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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.

Condition:

Sensor: Above for (s)

Action:

Transmit Notification

Turn On

Change (s)

Recovery:

Duration (s) And Transmission interval

Clear Alarm And Transmission interval

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.

Define ON/OFF Control - Output0

Enable Control

Inputs Setpoint

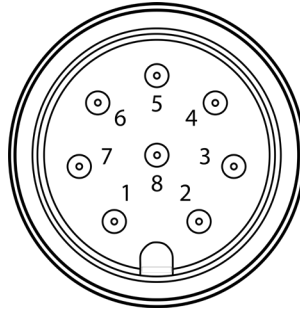
Output Control Actions DeadBand

Save Cancel

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.

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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_{DC} - 3.3 V_{DC}

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.

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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.

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QUICK START

CE

layer



SP-016
Heat Flux Smart Probe

OMEGA

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 Engineering Service: 1-800-872-9436 (USA & Canada only)
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For Other Locations Visit 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-016 Heat Flux Smart Probe. For additional information regarding your SP-016, refer to the User Manual available on the OMEGA website.

Materials

Included with your SP-016

- SP-016 Unit
- Quick Start Guide

Additional Materials Needed

- Layer N Smart Interface
- Computer/Laptop with Windows OS
- SYNC configuration software
 - Downloadable on the Omega website
- Heat Flux sensor such as OMEGA **HFS-5**
- M12-S-M-FM connector
 - Sold separately on the OMEGA website

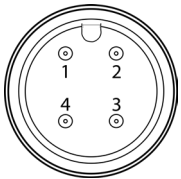
Before you Begin

To properly setup the SP-016, 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.

Heat Flux Sensor Connection

Use the provided 4-Pin wiring diagram to connect your heat flux sensor to your SP-016.



TC TempCO	
Pin 1	TC -
Pin 2	Thermopile +
Pin 3	Thermopile -
Pin 4	TC +

Connecting your Smart Probe & Interface

Step 1: Connect the SP-016 to your Layer N Smart Interface.

Note: Locate the position of the keyway as a guide on the SP-016 prior to making the connection.

Step 2: Connect the Smart Interface to your computer.


SYNC Auto-Detect

Once the SP-016 is connected to your computer, SYNC will automatically detect it and begin displaying temperature readings.

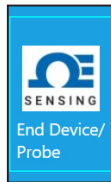
Note: If you have successfully connected your SP-016 to SYNC, skip ahead section **Heatflux Sensor Configuration**

SYNC Manual Connection

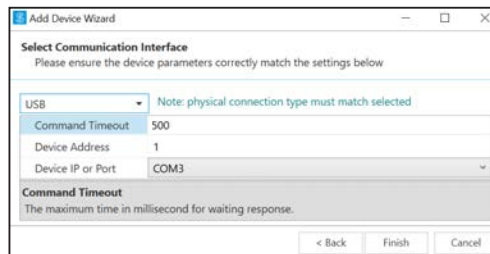
If SYNC does not automatically detect your device, follow these steps:

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

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



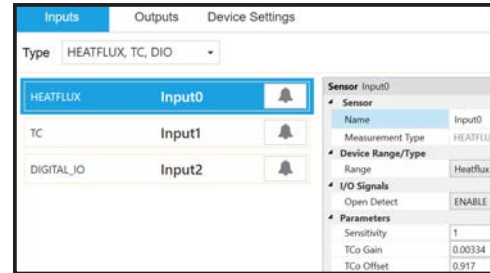
Step 3: Select your **Communication Interface** type from the dropdown and set your preferred Command Timeout, Device Address, and Device ID / Port.



Step 4: Click **Finish**.

Heat Flux Sensor Configuration

The SP-016 provides heat flux measurements in W/m². The SP-016 also offers discrete I/O. To use these features, follow these steps:



Step 1: Click the **Inputs** configuration tab on SYNC and choose the **Heatflux** input type from the **Type** drop down.

Note: Refer to your heat flux sensor data sheet for Sensitivity, Gain, and Offset values. Units for Sensitivity are measured in: **mV/(W/m²)**

To access the discrete I/O, click the relevant input type from the **Type** drop down that lists **DIO**.

Thermocouple Configuration

The SP-016 provides interfaces to type J, K, T, E, N, R, S, B, and C thermocouples with the capability of enabling or disabling the open detect feature. To use these features, follow these steps:



Step 1: Click the **Inputs** configuration tab on SYNC and choose an input type that includes **TC** from the **Type** drop down.

Step 2: Click the input you wish to configure and select your thermocouple type from the **Device Range/Type** drop down.

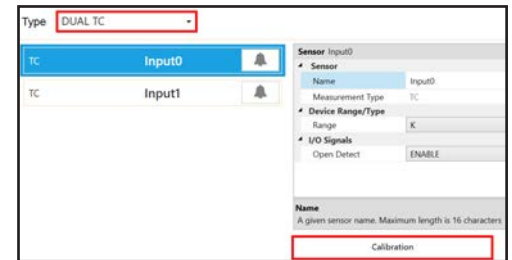
Step 3: Click the **Open Detect** drop down and choose to enable or disable it.

Type	Range	Accuracy
J	-210°C to 1200°C	0.4°C
K	160°C to 1372°C	0.4°C
T	190°C to 400°C	0.4°C
E	-220°C to 1000°C	0.4°C
N	-100°C to 1300°C	0.4°C
R	40°C to 1768°C	0.5°C
S	100°C to 1768°C	0.5°C
B	640°C to 1820°C	0.5°C
C	0°C to 2320°C	0.4°C

Cold Junction Calibration

The SP-016 has automatic Cold Junction Compensation and is factory calibrated so that in most cases it needs no adjustment. However, for increased accuracy, Cold Junction Calibration can be performed as described below.

Step 1: Ensure your thermocouple has been configured in the previous section and click **Calibration** beneath the input interface.



Step 2: Insert probe into 0°C reference and allow it to stabilize. Once the Thermocouple is stable in a 0°C (32°F) environment, click **Calibrate**.

