LEAP SENSORS 53-100187-18 Linear Potentiometer Sensor Device User Manual

LEAP SENSORS 53-100187-18 Linear Potentiometer Sensor Device User Manual

Contents

Copyright and Trademarks

No part of this product or related documentation shall be reproduced in any form by any means without prior written authorization of Phase IV Engineering, Incorporated. No part of this document shall be reproduced, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from Phase IV Engineering, Incorporated.

Although every precaution has been taken in the preparation of this document, Phase IV Engineering assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Phase IV Engineering assumes no responsibility for any loss or claims by third parties that may arise through the use of this product.

Phase IV Engineering assumes no responsibility for any damage or loss caused by deletion of data as a result of malfunction, repairs, or battery replacement, or power failure.

Phase IV Engineering, Incorporated may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Phase IV Engineering, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property.

This manual, its related hardware, software and documentation are subject to change without notice and do not represent a commitment on the part of Phase IV Engineering. Phase IV Engineering reserves the right to make changes in the product design without reservation and without notification to its users.

© 2021 by Phase IV Engineering, Incorporated, 2820 Wilderness Place, Unit C, Boulder, Colorado 80301, USA. All rights reserved.

All brands and product names are trademarks or registered trademarks of their respective owners.

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:

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.

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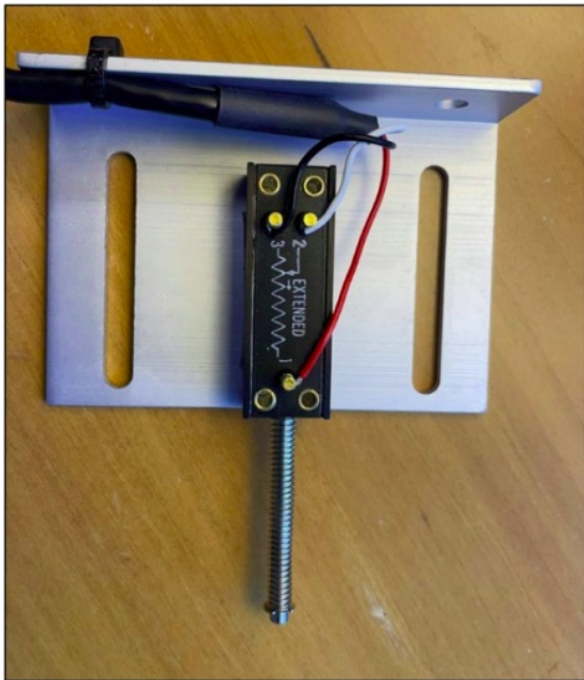
Important : To ensure the most accurate readings solder all wire connections with quality solder joints. Insulate connections at the joints to prevent any shorts.

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.

Device Configuration

Device Web UI View
The default Leap Linear Potentiometer Sensor Device display in the Leap Wireless Sensor Web Interface looks

like this:

Edit Device Configuration

Edit the Device configuration by selecting the Device panel check box and clicking **Configure Devices->Edit Configuration**
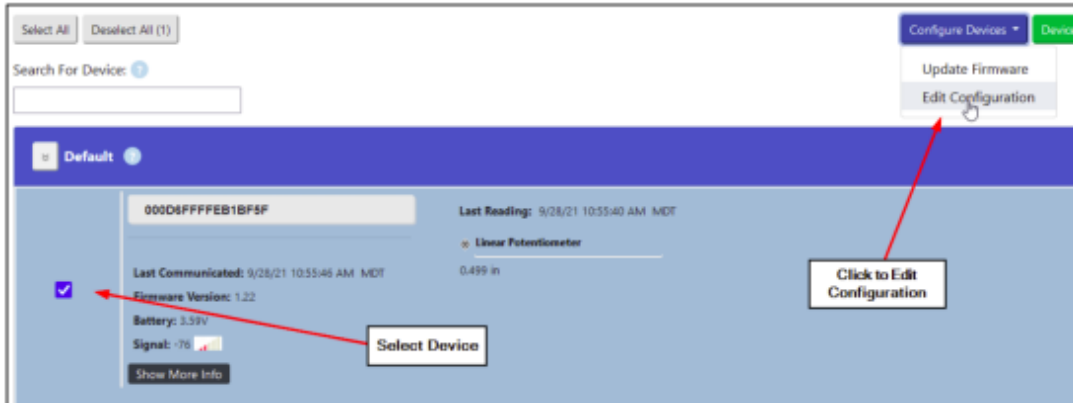
In the dialog box that appears, scroll down to the Sensor Options section to find configuration options for the **Potentiometer Sensor** as pictured here:

Sensor Options

Component 1

Sensor Type: Potentiometer Sensor

☑ Sensor Enabled

Potentiometer Full Resistance (Ω)

8930

Unit Conversion (Units/Ω)

0.000056028686687

Offset

0

Sensor Units

in

Sensor Label

Gap Sensor

Reading Decimal Places

3

Potentiometer Power Stabilization Delay (ms)

2500

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:

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

- **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.

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

Documents / Resources

LEAP SENSORS 53-100187-18 Linear Potentiometer Sensor Device [pdf] User Manual
53-100187-18 Linear Potentiometer Sensor Device, 53-100187-18, Linear Potentiometer Sensor Device, Potentiometer Sensor Device, Sensor Device

References

- [»] **Phase IV Engineering | Wireless Sensor Solutions for the Industrial IoT**
- [»] **Phase IV Engineering | Wireless Sensor Solutions for the Industrial IoT**
- [○] **Error**
- **User Manual**