EM MONITOR USER GUIDE

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1 INTRODUCTION

EM Monitor is a graphical utility to demonstrate the EM7180SFP sensor fusion platform module functionality through the use of dials, plots, tables and a 3D display. In order to operate properly, the utility must be connected to an EM7180SFP module via a SAB2 board (EM7180DVK).

2 SCOPE

This document describes the operation of the EM Monitor user interface and its various display elements.

3 GENERAL OPERATION

Start the application as applicable to your operating system. Using the Button Menu as shown in Figure 1, click Connect to connect the software to your EM7180SFP module product. Once connected, select which sensors to view as plots, or which rotation sensor to use as the source for the dials and compass.

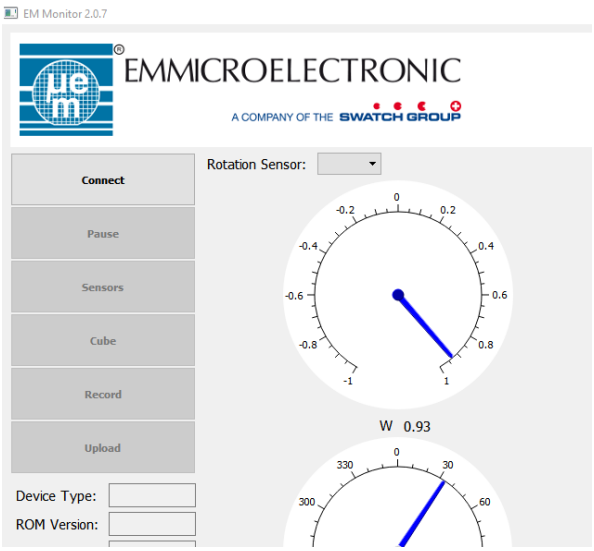


Figure 1 – Button Menu

The device will start and begin collecting data as shown in Figure 2.

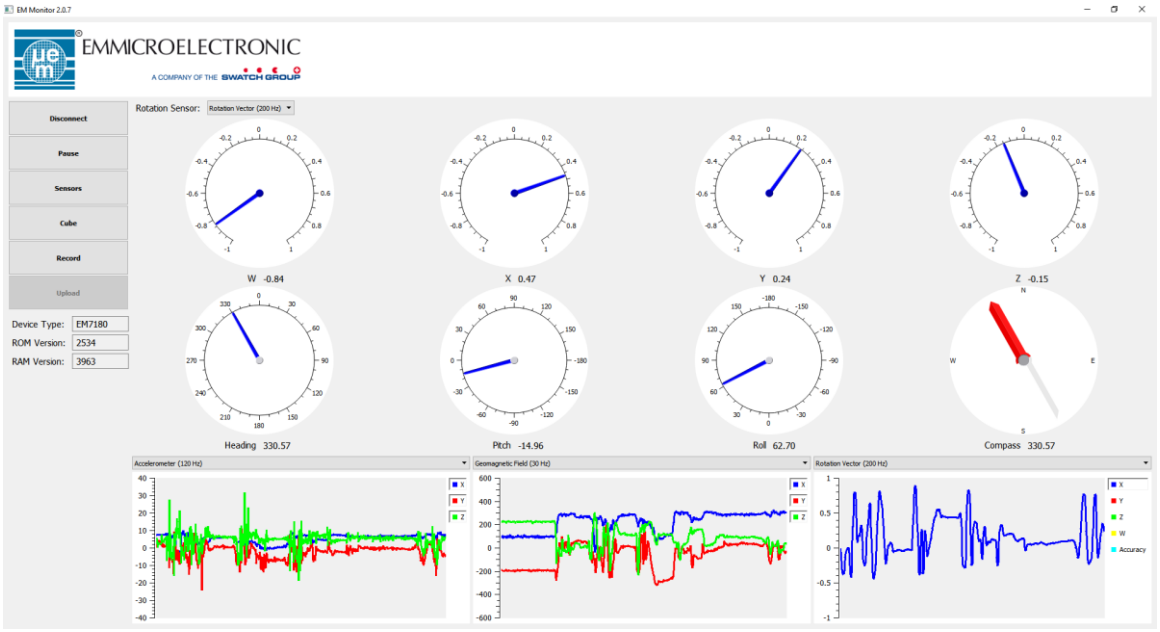


Figure 2 - Collecting Data

Received sample data can be saved by clicking the ‘Record’ button, and sensor information can be viewed and/or modified by clicking the ‘Sensors’ button. The dial and plot updates can be temporarily suspended by clicking the ‘Pause’ button. Additionally, a 3-D, rotating cube can be displayed by clicking the ‘Cube’ button.

3.1 MAIN WINDOW

Figure 3 - Main Window

3.2 BUTTON MENU

The Button Menu, shown in Figure 1, provides primary control of the application.

3.2.1 Connect/Disconnect

Connect to target or disconnect from target.

Clicking once will connect to the target device. Upon successful connection, the button text will change to Disconnect. Clicking again will disconnect from the target.

3.2.2 Pause/Resume

Pause/resume dial and plot updates.

Click once to stop updates to the dials and plots. Sample data is still collected during pause, and recording will continue uninterrupted. Once paused, the button text will change to Resume. Clicking again will resume updates.

3.2.3 Sensors

Opens the Sensors Window

3.2.4 Cube

Opens the Cube Window

3.2.5 Record/Stop Recording

Record data to a file

Clicking will open a file dialog, allowing the user to select a destination file, which need not exist. Upon successful file selection, recording will begin and the button text will change to Stop Recording. Clicking again will stop the current recording and close the file.

3.2.6 Upload

NOTE: Upload is disabled. In case this Menu is enabled you might need to contact EM Microelectronic support for recovery instructions.

3.3 SENSORS WINDOW

Clicking the Sensors button will display the Sensors window as shown in Figure 4. This window displays a data table, with each row displaying information for a detected sensor, and each column displays a particular data element for all sensors.

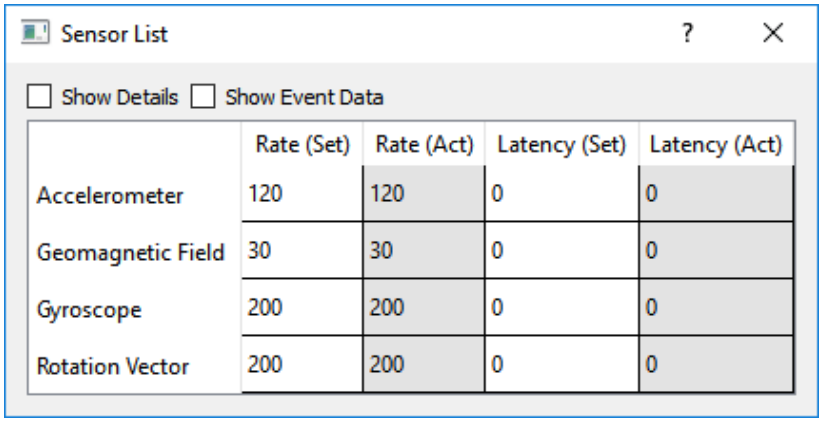


Figure 3 – Sensors Window

Fields with a light background may be edited, while fields with a darker background are read-only. The editable fields may be edited by double-clicking on the field, or simply selecting the field and entering a numeric value.

3.3.1 Show Details

Checking the Show Details checkbox will add additional columns displaying more detailed information about each sensor as shown in Figure 5. Once checked, it may be necessary to use the horizontal scrollbar (if shown) to scroll the table to view the additional columns.

Uncheck to remove these additional columns.

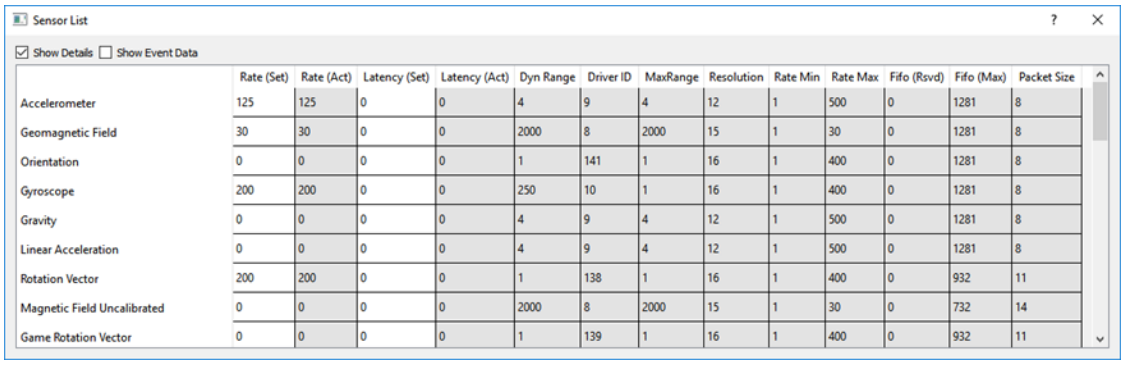


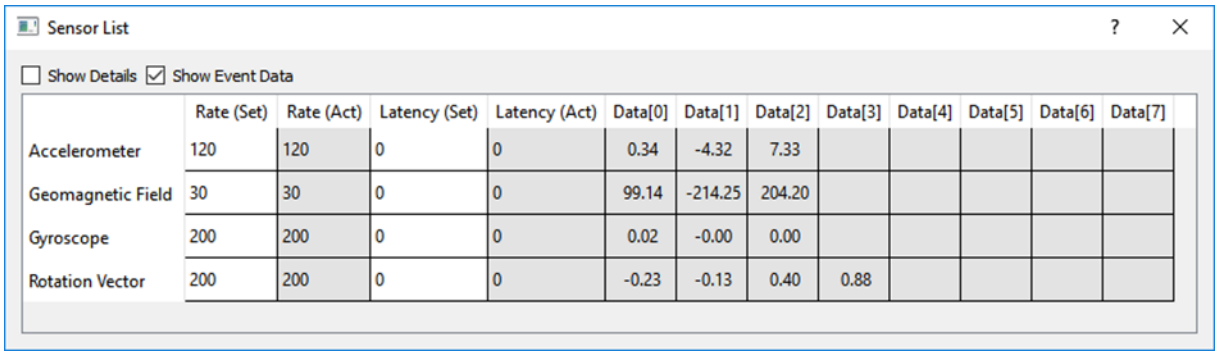
Figure 5 - Show Details

NOTE: Not applicable to EM7180SFP

3.3.2 Show Event Data

Checking the Show Event Data checkbox will add additional table columns displaying the real-time sample data being received for each sensor, as shown in Figure 6. Once checked, it may be necessary to use the horizontal scrollbar (if shown) to scroll the table to view the additional columns.

Uncheck to remove these additional columns.



	Rate (Set)	Rate (Act)	Latency (Set)	Latency (Act)	Data[0]	Data[1]	Data[2]	Data[3]	Data[4]	Data[5]	Data[6]	Data[7]
Accelerometer	120	120	0	0	0.34	-4.32	7.33					
Geomagnetic Field	30	30	0	0	99.14	-214.25	204.20					
Gyroscope	200	200	0	0	0.02	-0.00	0.00					
Rotation Vector	200	200	0	0	-0.23	-0.13	0.40	0.88				

Figure 6 - Event Data

3.3.3 Sensor Table Columns

The following table columns may be shown:

- **Rate (Set)**
  The rate, in Hz, set by the user. This field may be edited.
- **Rate (Act)**
  The actual rate, in Hz, the sensor is being sampled. This may be different than the rate set for a variety of reasons, including fulfilling requirements of other sensors.
- **Latency (Set)**
  The latency (fifo buffering time), in milliseconds, configured for the sensor. Sample data for all sensors will be collected at a rate defined by the smallest latency value. A value of 0 indicates that data should be collected at every sample, or as quickly as possible.
  NOTE: Not applicable to EM7180SFP
  - *LATENCY (ACT)*
    The actual latency value in use
    NOTE: Not applicable to EM7180SFP
- **Dyn Range**
  The current range
  NOTE: Not applicable to EM7180SFP
- **Driver ID**
  Internal driver ID
  NOTE: Not applicable to EM7180SFP
- **Max Range**
  Maximum range
  NOTE: Not applicable to EM7180SFP
- **Resolution**
  Number of bits of resolution
  NOTE: Not applicable to EM7180SFP
- **Rate Min**
  Minimum rate of the sensor
  NOTE: Not applicable to EM7180SFP
- **Rate Max**
  Maximum rate of the sensor
  NOTE: Not applicable to EM7180SFP
- **Fifo (Rsvd)**
  FIFO bytes reserved for this sensor
  NOTE: Not applicable to EM7180SFP
- **Fifo (Max)**
  Maximum FIFO size
  NOTE: Not applicable to EM7180SFP
- **Packet Size**
  The size of the sensor data received from the device, in bytes.
- **Data[0] To Data[7]**
  Each sensor sends up to 8 bytes of data. These columns display the data, scaled to correct units for the sensor.

3.4 CUBE WINDOW

The cube window displays a 3D, rotating cube.

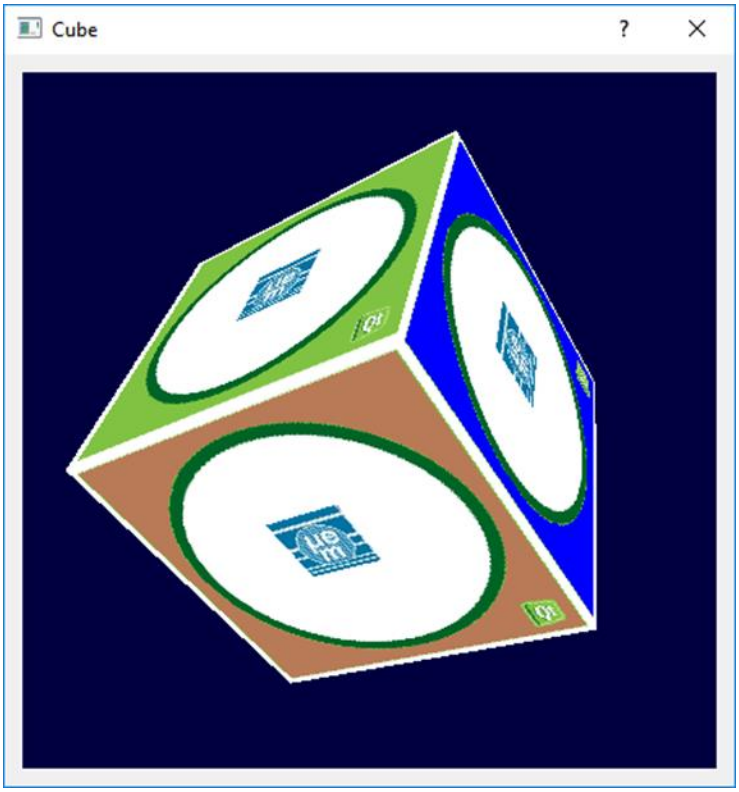


Figure 7 - Cube Window

3.5 ROTATION DIALS

The rotation dials show the output of the selected Rotation Sensor. The scaled X, Y, Z and W quaternion values are displayed on the top row, with the calculated heading, pitch and roll, along with compass shown in the bottom row.

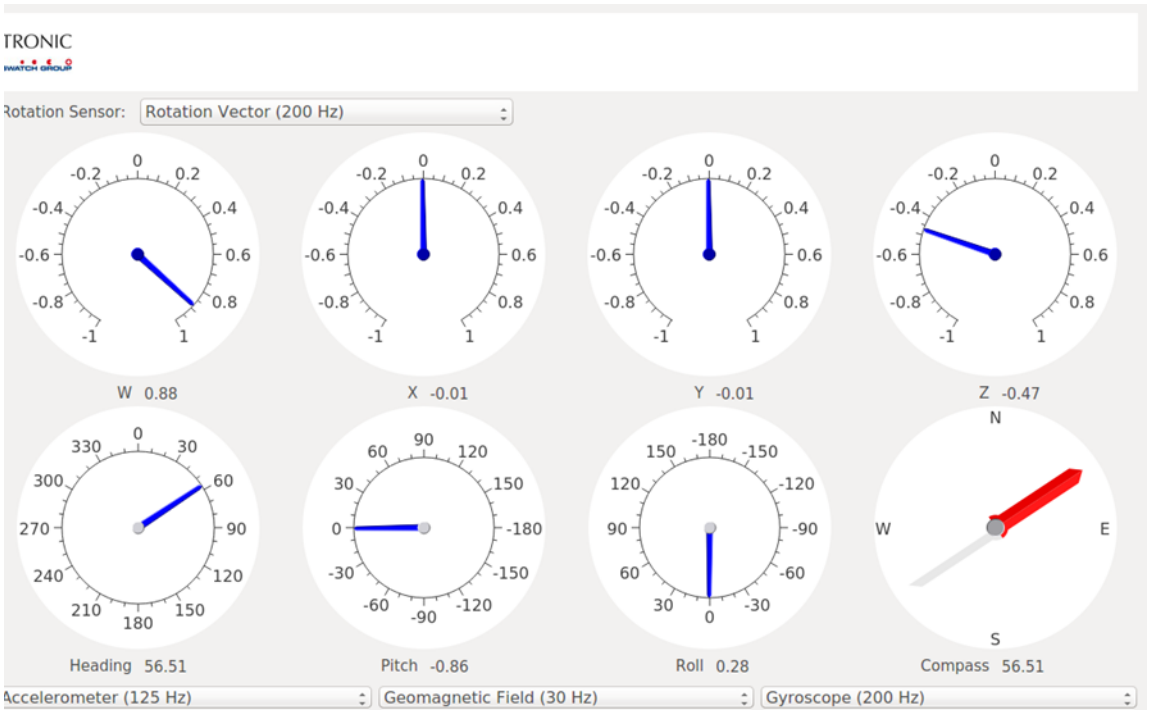


Figure 8 - Rotation Dials

3.6 SENSOR PLOTS

The sensor plots allow for simultaneously plotting of up to 3 sensors. The sensor for each plot is selected using the combobox above the plot.

One or more axes will be shown for each selected sensor. By default, all axes are enabled. To hide any axis, simply click the axis button in the plot legend.

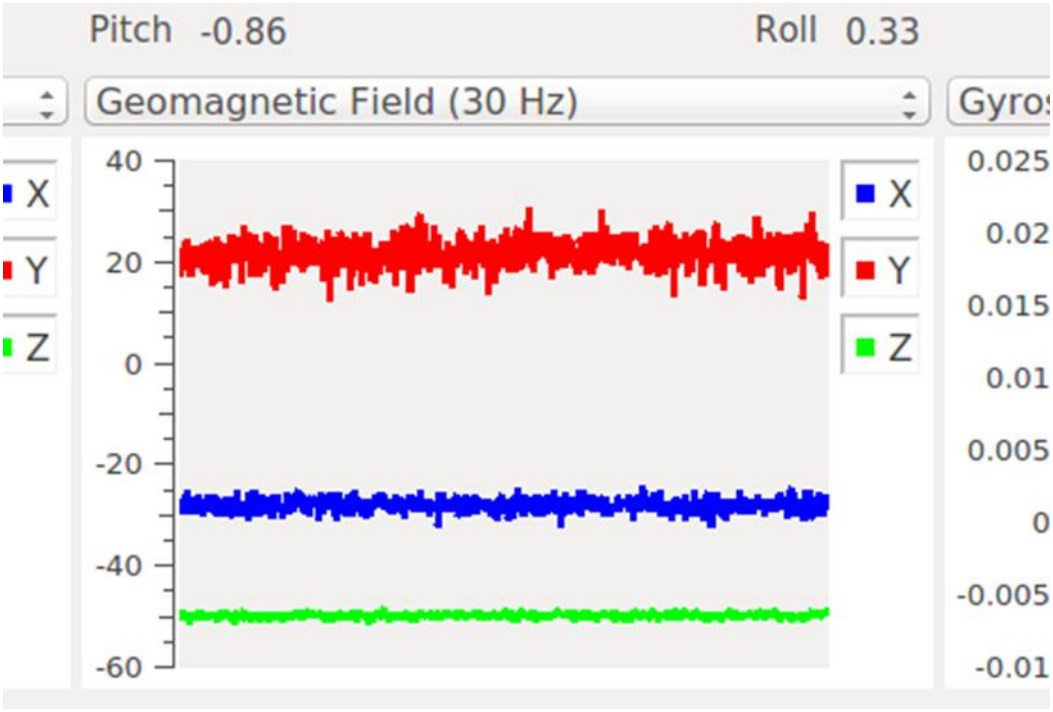


Figure 9 - Sensor Plot