PRODUCT DATA SHEET

MicroStrain 3DM-GQ7-GNSS/INS

Tactical Grade RTK-Enabled Navigation System

MICROSTRAIN 3DM-GQ7-GNSS/INS SPECIFICATIONS

The MicroStrain 3DM-GQ7-GNSS/INS is a complete RTK-enabled navigation solution featuring centimeter-level position accuracy.

The system includes dual multiband GNSS receivers, low-noise and low-drift MEMS inertial sensors, and a robust Adaptive Extended Kalman Filter (EKF).

MicroStrain sensors have set the standard for inertial sensor performance for over 20 years. The 3DM-GQ7-GNSS/INS continues to build upon that legacy and includes a host of new features that ensure optimum performance in even the most demanding applications.

MICROSTRAIN 3DM-GV7 SERIES KEY FEATURES

- 1.5°/h Gyro Bias Instability
- Dual Antenna GNSS Heading
- Centimeter Level Accuracy with RTK
- Adjustable Sampling Rates Up to 1 KHz
- Tactical Grade IMU
- Advanced Tightly-Coupled EKF
- Lightweight (78g) and Low Profile

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MICROSTRAIN 3DM-GQ7-GNSS/INS SERIES SPECIFICATIONS

System Performance

Position	
Single Point, Horizontal [1]	1.25 m
Single Point, Vertical [1]	2 m
RTK [1,2]	2 cm

Attitude	
Roll, Pitch	0.05°
Heading [3]	0.25°
Dynamic	
Velocity	0.05 m/s

IMU

	Accelerometer	Gyroscope	Magnetometer	Barometer
Range	±8 g	±300°/s	±8 Gauss	260 to 1260 mbar
Random Walk	20 µg/√Hz	0.15 °/√h	-	-
Bias Instability	5 µg	1.5 °/h	-	-
Noise Density	20 µg/√Hz	8.75 °/h/√Hz	-	-
Turn-on to Turn-on Bias [4]	50 µg	0.002 °/s	-	-
Bias Error Over Temperature	0.4 mg	0.03 °/s	-	-
Scale Factor Error Over Temperature	600 PPM	1000 PPM	-	-

Interface

Connector	2x Micro-D9
Communications Interface	2x RS-232, 2x USB
GNSS Antenna Ports	2x MMCX
I/O	4x GPIO
Output Data Rate (IMU and EKF)	1 to 1000 Hz
External Aiding Input	RTCM 3.1, GNSS, Odometer, Heading

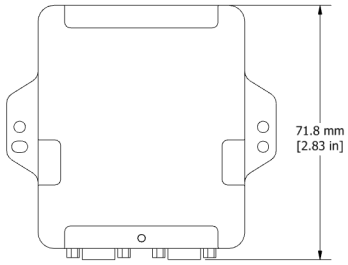
Physical and Electrical

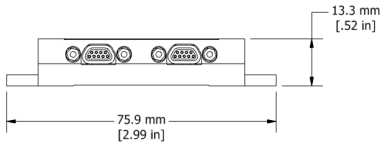
Weight	78 g
Size	76 mm x 68.6 mm x 13.3 mm
Power Consumption	2.0 W (Typ), 2.5 W (Max)
Operating Voltage	5 to 16 VDC
GPIO Voltage	5 V
Operating Temperature	-40°C to +85°C
Antenna Voltage Output	3 V
Antenna Output Current	100 mA
MTBF	389,237 hours (Telecordia Method, GM/35C)

GNSS

Number of Receivers	2
Channel Count	184
Constellations	GPS/GZSS, GLONASS, Galileo, BeiDou*, SBAS
Frequencies	L1C/A, L2C, L1OF, L2OF, E1B/C, E5b, B1, B2
Operational Limits	Altitude 50,000 meters, Velocity 500 m/s

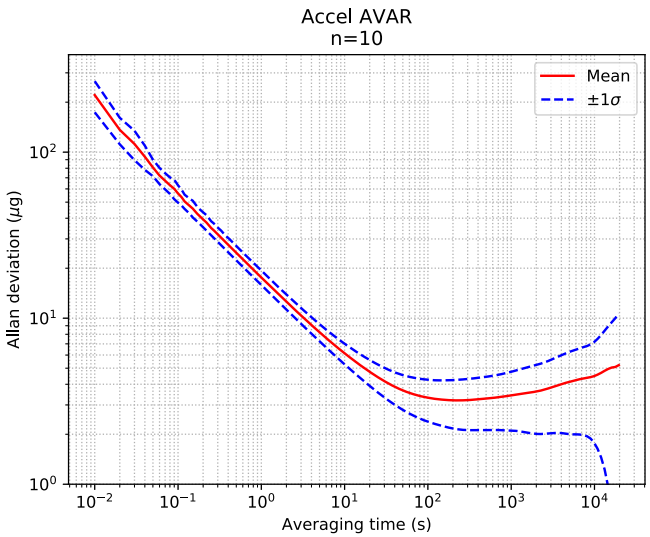
[*] BeiDou support to be provided in future firmware release

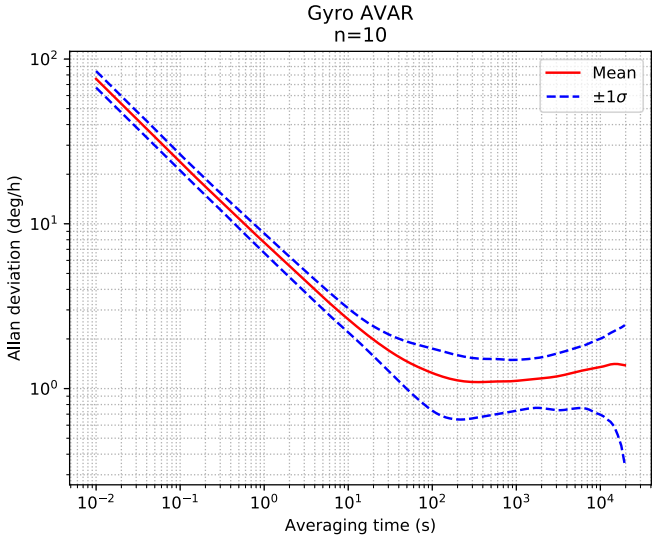




[1] 24 hour static, RMS
[2] 1 cm + 1 ppm, 2 cm at 10 km from base station
[3] Dual antenna, RMS, 1.5 m baseline
[4] Bias repeatability, <24 hours

MICROSTRAIN 3DM-GQ7-GNSS/INS SERIES ALLAN VARIANCE (AVAR)





MICROSTRAIN 3DM-RTK

Minimizing your time to market by removing the need for base station infrastructure

The MicroStrain 3DM-RTK Cellular Correction Modem transmits easy-to-use Real Time Kinematic (RTK) correction data to be utilized by the 3DM-GQ7-GNSS/INS. It provides the simplicity of a cellular connection to our SensorCloud RTK base station network, replacing cumbersome radio-based stations.

With RTK corrections the 3DM-GQ7 can achieve centimeter-level positional accuracy.

3DM-RTK Specifications	
Data Ouput Rate	1 Hz
Interface	Micro-D9, RS 232, USB
Protocols	MIP, RTCM 3.1, NMEA
Cellular Network	Cellular Coverage: Global*
Voltage	5 to 16 VDC
Power	1.0W (typical), 2.0W (max)
Weight	48g

[*] Some regional restrictions apply. Coverage only where LTE CAT-M1/2G deployment is available.

SensorConnect®

SensorConnect is PC software for sensor configuration and data collection. Configure inertial parameters, device settings, data channels, and sample rates.

Visualize massive amounts of data instantly using built-in intelligent data collection and graphing algorithms. Create immersive dashboards with rich data visualization.

MSCL™ API and MIP SDK

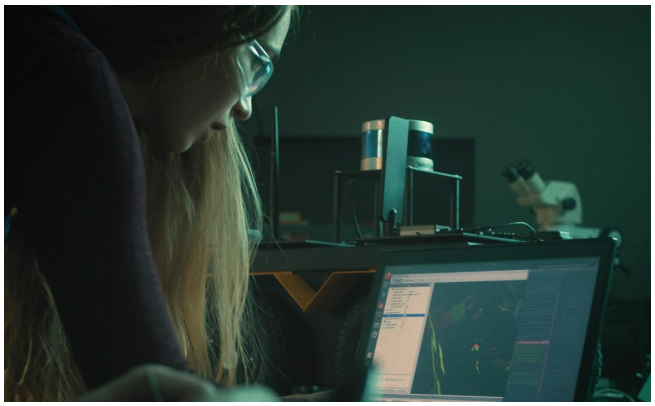
The MicroStrain Communication Library (MSCL) is our open-sourced API that simplifies writing code to interact with our sensors. MIP SDK is a lightweight C/C++ library for interacting with MicroStrain G and C-series products via baremetal and resource constrained microcontrollers.

Both APIs are readily available and fully-documented on GitHub, featuring valuable tools such as full documentation, example code, and a quick start guide.

MATLAB®

C++

python™



ROS

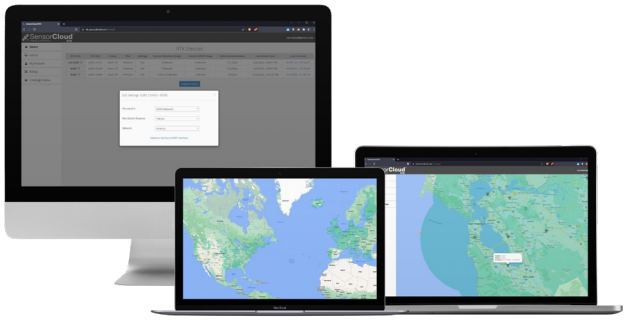
MicroStrain offers an open source, license-free (MIT License) series of actively supported drivers specifically designed and tested for Robot Operating System (ROS) and ROS2.

Use ROS for building and simulating robotics applications, unmanned ground vehicles (UGVs) and simultaneous localization and mapping (SLAM).

SensorCloud™ RTK

Seamless cloud-based network RTK corrections. Plug and play functionality with our 3DM-RTK modem allows for fast, easy deployment across the globe.

Get started instantly with our commitment-free subscription service, available immediately after registration.



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