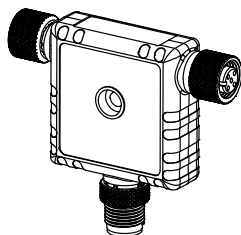
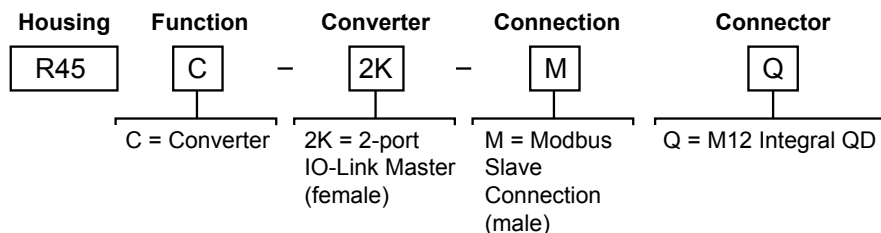


## Datasheet



- Connects two IO-Link devices and provides access via Modbus RTU interface
- Rugged design; easy installation with no assembly or individual wiring required
- 5-pin M12 male quick disconnect connector
- Two 4-pin M12 female quick disconnect connectors
- Built-in indication for two IO-Link master ports
- Built-in indication for Modbus RTU connection status
- Rugged over-molded design meets IP65, IP67, and IP68

## Models



## Overview

The R45C 2-Port Converter connects to two IO-Link devices and provides access to IO-Link data and functionality via a Modbus RTU connection.

Modbus registers allow for access to both IO-Link devices and their functions:

- Process Data In
- Process Data Out
- Connected device information
- ISDU data
- Discrete I/O configuration
- IO-Link events
- Data storage
- SIO mode

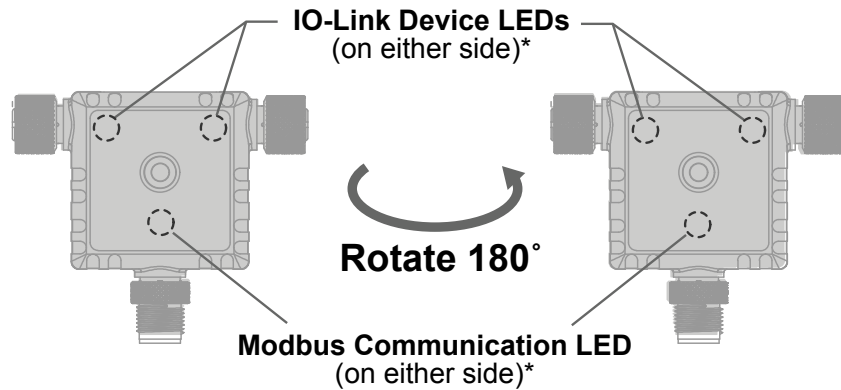
For more information, see p/n 221399 *IO-Link to ModBus Converter - Device Register Map*.



## Status Indicators

The R45C-2K-MQ IO-Link Master/Modbus Converter has matching RGB LED indicators on both sides for each IO-Link device port to allow for installation needs and still provide adequate indication visibility. There is also an Amber LED indicator on both sides of the converter, which is specific to the Modbus communication.

Figure 1. R45C 2-Port Converter status indicators – front and back



\* Indicator LEDs are visible through translucent housing

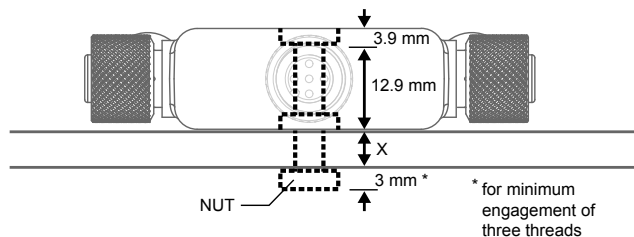
| IO-Link Device Port 1 and Port 2 RGB LEDs |                               | Modbus Communication Amber LED                   |   |
|---|-------------------------------|--|---|
| Indication                                | Status                        | Indication                                       | Status  |
| Off                                       | Deactivated port              | Flashing Amber (4 Hz)                            | Modbus communications are active  |
| Flashing Green                            | Waiting for IO-Link device    | Solid Amber (2 seconds) to Off                   | Modbus communications are lost after connection   |
| Solid Green                               | IO-Link device is connected   | Solid Amber (2 seconds) to Flashing Amber (4 Hz) | Modbus communications momentarily lost, but then reestablished  |
| Flashing Red                              | Validation Error              | Solid Amber                                      | Modbus communications are intermittent, or communications error occurs more frequently once every 2 seconds |
| Solid Yellow                              | Signal high in SIO-mode       | Off  | Modbus communications are not present   |
| Solid Blue                                | Processor communication error |  |   |

## Installation Instructions

### Mechanical Installation

Install the R45C 2-Port Converter to allow access for functional checks, maintenance, and service or replacement.

All mounting hardware is supplied by the user. Fasteners must be of sufficient strength to guard against breakage. Use of permanent fasteners or locking hardware is recommended to prevent the loosening or displacement of the device. The mounting hole (4.5 mm) in the R45C 2-Port Converter accepts M4 (#8) hardware. See the figure below to help in determining the minimum screw length.

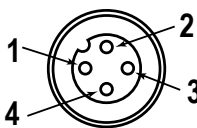


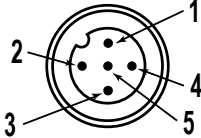
Screw Length (with screw head fitting in counterbore) = 12.9 mm + "X" mm + 3 mm



**CAUTION:** Do not overtighten the R45C 2-Port Converter's mounting screw during installation. Overtightening can affect the performance of the R45C 2-Port Converter.

## Wiring

| Port 1 and Port 2 – Female  | Pin | Signal Description                  |
|---|-----|-------------------------------------|
|  | 1   | 18 V DC to 30 V DC                  |
|   | 2   | I/Q (digital in-out)                |
|   | 3   | Ground                              |
|   | 4   | C/Q (communications/digital in-out) |

| Comm Port – Male  | Pin | Signal Description |
|---|-----|--------------------|
|  | 1   | 18 V DC to 30 V DC |
|   | 2   | RS485/D1/B/+       |
|   | 3   | Ground             |
|   | 4   | RS485/D0/A-        |
|   | 5   | Banner 1-wire      |

## Specifications

### Voltage Input Range

18 V DC to 30 V DC

### Input Power

24 V DC at 4A

### Output Power

24 V DC at 50 mA + 200 mA/port = 450 mA maximum

### Supply Protection Circuitry

Protected against reverse polarity and transient voltages

### Leakage Current Immunity

400 µA

### Indicators

RGB1: IO-Link Port 1 Status

RGB2: IO-Link Port 2 Status

Amber: Modbus Communications

### Connections

(2) Integral 4-pin M12 female quick disconnect

(1) Integral 5-pin M12 male quick-disconnect connector

### Construction

Coupling Material: Nickel-plated brass

Connector Body: PVC translucent black

### Vibration and Mechanical Shock

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 1.0 mm amplitude, 5 minutes sweep, 30 minutes dwell)

Meets IEC 60068-2-27 requirements (Shock: 30G 11 ms duration, half sine wave)

### Environmental Ratings

For Indoor Use Only

IP65, IP67, IP68, UL Type 1

### Operating Conditions

-40 °C to +70 °C (-40 °F to +158 °F)

90% at +70 °C maximum relative humidity (non-condensing)

**Storage Temperature:** -40 °C to +80 °C (-40 °F to +176 °F)

### IO-Link Baud Rates

COM1: 4.8 kbps

COM2: 38.4 kbps

COM3: 230.4 kbps

### Compliant Standards

IO-Link interface and System Specification v 1.1.2

IO-Link Test Specification v 1.1.2

### Master Communication Protocol

RS485 – Modbus RTU

### Digital Inputs (SIO [DI] Mode)

Input Current: 5 mA typical

ON Voltage/Current: 15 V DC minimum/5 mA minimum

OFF Voltage: 5 V DC maximum

### Digital Outputs (SIO [DO] Mode)

On-Resistance: 120 mΩ typical, 250 mΩ maximum

Current Limit: 0.7 A minimum, 1.0 A typical, 1.3 A maximum

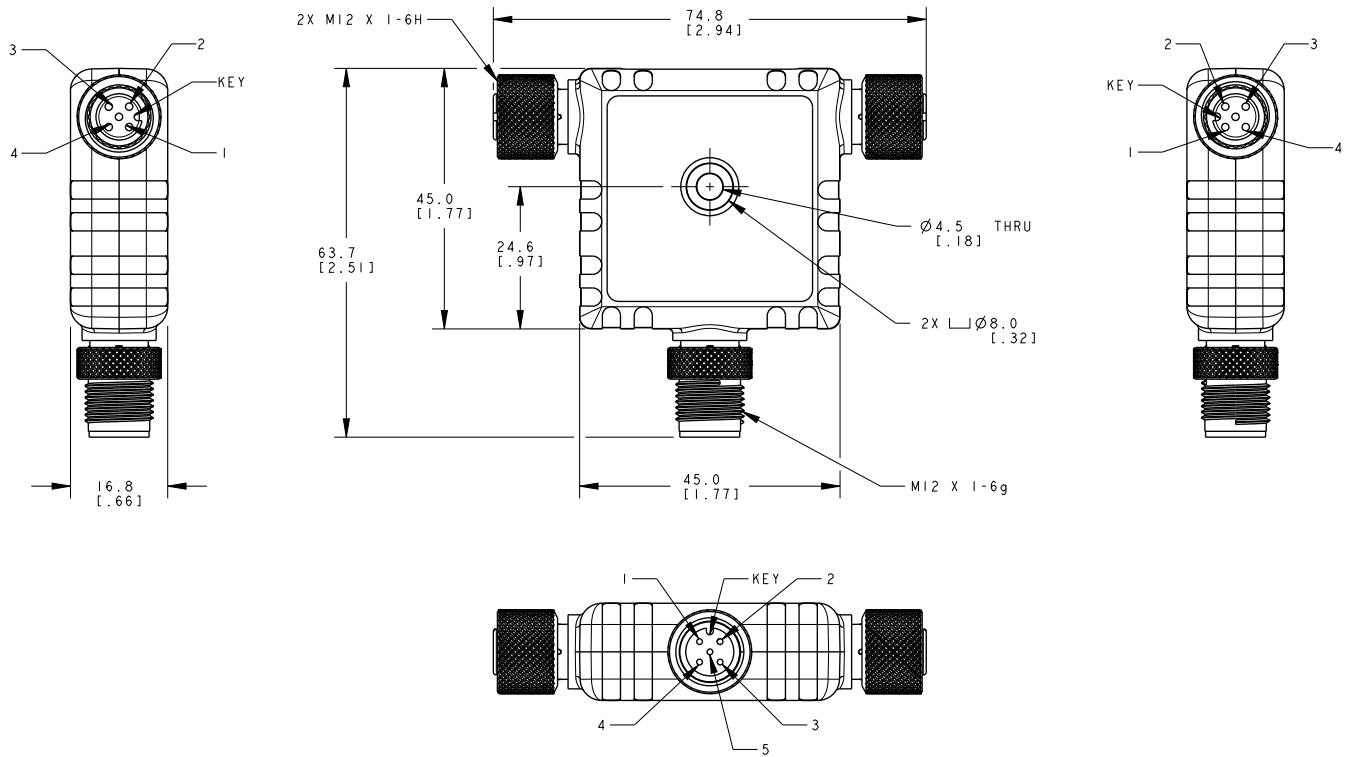
Off Leakage Current: -10 µA minimum, 10 µA maximum

### Certifications



## Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise.



## Accessories

### Cordsets

| 5-Pin Threaded M12 Cordsets—Double Ended |                  |                                   |            |                                    |                       |
|--|------------------|-----------------------------------|------------|------------------------------------|-----------------------|
| Model                                    | Length           | Style                             | Dimensions | Pinout (Male)                      | Pinout (Female)       |
| MQDEC-501SS                              | 0.31 m (1.02 ft) | Male Straight/<br>Female Straight |            |                                    |                       |
| MQDEC-503SS                              | 0.91 m (2.99 ft) |                                   |            |                                    |                       |
| MQDEC-506SS                              | 1.83 m (6 ft)    |                                   |            |                                    |                       |
| MQDEC-512SS                              | 3.66 m (12 ft)   |                                   |            |                                    |                       |
| MQDEC-515SS                              | 5 m (16.4 ft)    |                                   |            |                                    |                       |
| MQDEC-530SS                              | 9 m (29.5 ft)    |                                   |            |                                    |                       |
| MQDEC-550SS                              | 15 m (49.2 ft)   |                                   |            |                                    |                       |
|  |                  |                                   |            | 1 = Brown<br>2 = White<br>3 = Blue | 4 = Black<br>5 = Gray |

| 5-Pin Threaded M12 Cordsets—Double Ended |                  |                                  |            |                                    |                       |
|--|------------------|----------------------------------|------------|------------------------------------|-----------------------|
| Model                                    | Length           | Style                            | Dimensions | Pinout (Male)                      | Pinout (Female)       |
| MQDEC-501RS                              | 0.31 m (1.02 ft) | Male Right-angle/Female Straight |            |                                    |                       |
| MQDEC-503RS                              | 0.91 m (2.99 ft) |                                  |            |                                    |                       |
| MQDEC-506RS                              | 1.83 m (6 ft)    |                                  |            |                                    |                       |
| MQDEC-512RS                              | 3.66 m (12 ft)   |                                  |            |                                    |                       |
|  |                  |                                  |            | 1 = Brown<br>2 = White<br>3 = Blue | 4 = Black<br>5 = Gray |

| 4-Pin Threaded M12 Cordsets—Double Ended |                  |   |            |        |  |
|--|------------------|---|------------|--------|--|
| Model                                    | Length           | Style                                   | Dimensions | Pinout |  |
| MQDEC-401SS                              | 0.31 m (1 ft)    | Male Straight/<br>Female Straight       |            |        |  |
| MQDEC-403SS                              | 0.91 m (2.99 ft) |   |            |        |  |
| MQDEC-406SS                              | 1.83 m (6 ft)    |   |            |        |  |
| MQDEC-412SS                              | 3.66 m (12 ft)   |   |            |        |  |
| MQDEC-420SS                              | 6.10 m (20 ft)   |   |            |        |  |
| MQDEC-430SS                              | 9.14 m (30.2 ft) |   |            |        |  |
| MQDEC-450SS                              | 15.2 m (49.9 ft) |   |            |        |  |
| MQDEC-403RS                              | 0.91 m (2.99 ft) | Male Right-Angle/<br>Female Straight    |            |        |  |
| MQDEC-406RS                              | 1.83 m (6 ft)    |   |            |        |  |
| MQDEC-412RS                              | 3.66 m (12 ft)   |   |            |        |  |
| MQDEC-420RS                              | 6.10 m (20 ft)   |   |            |        |  |
| MQDEC-430RS                              | 9.14 m (30.2 ft) |   |            |        |  |
| MQDEC-450RS                              | 15.2 m (49.9 ft) |   |            |        |  |
| MQDEC-403RR                              | 0.9 m (2.9 ft)   | Male Right-Angle/<br>Female Right-Angle |            |        |  |
| MQDEC-406RR                              | 1.8 m (5.9 ft)   |   |            |        |  |
| MQDEC-412RR                              | 3.6 m (11.8 ft)  |   |            |        |  |
| MQDEC-420RR                              | 6.1 m (20 ft)    |   |            |        |  |

## Maintenance and Service

Do not use alcoholic cleaning agents. The R45C 2-Port Converter is maintenance-free.

## Banner Engineering Corp. Limited Warranty

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more sensors, more solutions