Technical Note

Inertia-Link®
3DM-GX2®
Orientation Sensors

Direct EEPROM Configuration

Overview
MicroStrain's Inertia-Link® and 3DM-GX2® orientation sensors have been designed to generally eliminate direct configuration of the on-board non-volatile EEPROM. This technical note discusses the few EEPROMs that remain available to user manipulation.

This technical note assumes that:

- the user has a working knowledge of the Inertia-Link® and 3DM-GX2®;
- the user is familiar with the Inertia-Link® and 3DM-GX2® Data Communications Protocol at http://www.microstrain.com/pdf/dcp/Inertia-Link-3DM-GX2-data-communications-protocol.pdf;
- the user is building his own application.

Addressing and Write/Read EEPROM
EEPROM locations are referred to by their hexadecimal address. 0xFCA2 refers to EEPROM address FCA2; the decimal equivalent is (EEPROM address) 64674. Page 26 of the Data Communications Protocol describes the *Write Word to EEPROM* and *Read Word to EEPROM* commands.

EEPROM 0xFCA2 (decimal 64674)
Data Rate
This EEPROM address is used to control the Data Rate of the sensor. A discussion of the Data Rate can be found on Page 27 of the Data Communications Protocol. The acceptable value range for this EEPROM address is from 0xAA [decimal 170] (~300 Hz) to 0xC800 [decimal 51200] (1 Hz).

EEPROM 0xFCA6 (decimal 64678)
Set Continuous Mode
This EEPROM address is used to set Continuous Mode for the sensor. A discussion of Continuous Mode can be found on Pages 8 and 16 of the Data Communications Protocol. The acceptable value range for this EEPROM address is any of the following:

Value (in hex)	Value (in decimal)	Data Output
0x00	0	Stop Continuous Mode
0xC1	193	Raw Accelerometer and Angular Rate Sensor Outputs
0xC2	194	Acceleration and Angular Rate
0xC3	195	DeltaAngle and DeltaVelocity
0xC5	197	Orientation Matrix
0xC6	198	Orientation Update Matrix
0xC7	199	Scaled Magnetometer Vector
0xC8	200	Acceleration, Angular Rate and Orientation Matrix
0xCB	203	Acceleration, Angular Rate and Magnetometer Vector
0xCC	204	Acceleration, Angular Rate, Magnetometer Vector and Orientation Matrix
0xCE	206	Euler Angles
0xCF	207	Euler Angles and Angular Rates
0xD1	209	Temperatures
0xD2	210	Gyro Stabilized Acceleration, Angular Rate and Magnetometer Vector
0xD3	211	DeltaAngle, DeltaVelocity and Magnetometer Vectors

EEPROMs 0x00, 0x02, 0x04 (decimal 0, 2, 4)
Hard Iron Offset Vectors

These EEPROM addresses are used to set Hard Iron Calibration for the sensor. A detailed discussion of Hard Iron Calibration can be found in the ISD Iron Calibration manual. Address 0x00 is reserved for the X vector; address 0x02 is reserved for the Y vector; address 0x04 is reserved for the Z vector.

EEPROMs 0x12 through 0x22 (decimal 18 through 34)
Soft Iron Compensation Matrix

These EEPROM addresses are used to set Soft Iron Calibration for the sensor. A detailed discussion of Soft Iron Calibration can be found in the ISD Iron Calibration manual. The values in the matrix are input as follows:

M1,1	**M1,2**	**M1,3**
0x12(decimal 18)	0x14(decimal 20)	0x16(decimal 22)
M2,1	**M2,2**	**M2,3**
0x18(decimal 24)	0x1A(decimal 26)	0x1C(decimal 28)
M3,1	**M3,2**	**M3,3**
0x1E(decimal 30)	0x20(decimal 32)	0x22(decimal 34)

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