

3DM-GX1®

Gyro Enhanced Orientation Sensor



RS-485 Addressing Limitations

Overview

Every MicroStrain 3DM-GX1® will support either RS-232 or RS-485 communications. This technical note deals with certain limitations of RS-485 operation.

RS-485 Addressing Limitations

- Reference is made to the 3DM-GX1® Data Communications Protocol manual found at: <http://www.microstrain.com/manuals/3DM-GX1%20Data%20Communication%20Protocol%203101.pdf>
- A careful reading of the RS-485 Communications section by the user will make clear the limitations imposed by RS-485 addressing on the 3DM-GX1®'s overall functionality. RS-485 addressing does not allow 3DM-GX1® command bytes above 0x0F (15 in decimal) to be utilized. The chart below shows which commands are allowed in RS-232 and RS-485.

Command	Definition	RS-232	RS-485
0x00	Null Command (not implemented)	X	X
0x01	Send Raw Sensor Bits	X	X
0x02	Send Gyro-Stabilized Vectors	X	X
0x03	Send Instantaneous Vectors	X	X
0x04	Send Instantaneous Quaternion	X	X
0x05	Send Gyro-Stabilized Quaternion	X	X
0x06	Capture Gyro Bias	X	X
0x07	Send Temperature	X	X
0x08	Read EEPROM Value	X	X
0x09	Write EEPROM Value	X	X
0x0A	Send Instantaneous Orientation Matrix	X	X
0x0B	Send Gyro-Stabilized Orientation Matrix	X	X
0x0C	Send Gyro-Stabilized Quaternion & Vectors	X	X
0x0D	Send Instantaneous Euler Angles	X	X
0x0E	Send Gyro-Stabilized Euler Angles	X	X

Command	Definition	RS-232	RS-485
0x0F	Tare Coordinate System	X	X
0x10	Set Continuous Mode	X	
0x11	Remove Tare	X	
0x12	Send Gyro-Stabilized Quaternion & Instantaneous Vectors	X	
0x24	Write System Gains	X	
0x25	Read System Gains	X	
0x27	Self Test	X	
0x28	Read EEPROM Value with Checksum	X	
0x29	Write EEPROM Value with Checksum	X	
0x31	Send Gyro-Stabilized Euler Angles & Accel & Rate Vector	X	
0x40	Initialize Hard Iron Field Calibration	X	
0x41	Collect Hard Iron Field Calibration Data	X	
0x42	Compute Hard Iron Field Calibration	X	
0Xf0	Send Firmware Version Number	X	
0Xf1	Send Device Serial Number	X	

- **As we can see, implementation of tare commands, system gain commands, read/write EEPROM with checksum commands, hard iron calibration commands and certain multiple data quantity commands is not available.**
- It follows therefore that RS-485 users may wish to include an RS-232 communication cable in their kit so that they can deal with these limitations. An example would be to perform hard iron calibration on each 3DM-GX1® in your RS-485 network by pulling it temporarily into the RS-232 realm for the calibration.