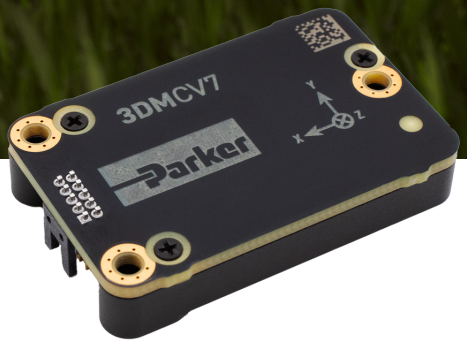


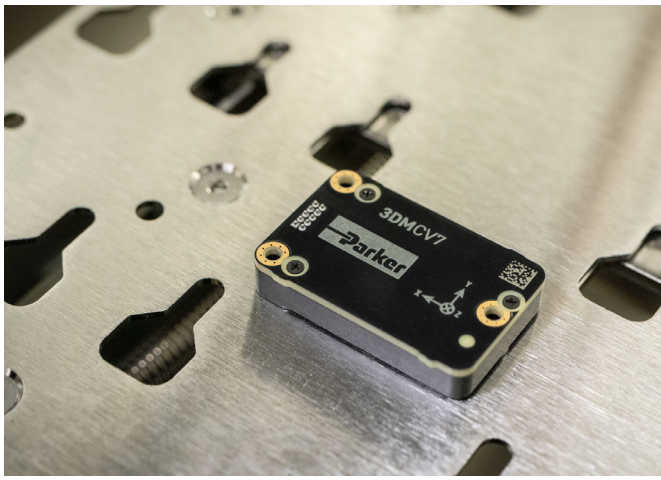
3DMCV7

High Performance OEM IMU/AHRS and IMU/AR

Parker

ENGINEERING YOUR SUCCESS.

3DMCV7 Overview



The **3DM**CV7 offers tactical grade inertial performance in the smallest and lightest OEM package yet. It is available in IMU/AHRS (attitude and heading reference system) and IMU/AR (attitude reference) options. Each **3DM**CV7 is individually calibrated for optimal performance over a wide range of operating conditions.

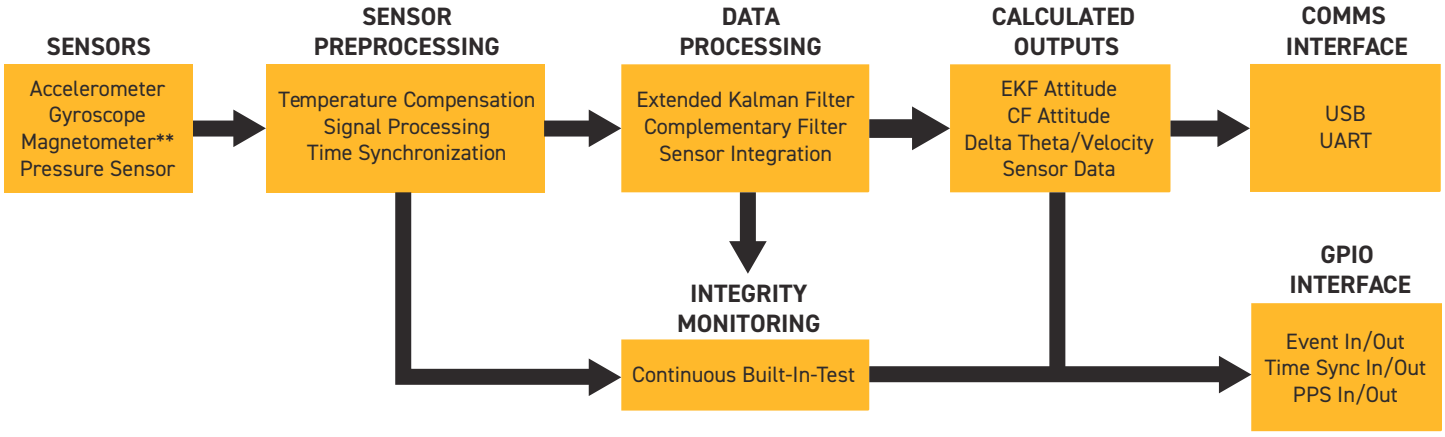
Parker's Auto-Adaptive Extended Kalman Filter has been designed from the ground up to deliver consistently reliable results in even the most challenging environments.

Cutting-edge orientation algorithms, advanced internal time management, and a flexible event triggering system put the **3DM**CV7 in a league of its own when it comes to price versus performance.

18% Thinner
20% Lighter
40% Less Power Consumption

- 1.5°/hr Gyro Bias Instability
- Low Latency
- Wide-Range Temperature Calibration
- Superior Vibration Rejection
- Extended Kalman Filter (EKF)
- Adjustable Sampling Rates (Up to 1KHz)
- Adjustable Range (Acccel & Gyro)
- External Clock Synchronization
- Custom Event Trigger System

3DMCV7 System Architecture



*Percentage improvement comparisons are relative to the **3DM**CV5.
** AHRS option only

3DMCV7 Key Features

Precision Timing

- Extensive time synchronization optimization for time alignment with external sensors, such as cameras or LiDAR
- Precision data timestamping and low latency output optimized for time-critical control applications
- 1 KHz output data rate for all channels

Extended Kalman Filter for Orientation Estimation

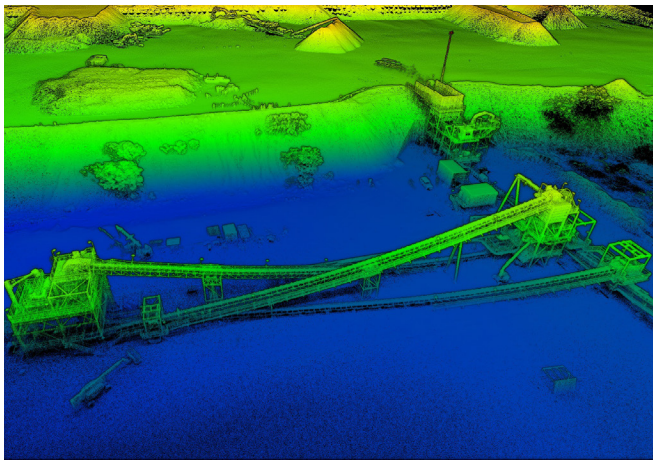
- Integrated vibration identification and rejection
- IMU bias error tracking improves performance over traditional complementary filters
- Reduces attitude error due to linear acceleration
- Integrated magnetometer allows for absolute heading tracking (AHRS-only)

IMU

- Tactical grade gyro (1.5°/hour bias instability)
- User-adjustable gyro and accel ranges
- Calibrated over full temperature range
- Complete digital calibration report available for each unit
- Continuous Built-In-Test for integrity monitoring

Integration

- Factory supported ROS1 and ROS2 driver
- Multi-language (C++, Python, Matlab, LabVIEW) software communications library simplifies custom software development
- Connectivity kit and USB support allows for rapid prototyping



SWaP-C

- Smaller size, lower power than previous generations
- Optimized for low cost, volume production OEM applications
- Aluminum mounting frame improves performance over solder-down modules by isolating sensitive MEMS components from board stresses

3DMCV7 Specifications

IMU

	Accelerometer	Gyroscope
Range (user-selectable)	±: 4g, 8g, 16g	±: 250°/s, 500°/s, 1000°/s
Random walk	30 µg/√Hz	.14°/√hr
Bias instability	18 µg	1.5°/h
Gain temperature hysteresis	125 ppm	1000 ppm
Bias temperature hysteresis	0.6 mg	0.04°/s
Bias repeatability[1]	40 µg	0.004°/s

Interface

Connector	Samtec FTS-105 (2x5)
Communications interface	UART (TTL), USB
Data output rate	1 to 1000 Hz
I/O	4x GPIO
GPIO Functions	Event triggering, PPS input/output

Physical and Electrical

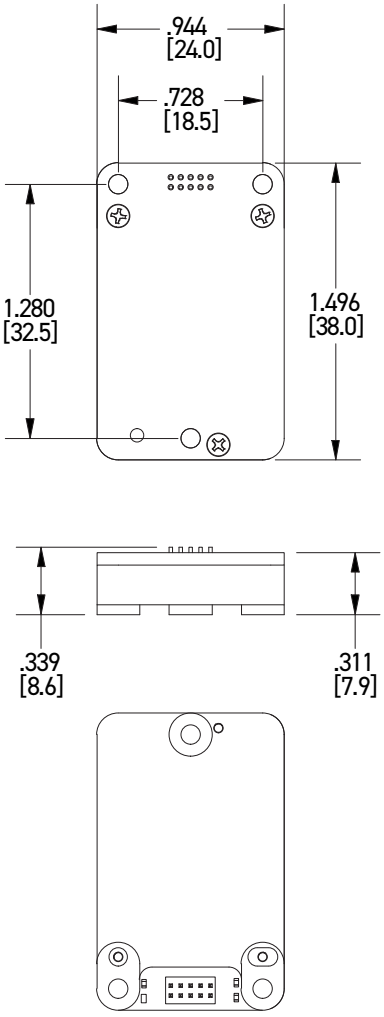
Weight	8.3g
Size	38 mm x 24 mm x 8.6 mm
Power Consumption	230mW (typical), 280mW (max)
Operating voltage	3.2 to 5.2 VDC
GPIO Voltage	3V (5V tolerant)
Operating Temperature	-40° to 85°C
MTBF	2,002,026 hours (Telcordia method, GM/35C)

Attitude Performance

Roll/pitch (static)	0.25°
Roll/pitch (dynamic)[2]	0.5°
Heading[3] **(static, AHRS only)**	0.5°
Heading[2,3] **(dynamic, AHRS only)**	2°

Additional Sensors	Range
Magnetometer (AHRS Only)	± 8G
Pressure Sensor	260 to 1260 mbar

Name	Part Number	Description
3DMCV7-AHRS	6286-9960	Attitude and Magnetometer-Aided Heading
3DMCV7-AR	6287-9960	Attitude and Relative Heading



Actual Size

[1]Turn on to turn on, <24 hours
[2]Automotive conditions, vehicle dynamics dependent
[3]Magnetic heading, with valid declination, magnetic environment, and hard/soft iron calibration

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™ & APIs

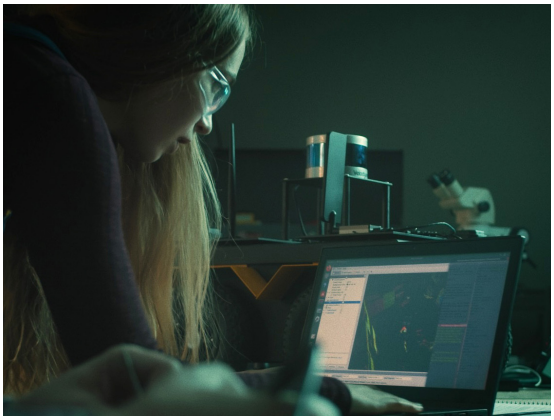
The MicroStrain Communication Library simplifies writing code to interact with our sensors. MSCL is our open-sourced API, readily available and fully-documented on GitHub, featuring valuable tools such as full documentation, example code, and a quick start guide.

Byte-level data communication protocols are available in the DCP section of our user manual.

ROS

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

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



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