Wireless Sensor Nodes
Measuring Inclination with a G-Link®-LXRS®

OVERVIEW

The G-Link®-LXRS® wireless node is designed for use as an accelerometer, but with quick modifications to the calibration values it can also be used as a +/- 45° inclinometer. The measurement resolution will be better with +/- 2 g node than with a +/- 10 g node, but either will achieve an accuracy of +/- 2°.

Using the G-Link-LXRS as an inclinometer is accomplished using the node’s factory calibration values and a Microsoft Excel® calculator available from the LORD MicroStrain® website.

PROCEDURE

1. **Find the factory calibration values:** The node calibration certificate is provided with the node when it is purchased. It includes the calibration values for slope and offset for each channel. Locate the calibration values on the certificate. Alternatively these values can be retrieved from the node memory by looking at the channel configuration in Node Commander® (Figure 1 - Node Calibration Values).
2. **Open the calculator:** Click the link below to download the inclination calculator from the LORD MicroStrain® website. It will launch automatically in Microsoft Excel®.

   **G-Link Inclination Calculator**

3. **Calculate the new slope and offset value:** In the calculator, enter the current factory calibration values in the corresponding fields (Figure 2 - New Calibration Values). Up to two channels can be calculated at once. The new calibration values are displayed on the graph as the formula \( y = mx + b \), where \( m \) equals the new slope value and \( b \) equals the new offset value.

   ![Figure 2 - New Calibration Values](image)

4. **Enter the node configuration menu:** Open Node Commander®, and establish communication with the node through the gateway. Open the node configuration menu by right-clicking on the node name and selecting Configure > Configure Node. Check the Channel Enabled check box next to the channel.
name, and then the channel Configure button to open the channel configuration menu (Figure 3 - Modify Calibration Values).

5. **Change the units**: In the configuration window, change the conversion coefficients class to Custom Units and the units to Degrees (deg).

![Configuration - Node XU22](image)

**Figure 3 - Modify Calibration Values**

6. **Enter the new calibration values**: Use the Modify button to allow entering of the new values in the channel configuration window. Select Lock when completed and exit the menu (Figure 4 - Enter New Values).

![Configuration Channel](image)

**Figure 4 - Enter New Values**
8. **Repeat for channel two and apply the settings:** Modify the channel 2 units and calibration values, as determined in the inclination calculator. Apply, and exit the configuration menus.

9. **Measure inclination:** Start node sampling in Node Commander®, and view the acquired data. Data acquisition can be monitored locally in Node Commander or remotely using the SensorCloud™ platform on an Ethernet-enabled network (*Figure 5 - Measuring Inclination with SensorCloud™*). Tilt the node on each on the axes with the new calibration values, and verify the outputs.

*Figure 5 - Measuring Inclination with SensorCloud™*