2820 Wilderness Place, Unit C
Boulder, Colorado, 80301
Tel: (303) 443 6611

Leap Wireless Sensor System

Linear Potentiometer Sensor Device User Manual

Contents

Copyright and Trademarks

1. About this Manual

This User Manual describes specific configuration and usage of the **Leap Linear Potentiometer Sensor Device** designed to measure the output of a linear potentiometer. This allows for monitoring a physical crack, gap, or length over time. The Leap Device provides an excitation voltage, reads the resistance from the potentiometer slider, and converts that resistance to length as specified by the configuration values which are described in a later section.

General usage of the **Leap Wireless Sensor System**, including a system Quick Start Guide, is described in the User Manual linked here:

Leap Wireless Sensor System User Manual

2. Hardware Configuration

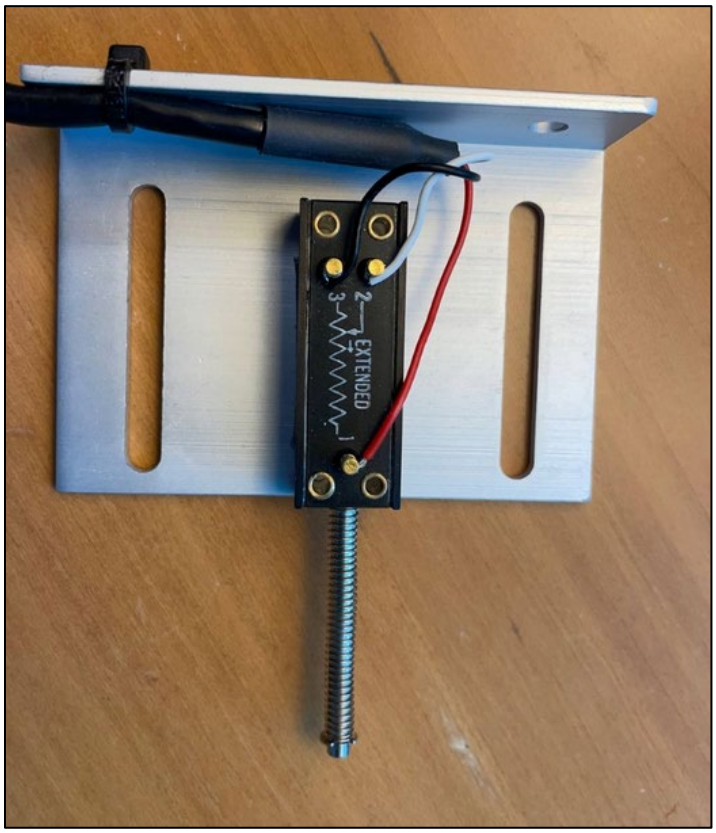
Hardware configuration may be required by the end user if attaching a linear potentiometer in the field. If it was attached at the factory the end user can skip this section.

2.1 Linear Potentiometer Wiring

Linear Potentiometers have 3 connections.

- **Red Wire:** Extended-Side Pin
- **Black Wire:** Retracted-Side Pin
- **White wire:** Slider Pin

An example is shown in the picture below:



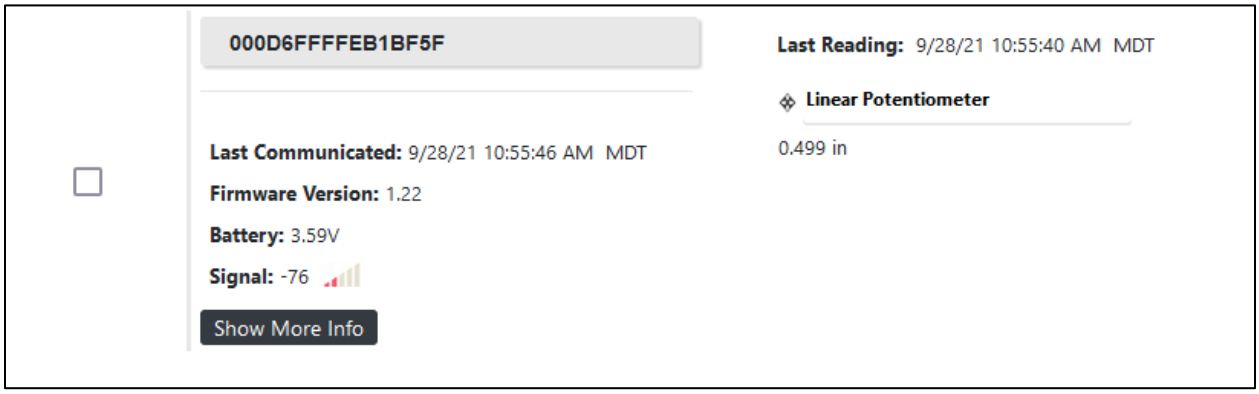
Important: To ensure the most accurate readings solder all wire connections with quality solder joints. Insulate connections at the joints to prevent any shorts.

Important: **Polarity:** After setting up the device and viewing the readings in the Web Interface, if extending or retracting the potentiometer is yielding results with the reverse polarity than desired, simply reverse the Red and Black wires.

3. Device Configuration

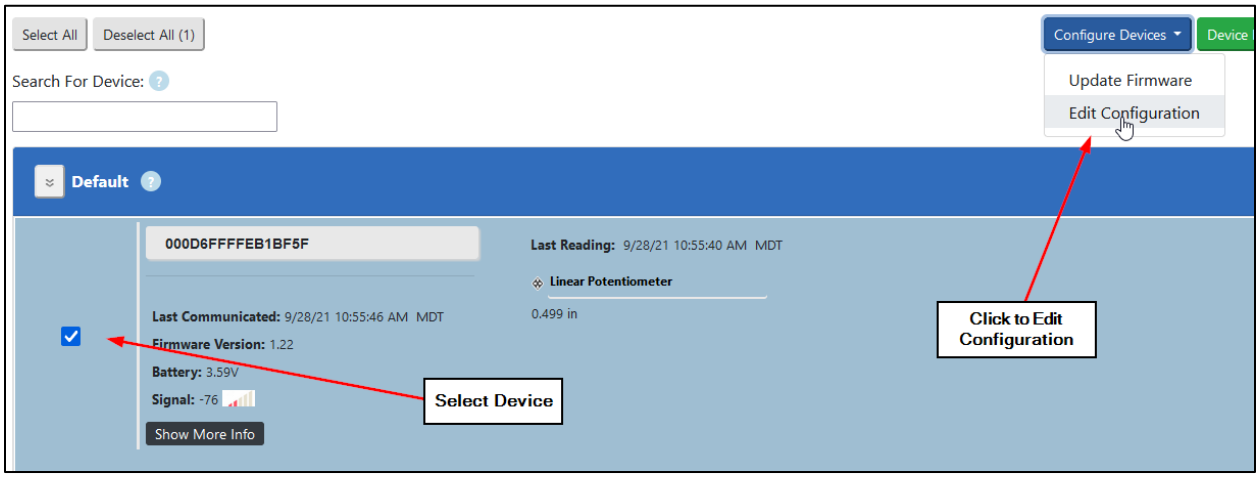
3.1 Device Web UI View

The default **Leap Linear Potentiometer Sensor Device** display in the Leap Wireless Sensor Web Interface looks like this:

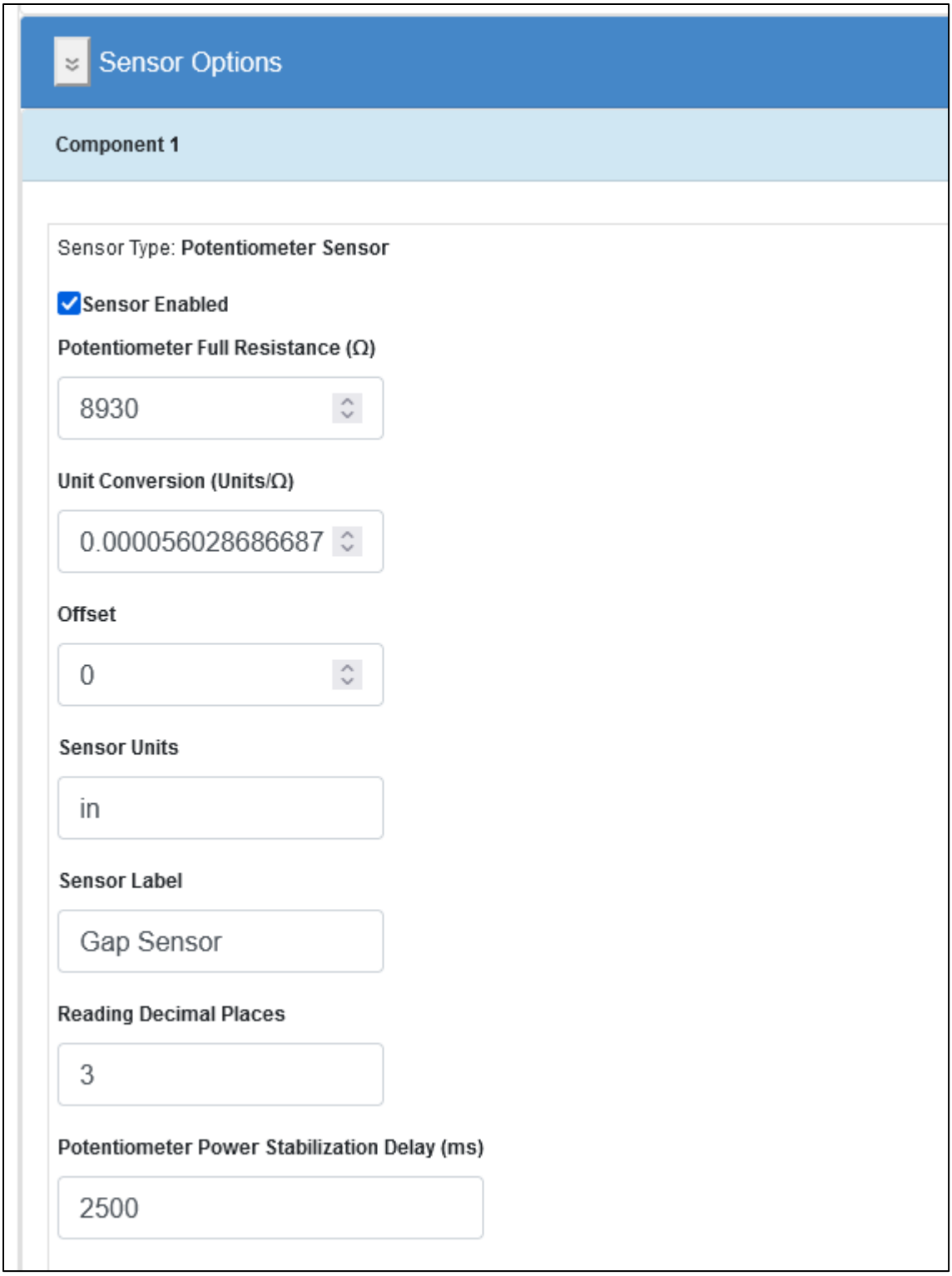


3.2 Edit Device Configuration

Edit the Device configuration by selecting the Device panel check box and clicking **Configure Devices->Edit Configuration**



In the dialog box that appears, scroll down to the **Sensor Options** section to find configuration options for the **Potentiometer Sensor** as pictured here:



If Phase IV sent the **Leap Linear Potentiometer Sensor Device** with a Linear Potentiometer Sensor already connected it will already be configured and calibrated. Adjusting the configuration won't be necessary. If connecting a Linear Potentiometer Sensor in the field adjust the options as appropriate as described below:

- **Potentiometer Full Resistance:** The full resistance value is generally in the datasheet for a linear potentiometer but for more accurate results use an ohm meter to measure the resistance between the retracted-side pin and the extended-side pin. Enter this value for this configuration option.

- **Unit Conversion:** The potentiometer slider usually doesn't read the full resistance when fully extended. Similarly, the potentiometer slider won't read 0 when fully retracted. Consequently, the best way to calculate the Unit Conversion value is to use an ohm meter the measure the resistances.

  Measure the resistance with an ohm meter between the slider and retracted-side pin when the linear potentiometer is both fully extended and fully retracted. Use this formula and enter the result in this configuration value:

$$\boldsymbol{Unit\ Conversion}\left(\frac{\boldsymbol{length}}{\Omega}\right) = \frac{Stroke\ Lenth\ (from\ datasheet)}{Resistance\ Fully\ Exended - Resistance\ Fully\ Retracted}$$

- **Offset:** Account for a non-zero reading at zero length. Usually not necessary if the Unit Conversion process was accurate.

- **Sensor Units:** Change so the display on the Web UI displays the correct units. Should be the units used in the Unit Conversion calculation: *in, mm, ft,* etc

- **Sensor Label:** Change to display the correct sensor label on the Web UI. For example: *Crack Sensor, Gap Sensor, Movement Sensor,* etc

- **Reading Decimal Places:** Adjust the precision according to required accuracy of the sensor. For a linear potentiometer measuring from 0 to 0.5 inches it may be useful to read to the accuracy of 3 decimal places to get measurements to the one-thousandth of an inch. Enter 3 for this configuration value in this case. If, however, the unit conversion was calculated in micro meters then likely no decimal places are required for the reading. Enter 0 for this configuration value in this case.

- **Potentiometer Power Stabilization Delay:** When the device takes a reading the potentiometer is momentarily excited with a voltage produced by the Leap Device. This delay allows the sensing circuitry to stabilize for an accurate reading. For most sensors the default, 2500 ms, is the correct value. Adjust only if instructed by a Phase IV representative.

4. Technical Support

For more information about our products and services, or for technical assistance:

Visit us at: www.phaseivengr.com
Tel: +(303) 443 6611 (USA – MST 8:00 a.m. to 5:00 p.m., Mon.-Fri.)
E-Mail: support@phaseivengr.com

If you need assistance, please provide the product part number, product serial number, and product version.