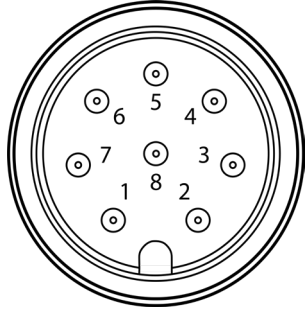


## Layer N Digital Connector Diagram



	Name	Function
Pin 1	DIO 0	Discrete I/O Signal 0
Pin 2	INTR	Interrupt Signal
Pin 3	SCL	I2C Clock Signal
Pin 4	SDA	I2C Data Signal
Pin 5	Shield	Shield Ground
Pin 6	DIO 1	Discrete I/O Signal 1
Pin 7	GND	Power Ground
Pin 8	3.3VDD	Power Supply

## Specifications

## INPUT POWER

**Voltage:** 2.8 V<sub>DC</sub> - 3.3 V<sub>DC</sub>

## DIO DIGITAL INPUTS

$V_{inHighThreshold} = 2.2 V_{MAX}$

$V_{inLowThreshold} = 0.3 V_{MIN}$

$V_{inMAX} = 30 V_{DC}$

## DIO DIGITAL OUTPUTS

2x Open Drain 100 mA max

$V_{MAX} = 30 V_{DC}$

## ENVIRONMENTAL

**Operating Temperature:** -40 to 85°C (-40 to 185°F)

**Rating:** IP67 when mated

## MECHANICAL

**Dimensions:** 22.1 mm W x 96.7 mm L (0.87" x 3.80")  
not including mounting tabs

## GENERAL

**Agency Approvals:** CE, EMC 2014/30/EU,  
LVD 2014/35/EU

**Configuration:** Configurable via Layer N Smart Interface  
and SYNC configuration software

**Software:** Compatible with OEG and SYNC  
configuration software

## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

**OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.**

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

## RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair or calibration,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a trademark of OMEGA ENGINEERING, INC.

© Copyright 2019 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.



**SP-010**  
Layer N Load Cell Smart Probe



omega.com info@omega.com

**Servicing North America:**

**U.S.A. Headquarters:** Omega Engineering, Inc.  
800 Connecticut Ave. Suite 5N01, Norwalk, CT 06854  
Toll-Free: 1-800-826-6342 (USA & Canada only)  
Customer Service: 1-800-622-2378 (USA & Canada only)  
Engineering Service: 1-800-872-9436 (USA & Canada only)  
Tel: (203) 359-1660 Fax: (203) 359-7700  
e-mail: info@omega.com

**For Other Locations Visit [omega.com/worldwide](http://omega.com/worldwide)**

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

## Introduction

Use this Quick Start Guide to set up your Layer N SP-010 Load Cell Smart Probe. For additional information regarding your SP-010, refer to the User Manual available on the Omega website.

## Materials

### Included with your SP-010

- SP-010 Unit
- Quick Start Guide

### Additional Materials Needed

- Layer N Smart Interface
- Computer/Laptop with Windows OS
- SYNC configuration software
  - Downloadable on the OMEGA website
- 4-Wire Bridge sensor

### Optional Materials


- M12-S-F-FM connector
  - Sold separately on the OMEGA website

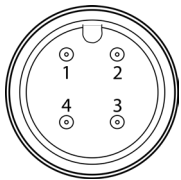
## Before you Begin

To fully setup the SP-010, ensure the following prerequisites are met:

- Ensure SYNC is downloaded, setup, and running before continuing.
- Ensure you have a Smart Interface compatible with your Smart Probe and your computer running SYNC.

## Connecting your Strain Bridge


 **Note:** An M12-S-F-FM connector can be used to connect 4-wire bridge sensor to your SP-010.



	Name	Function
Pin 1	Exc -	Excitation return
Pin 2	Sense +	Bridge Output
Pin 3	Sense -	Bridge Output
Pin 4	Exc +	Bridge Excitation

## Connecting your Smart Probe & Interface


**Step 1:** Connect the SP-010 to your Smart Interface or wireless transmitter.

 **Note:** Locate the position of the keyway as a guide on the SP-010 prior to making the connection.

**Step 2:** Connect the Smart Interface or Wireless Transmitter to your computer.


## SYNC Auto-Detect

Once the SP-010 is connected to your computer, SYNC will automatically detect it and begin displaying temperature readings.

 **Note:** If you have successfully connected your SP-010 to SYNC, skip ahead to section **Configuring Load Cell**.

## SYNC Manual Connection

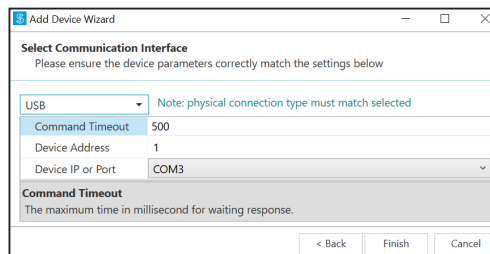
If SYNC does not automatically detect your device, follow these steps:

**Step 1:** Click on the  icon located on the top left of the SYNC interface.

**Step 2:** Select End Device / Probe and click **Next**.



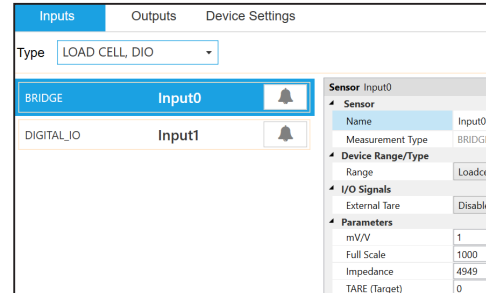
**Step 3:** Select your **Communication Interface** type from the dropdown and set your preferred Command Timeout, Device Address, and Device ID / Port.



**Step 4:** Click **Finish**.

## Configuring Load Cell

The SP-010 measures the bridge voltage to determine the applied force using bridge characteristics provided by the user. To configure the settings on your SP-010, follow these instructions:



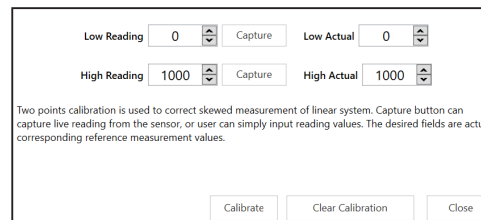
**Step 1:** Click the **Inputs Configuration Tab** on SYNC and select the **Load Cell** input type from the **Type** drop down.

Set the **Parameters** of your Load Cell to your preferred settings.

Parameter	Description
mV/V	Bridge output at full scale
Full Scale	Bridge Maximum load
Impedance	Bridge Impedance
TARE (Target)	Update this parameter to TARE bridge

## 2-Point Calibration

**Step 1:** From the **Load Cell Input** interface on SYNC, click **Calibrate**.




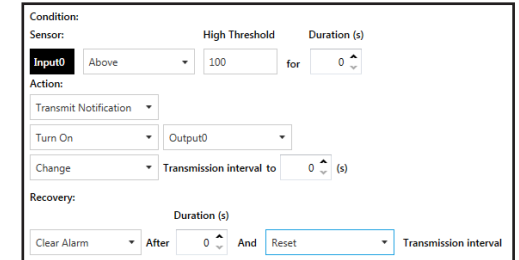
**Step 2:** Place your low reference and click **Capture** next to **Low Reading**. This will capture the measurement for the low reference in the low reading box. Enter your actual low reference weight in the **Low Actual** Box.

**Step 3:** Place your high reference and click **Capture** next to **Low Reading**. This will capture the measurement for the high reference in the high reading box. Enter your high reference weight in the High Actual Box.

**Step 4:** Click **Calibrate** to save your calibration.

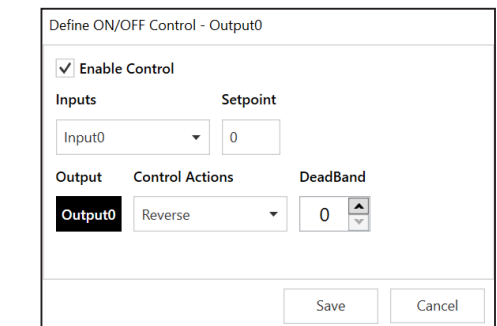
## Setting Alarms

Alarms are set by clicking the  icon in SYNC on the desired input signal found in the **Inputs** configuration tab. Setup the threshold and alarm type in the **Condition** section and then select which output to turn on in the **Action** section. The alarm can be set to be latching or non-latching in the **Recovery** section.



## ON/OFF Control

To configure ON/OFF Control on a device, navigate to the **Output Configuration Tab** in SYNC and click on the icon located to the right of the available outputs. Clicking the icon will open the **Define ON/OFF Control** dialog box as seen below. Choose the input with the active alarm that you would like to control and set your preferred parameters.



The **Setpoint** establishes the target process value and the **Deadband** establishes the range from the Setpoint that the process value can accept before the output is activated. When **Reverse** control is selected, the output is on when the process value is below the **Setpoint**. When **Direct** control is selected, the output is on when the process value is above the **Setpoint**. Once the ON/OFF Control parameters have been set, click save to finalize the settings.