LORD QUICK START GUIDE

3DM-RQ1-45™

Ruggedized Tactical Grade GPS-Aided Inertial Navigation System

Starter Kit Components

The model 3DM-RQ1-45™ (PN: 6232-4071) starter kit contains:

1. 3DM-RQ1-45™ Module (PN: 6232-xx7x)
2. GPS Antenna (PN: 9010-0100)
3. RS422-to-USB Adapter (PN: 9028-0011)
4. 24 VDC Power Supply (PN: 9011-0039)
5. 4 Piece Universal Power Supply Plug Adapters (PN: 9011-0022)
6. DB9-to-7 Pin Glenair® Cable (PN: 4005-0009)
7. MIP™ Monitor Windows Software CD (PN: 8200-0019)

Figure 1: *3DM-RQ1-45™*

Software Installation

1. ***IMPORTANT:*** *Before installing this software, insure that the Windows Operating System Service Pack is the latest available; older versions will cause installation errors.*
2. Insert the MIP™ Monitor software CD into the host computer's drive.
3. An AutoPlay window will appear; click Run AUTORUN.EXE. If it does not, navigate to the drive and double-click AUTORUN.EXE.
4. The CD menu will appear.
5. Click Install MIP Monitor Software and follow the on-screen instructions to complete the installation. You will receive a message indicating successful installation and be asked to restart the system. Do not restart the system yet.
6. Click Install MIP Hard and Soft Iron Calibration Software and follow the on-screen instructions to complete the installation. You will receive a message indicating successful installation and be asked to restart the system. Do not restart the system yet.
7. Click Install Inertial Drivers and follow the on-screen instructions to complete the installation.
8. Click the Install Inertial Manuals and follow the on-screen instructions to complete the installation.
9. Remove the CD and restart the system.

Hardware Installation

1. Connect USB/A connector of USB/A-to-USB/B Cable to host computer.
2. Connect USB/B connector to RS422-to-Serial Adapter. **Note:** USB flag will appear in lower right hand of Windows desktop indicating driver has been installed.
3. Connect DB9 connector of DB9-to-7 Pin Glenair® Cable to RS422-to-Serial Adapter.
4. Connect 7 Pin Glenair® connector to 3DM-RQ1-45™ Module, observing keyway.
5. Connect male SMA connector of GPS Antenna to 3DM-RQ1-45™ Module. **Note:** Deploy GPS Antenna so that it can 'see' the sky; it will not see satellites indoors.
6. Connect male barrel connector of 24 VDC Power Supply to female barrel connector of DB9-to-7 Pin Glenair® Cable.
7. Select appropriate Power Supply Plug Adapter for local electrical service and install on 24 VDC Power Supply.
8. Plug the 24 VDC Power Supply into an appropriate electrical outlet to turn on the 3DM-RQ1-45™.

Establish Communication

1. Launch the MIP™ Monitor software and the Main window will appear.
2. The software will automatically search for the 3DM-RQ1-45™ and display it in the Device pane. The Model Name, Serial Number, Firmware Version, Model, Options and COM port will be displayed as shown in Figure 2.
3. Click the device in the in the display to highlight it.
4. Click Settings.
5. Click Device and the Device Setup window appears, as shown in Figure 3.

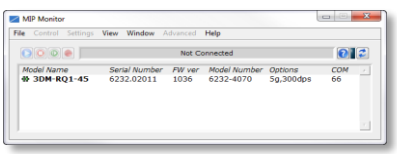

Figure 2: *MIP™ Monitor Main window*

LORD MicroStrain® SENSING SYSTEMS

Set Up Sampling

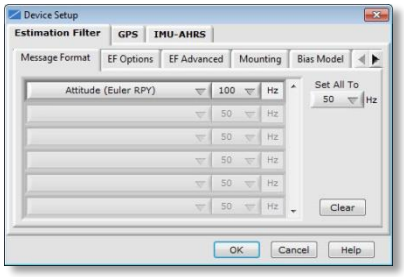

Figure 3: *Device Setup window*

1. Click the Estimation Filter tab.
2. Click the Message Format tab.
3. Click the top drop-down to the left and select Attitude (Euler RPY); this is roll, pitch and yaw.
4. Click the top drop-down to the right and select 100 Hz; this is a sampling rate of 100 samples per second.
5. Click the EF Options tab.
6. Click the Vehicle Dynamics Mode drop-down and select Portable.
7. Click the GPS Update Source drop-down and select Internal GPS.
8. Click the Heading Update Input Source drop-down and select Internal Magnetometer (if the unit has magnetometers) or select Internal GPS Velocity.
9. Check the Enable Auto EF Initialization checkbox.
10. Click the GPS tab.
11. Click the top drop-down to the left and select Position (LLH); this is latitude, longitude and height.
12. Click the top drop-down to the right and select 1 Hz; this is a sampling rate of 1 sample per second.
13. Click the IMU-AHRS tab.
14. Click the Message Format tab.
15. Click the top drop-down to the left and select Accelerometer Vector; this is X, Y and Z axis accelerations.
16. Click the top drop-down to the right and select 100 Hz; this is a sampling rate of 100 samples per second.
17. Click OK and the Device Setup window disappears.

Start/Display/Stop Sampling Estimation Filter Data

1. Click View. Click EF Data Monitor and the Estimation Filter Data window appears.
2. Click the *blue arrow* Start Streaming Data icon and Roll, Pitch and Yaw are displayed; rotate the 3DM-RQ1-45™ module and observe the output.
3. Click the *red square* Stop Streaming Data icon and the device will stop streaming data.
4. Click the *red X* in the upper right-hand corner of the window and close the Estimation Filter Data window.

Start/Display/Stop Sampling GPS Data

1. Click View. Click GPS Data Monitor and the GPS Data window appears.
2. Click the *blue arrow* Start Streaming Data icon and Latitude, longitude and Height are displayed.
3. Click the *red square* Stop Streaming Data icon and the device will stop streaming data.
4. Click the *red X* in the upper right-hand corner of the window and close the GPS Data window.
5. **Note:** GPS takes ~30 seconds after power-up to acquire.

Start/Display Sensor Data

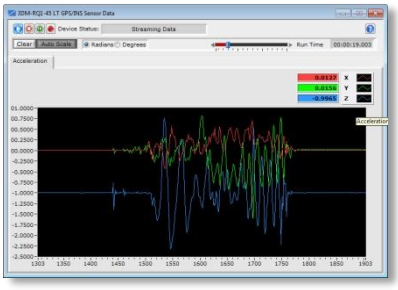

Figure 4: *Sensor Data window*

1. Click View. Click Sensor Data Monitor and the Sensor Data window appears.
2. Click the *blue arrow* Start Streaming Data icon and X, Y and Z axis accelerations are displayed.
3. Place the 3DM-RQ1-45™ module flat and stable on your desktop with the label up.
4. Observe the accelerations and you will see the X axis outputting ~0*g*, the Y axis outputting ~0*g* and the Z axis outputting ~-1*g*.

Save Data to File and Stop Sampling Sensor Data

1. While still streaming the acceleration data, click the red dot Arm Recording icon and the Log File Format window will appear.
2. Click the drop-down and select Spreadsheet (CSV), click OK, and a dialog box appears.
3. Navigate to a data folder of your choosing and name your data file.
4. Click OK and the dialog box disappears.
5. All further acceleration data is now being written to the file as well as being displayed in the graph.
6. Click the *red square* Stop Streaming Data icon and the device will stop streaming data.
7. Click the *red dot* Arm Recording icon to close the data file.
8. A confirming message box will appear. Click OK.

9. Click the *red X* in the upper right-hand corner of the window and close the IMU/AHRS Data window.
10. Open the data file with a text viewer or a spreadsheet program like Microsoft Excel to view the saved data.

Congratulations

You are up and running! LORD MicroStrain® support engineers are always available to expand on this subject and support you in any way we can.

8501-0048 rev 004

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