



## 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

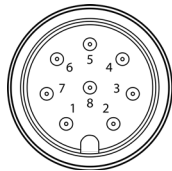
### GENERAL

**Agency Approvals:** CE, EMC

2014/30/EU, LVD 2014/35/EU

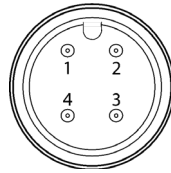
**Compatibility:** Compatible with OEG, SYNC configuration software, Layer N Cloud, and Modbus Networks

## M12 8-Pin Wiring



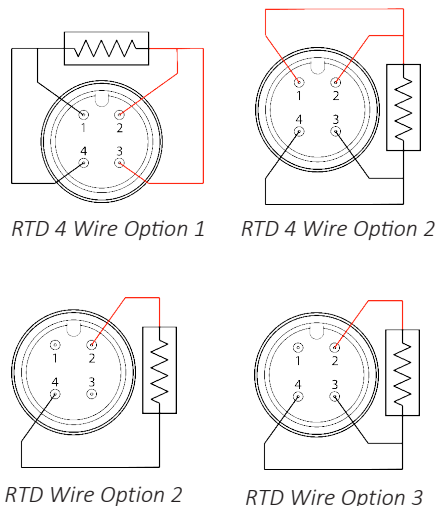
Pin	Name	Function
Pin 1	DIO 0	Discrete I/O Signal 0
Pin 2	INTR	Interrupt Signal
Pin 3	SCL	I2C Clock Signal
Pin 4	SDA	I2C Data Signal
Pin 5	Shield	Shield Ground
Pin 6	DIO 1	Discrete I/O Signal 1
Pin 7	GND	Power Ground
Pin 8	3.3VDD	Power Supply

## Thermocouple Wiring



Pin	Thermocouple
Pin 1	TC 2 Negative
Pin 2	TC 1 Positive
Pin 3	TC 1 Negative
Pin 4	TC 2 Positive

## RTD Wiring



RTD 4 Wire Option 1

RTD 4 Wire Option 2

RTD Wire Option 2

RTD Wire Option 3

## Thermocouple Types

Type	Range	Accuracy
J	-210°C to 1200°C	±0.2
K	-160°C to 1372°C	±0.2
T	-190°C to 400°C	±0.2
E	-200°C to 1000°C	±0.2
N	-100°C to 1300°C	±0.2
R	40°C to 1788°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	±0.8°C

Temperature Stability @ 25°C: 0.04 C/C

## RTD Types

Type	Range	Accuracy
385, 4 Wire	-200°C to 850°C	±0.1°C
385, 3 Wire	-200°C to 850°C	±0.1°C
385, 2 Wire	-200°C to 850°C	±0.6°C
392, 4 Wire	-200°C to 660°C	±0.1°C
392, 3 Wire	-200°C to 660°C	±0.1°C
392, 2 Wire	-200°C to 660°C	±0.6°C

Temperature Stability @ 25°C: 0.01 C/C

## Layer N SP-005

Model Number	Description
SP-005-1	Thermocouple and RTD Temperature Smart Probe with discrete I/O

## Layer N Smart Interface

Layer N Smart Probes require a Layer N Smart Interface to operate and connect to your Layer N Ecosystem. There are both wired and wireless options.

Model Number	Description
IF-001	USB Smart Interface
IF-002	RS485/Modbus Smart Interface

## Accessories

An optional M12 4-pin screw terminal adapter is available for users who wish to connect wire leads directly to the SP-005.

Model Number	Description
M12-S-M-FM	M12 4-pin screw terminal adapter
M12.8-T-SPLIT	Smart Probe M12-8 pin shielded T-Splitter - enables access to I/O pins
M12.8-S-M-FM	M12-8 pin Straight Plug Field install connector with screw terminals
DM12CAB-8-1-RA	1m (3.3') cable dual M12-8 connector, right angle terminator
DM12CAB-8-3-RA	3m (9.8') cable dual M12-8 connector, right angle terminator
DM12CAB-8-5-RA	5m (16.4') cable dual M12-8 connector, right angle terminator
DM12CAB-8-1	1m (3.3') cable dual M12-8 straight connector
DM12CAB-8-3	3m (9.8') cable dual M12-8 straight connector
DM12CAB-8-5	5m (16.4') cable dual M12-8 straight connector



M12 Series  
Thermocouple

+



SP-005-1

+



IF-001

## Thermocouple and RTD Probes

Omega recommends using the following supported thermocouple and RTD probes. Supported probes are not limited to those in this list.

### M12 TC Probes

M12 Series	J Type (Stainless Steel) / K Type (Inconel 600) 6" Thermocouple probes, single and dual element configuration, -50 to 85°C (-58 to 185°F) temp range, available in 1/8" or 1/4" diameter
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## Thermocouple and RTD Probes (continued)

### M12 TC Probes (continued)

M12M	J Type (Stainless Steel) / K Type (Inconel 600) multi-length Thermocouple probes, single and dual element configuration, -50 to 90°C (-58 to 194°F) temp range, available in 1/4" or 1/8" diameter
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### M12 TC Cables and Connectors

M12CM Series	Straight and right-angled M12 Field mountable connector sensor end, compensated thermocouple pins, IEC or ANSI color coded cable insulation options, variety of connection methods
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### M12 RTD Probes

PR-21A Series	6" RTD Probes, -50 to 250°C (-58 to 482°F) sensing end, 85°C (185°F) max at connector, Class A, Pt100, or PT1000 element, available in 1/4" or 1/8" probe diameter
PR-22 Series	Multi-Length RTD Probes, -30 to 350°C (-22 to 622°F) Class A probe temp range, -50 to 500°C (-58 to 932°F) Class B probe temp range, -50 to 90°C (-58 to 194°F) connector temp range, available in 1/4" or 1/8" diameter
PR-23 Series	Multi-Length RTD Probes, -30 to 350°C (-22 to 622°F) Class A probe temp range, -50 to 500°C (-58 to 932°F) Class B temp range, -50 to 90°C (-58 to 194°F) connector temp range, 1/8" diameter

### M12 RTD Cables and Connectors

M12C-PVC-4-S-M-R-F-2	M12, 4 pin Straight Plug to Angled Socket cable - 2m
M12C-PVC-4-S-M-R-F-5	M12, 4 pin Straight Plug to Angled Socket cable - 5m