

MicroStrain by HBK Technical Note

Current Firmware Upgrade

3DM-GV7-INS model 6290-9920

3DM-GV7-AHRS model 6288-9920

3DM-GV7-AR model 6289-9920

3DM-CV7-INS model 6291-9960

3DM-CV7-AHRS model 6286-9960

3DM-CV7-AR model 6287-9960

Date

February 27,2025

Summary

This technical note details the most current firmware available for the MicroStrain by HBK **3DM-GV7** and **3DM-CV7** inertial sensors. The technical note additionally describes firmware changes since each product's release and the use of SensorConnect software to perform the firmware upgrade.

Detail

As we see in the tables below, the current firmware for each of the **3DM-GV7** and **3DM-CV7** inertial sensors is version **1.2.05**. This firmware is contained in the file object named **7_series_firmware_v1205_b5.zhex**.

3DM-GV7-INS Firmware

Firmware Version	ChangeLog
1.2.03	Initial Firmware Release
1.2.04	<p>General:</p> <ol style="list-style-type: none">CV7/GV7-AR/AHRS/INS firmware package has been unified.Improved streaming built-in-test reliability.Reduced execution time, allowing more features to be turned on simultaneously. <p>Interface:</p> <ol style="list-style-type: none">Fixed USB frame send of exactly 64 bytes delaying the packet until the next data cycle. <p>Clock:</p> <p>Fixed the following clock model issues:</p> <ol style="list-style-type: none">Interrupt jitter caused too much jitter in the GPS Time value when using an external PPS sync.GPS time could jump 1 second under certain conditions. <p>Filter:</p> <ol style="list-style-type: none">Filter dynamics mode defaulted to "0x01".Added filter run command support for INS variant.Filter now enters "Init" mode from "Startup" before entering "Vertical Gyro."External Mag and Heading measurements now available on AR variant, allowing AHRS functionality with external heading measurements.INS variant position and velocity uncertainty growth tuned to be more accurate. <p>IMU:</p> <ol style="list-style-type: none">Fixed complementary filter quaternion inversion.

3DM-GV7-INS Firmware (continued)

Firmware Version	ChangeLog
1.2.05	Filter: <ol style="list-style-type: none"> 1. Fixed an issue with a pre-filtering step in the internal magnetometer data that caused poor magnetometer aiding during periods of vehicle rotation. 2. Fixed an issue with the vertical gyro aiding and the automatic initial pitch and roll estimates that caused instabilities in the angle estimates when the sensor was at high pitch and roll angles. 3. Fixed linear accel not excluding gravity.

3DM-GV7-AHRS Firmware

Firmware Version	ChangeLog
1.1.00	Initial Firmware Release
1.2.04	Same as 1.2.04 above.
1.2.05	Same as 1.2.05 above.

3DM-GV7-AR Firmware

Firmware Version	ChangeLog
1.1.00	Initial Firmware Release
1.2.04	Same as 1.2.04 above.
1.2.05	Same as 1.2.05 above.

3DM-CV7-INS Firmware

Firmware Version	ChangeLog
1.2.03	Initial Firmware Release
1.2.04	Same as 1.2.04 above.
1.2.05	Same as 1.2.05 above.

3DM-CV7-AHRS Firmware

Firmware Version	ChangeLog
1.0.06	Initial Firmware Release
1.0.07	Fixes a bug with the magnetometer's temperature bias correction. Important: Please read Footnote 1.
1.2.04	Same as 1.2.04 above.
1.2.05	Same as 1.2.05 above.

3DM-CV7-AR Firmware

Firmware Version	ChangeLog
1.0.06	Initial Firmware Release
1.0.07	Fixes a bug with the magnetometer's temperature bias correction. Important: Please read Footnote 1.
1.2.04	Same as 1.2.04 above.
1.2.05	Same as 1.2.05 above.

Footnotes

1. As a result of this firmware change, factory calibration of the model 6286-9960 3DM-CV7-AHRS magnetometer is invalidated. After completion of the firmware upgrade, the user must perform Magnetometer Calibration as described in the 3DM-CV7-AHRS User Manual: Magnetometer Calibration. This calibration restores full magnetometer operation after the firmware upgrade. The calibration is not required for the model 6287-9960 3DM-CV7-AR; it has no magnetometer.

Upgrading Firmware With SensorConnect

The firmware on **3DM-GV7** and **3DM-CV7** inertial sensors may be upgraded with MicroStrain by HBK's SensorConnect software. This Windows software is available for download on the MicroStrain by HBK website at: <https://www.microstrain.com/software/sensorconnect>. The user is required to download the ZHEX file from the **3DM-GV7** or **3DM-CV7** web page. SensorConnect performs the upgrade under user control.

Support

MicroStrain by HBK support engineers are always available by phone, email, Teams, and chat to support you in any way we can.