MicroStrain® Little Sensors, Big Ideas®

Inertial Sensors Comparison

Specifications				
				

Model	3DM-GX3® -45	3DM-GX3® -35	3DM-GX3® -25	3DM-GX3® -25 OEM
AHRS SPECIFICATIONS (Attitude and Heading)				
Attitude heading range	360° about all axes			
Accelerometer range	± 5 *g* standard			
Gyro range	± 300°/sec standard			
Static accuracy	±0.5° pitch, roll, heading typical for static test conditions			
Dynamic accuracy	±2.0° pitch, roll, heading for dynamic (cyclic) test conditions and for arbitrary angles			
Long term drift	eliminated by complementary filter architecture			
Repeatability	0.2°			
Resolution	<0.1°			
Data output rate	IMU: 1 Hz to 1000 Hz, INS: 1 H to 100 Hz, GPS: 1 Hz to 4 Hz	AHRS: 1 Hz to 1,000 Hz, GPS: 1 Hz to 4 Hz	Up to 1000 Hz	Up to 1000 Hz
Filtering	sensors sampled at 30 kHz, digitally filtered (user adjustable) and scaled into physical units; coning and sculling integrals computed at 1 kHz	sensors sampled at 30 kHz, digitally filtered (user adjustable) and scaled into physical units; coning and sculling integrals computed at 1 kHz	sensors sampled at 30 kHz, digitally filtered (user adjustable) and scaled into physical units; coning and sculling integrals computed at 1 kHz	sensors sampled at 30 kHz, digitally filtered (user adjustable) and scaled into physical units; coning and sculling integrals computed at 1 kHz
Output Modes	acceleration, angular rate, magnetic field, deltaTheta, deltaVelocity, Euler angles, orientation matrix, quaternion, LLH position, NED velocity, GPS time, filter status, PVA estimate, PVA uncertainties, *attitude as:* quaternion, matrix, or Euler angles, gravity-free linear acceleration, bias-compensated angular rate	acceleration, angular rate, magnetic field, deltaTheta, deltaVelocity, Euler angles, orientation matrix, quaternion, LLH position, NED velocity, ECEF position and velocity, DOP data, UTC time, GPS time, clock info., GPS fix, and SVI; NMEA GPS protocol records and UBX GPS protocol records available in advanced mode	acceleration, angular rate, and magnetic field, deltaTheta and deltaVelocity, Euler angles, quaternion, rotation matrix	acceleration, angular rate, and magnetic field, deltaTheta and deltaVelocity, Euler angles, quaternion, rotation matrix
AHRS SPECIFICATIONS (General)				
A/D Resolution	16 bits SAR oversampled to 17 bits			
Interface options	USB 2.0 and RS232	USB 2.0 and RS232	USB 2.0 and RS232	USB 2.0 / TTL serial (3.3 volts)
Baud rate	9,600 bps to 921,600 bps (115,200 bps default)	9,600 bps to 921,600 bps (115,200 bps default)	115,200 bps to 921,600 bps	115,200 bps to 921,600 bps
Power supply voltage	+3.2 to +16 volts DC	+3.2 to +16 volts DC	+3.2 to +16 volts DC	3.1 to 5.5 volts
Power consumption	160 mA (typical) @ 5 volts with RS-232 and GPS lock	160 mA (typical) @ 5 volts with RS-232 and GPS lock	80 mA @ 5 volts with USB	80 mA @ 5 volts with USB
Connector	micro-DB9	micro-DB9	micro-DB9	Samtec FTSH-105-01-F-D-K
Operating temperature	-40℃ to +65℃	-40℃ to +65℃	-40℃ to +70℃	-40℃ to +70℃
Dimensions	44 mm x 24 mm x 14 mm - excluding mounting tabs, width across tabs 37 mm	44 mm x 24 mm x 14 mm - excluding mounting tabs, width across tabs 37 mm	44 mm x 24 mm x 11mm - excluding mounting tabs, width across tabs 37 mm	38 mm x 24 mm x 12 mm
Weight	23 grams	23 grams	18 grams	11.5 grams
ROHS	compliant			
Shock limit	500 *g*			
Software Utility	CD in starter kit (XP/Vista/Win7 compatible)			
Software development kit (SDK)	complete data communications protocol and sample code			

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IMU SPECIFICATIONS (all models)				
	Accelerometers	**Gyros**	**Magnetometers**	
Measurement range	±5 *g*	±300°/sec	±2.5 Gauss	
Non-linearity	±0.1 % fs	±0.03 % fs	±0.4 % fs	
In-run bias stability	±0.04 m*g*	18°/hr	—	
Initial bias error	±0.002 *g*	±0.25°/sec	±0.003 Gauss	
Scale factor stability	±0.05 %	±0.05 %	±0.1 %	
Noise density	80 µg/√Hz	0.03°/sec/√Hz	100 µGauss/√Hz	
Alignment error	±0.05 %	±0.05 %	±0.05 %	
User adjustable bandwidth	225 Hz max	440 Hz max	230 Hz max	
Sampling rate	30 kHz	30 kHz	7.5 kHz max	
GPS RECEIVER				
GPS receiver type	50 Channels, L1 frequency, GPS C/A Code, SBAS: WAAS, EGNOS, MSAS, GAGAN			
GPS solution update rate	Up to 4Hz			
Time-to-First-Fix	Cold Start (Autonomous): 36 sec; Warm Start (Autonomous): 36 sec Hot Start: < 1 sec			
GPS tacking and navigation sensitivity	-159 dBm			
GPS reacquisition sensitivity	-159 dBm			
GPS cold start (autonomous) sensitivity	-141 dBm			
GPS velocity accuracy	0.1m/sec			
GPS heading accuracy	0.5°			
GPS horizontal position accuracy	< 2.5m Autonomous, < 2.0m SBAS (CEP, stationary 24 hours, SEP 3.5m)			
GPS timepulse signal accuracy	30 nsec RMS, < 60 nsec 99 %			
GPS acceleration limit	≤ 4 *g*			
GPS altitude limit	no limit			
GPS velocity limit	500 m/sec (972 knots)			
GPS antenna connector	MMCX type			
NAVIGATION SPECIFICATIONS (Kalman Filter Performance)				
Typical position accuracy †	±2.5 m RMS horizontal ±5 m RMS vertical			
Typical velocity accuracy †	±0.1 m/s to ±0.75 m/s RMS (application and settings dependent)			
Typical attitude accuracy †	±0.35 deg RMS roll & pitch ±1.0 deg RMS heading			
Update rate	100 Hz			
Features	vehicle dynamics mode selection (portable/automotive/airborne) · user-defined sensor to vehicle frame transformation · antenna offset specification, bias enable/disable · internal magnetometer enable/disable · external GPS and heading sensor support · full world magnetic model			
OPTIONS				
Accelerometer Range	±1.7 *g*, ±16 *g*, ±50 *g*			
Gyroscope Range	±50°/sec, ±600°/sec, ±1200°/sec			

Call 802.862.6629 or visit us online at www.microstrain.com

Specifications are subject to change without notice.
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