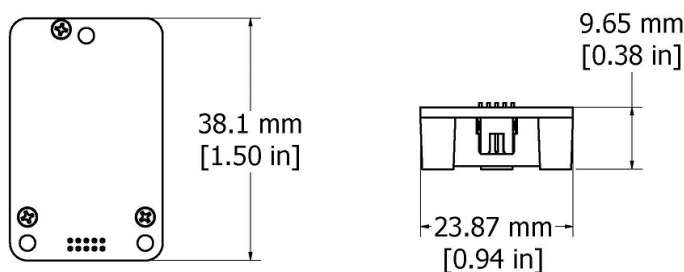


The MicroStrain Sensing 3DM-CX5 family of high-performance, industrial-grade, board-level inertial sensors provides a wide range of triaxial inertial measurements, computed attitude, and navigation solutions.

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
- Dual on-board processors run a new Auto-Adaptive Extended Kalman Filter (EKF) for outstanding dynamic roll, pitch, and yaw performance
- 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
- Bias tracking, error estimation, threshold flags, and adaptive noise modeling allow for fine tuning to conditions in each application
- High-performance, low-drift gyros with low noise density and vibration rectification error
- Accelerometer noise as low as 20 $\mu\text{g}/\sqrt{\text{Hz}}$

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

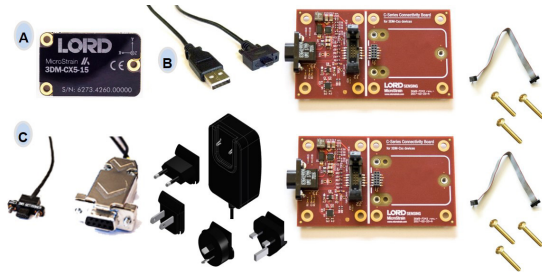
Vertical Reference Unit

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
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
Vibration rectification error (VRE)	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	
Pressure Altimeter		
Range	-1800 m to 10,000 m	
Resolution	< 0.1 m	
Noise density	0.01 hPa RMS	
Sampling rate	25 Hz	

Computed Outputs	
Attitude accuracy	EKF outputs: ±0.25° RMS roll and pitch (typ) CF outputs: ±0.5° roll and pitch (static, typ) and ±2.0° roll and pitch (dynamic, typ)
Attitude heading range	360° about all axes
Attitude resolution	< 0.01°
Attitude repeatability	0.2° (typ)
Calculation update rate	500 Hz
Computed data output rate	EKF outputs: 1 Hz to 500 Hz CF outputs: 1 Hz to 1000 Hz
Operating Parameters	
Communication	USB 2.0 (full speed) 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	500 mW (typ)
Operating temperature	-40°C to +85°C
Mechanical shock limit	500g/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: Samtec 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	Option purchased separately

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



MicroStrain Product Datasheet

3DM-CX5-IMU

Inertial Measurement Unit

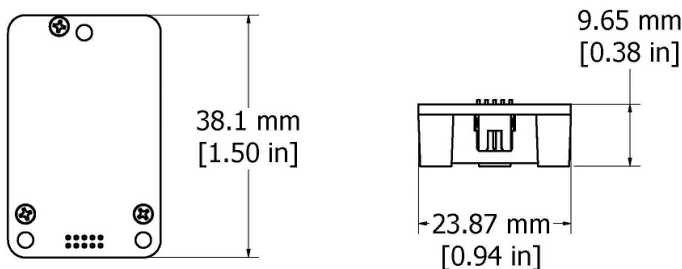


The MicroStrain Sensing 3DM-CX5 family of high-performance, industrial-grade, board-level inertial sensors provides a wide range of triaxial inertial measurements, computed attitude, and navigation solutions.

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/ $\sqrt{\text{Hz}}$

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



ENGINEERING YOUR SUCCESS.

©2020 Parker Hannifin MicroStrain Sensing. | Document 8400-0114 Revision F. | Subject to change without notice.

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/g ² 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	500g/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

