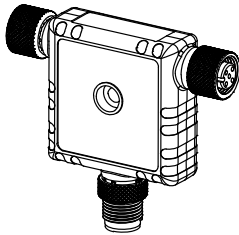


## Quick Start Guide

This guide is designed to help you set up and install the R45C-2K-MQ IO-Link Master/Modbus Converter. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at [www.bannerengineering.com](http://www.bannerengineering.com). Search for p/n 220214 to view the Instruction Manual. Use of this document assumes familiarity with pertinent industry standards and practices.



- 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

## 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

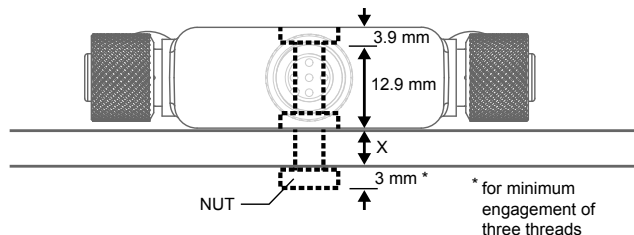
The R45C-2K-MQ IO-Link Master/Modbus Converter has matching RGB LED indicators on both sides for each IO-Link device port to allow for installation needs and still provide adequate indication visibility. There is also an Amber LED indicator on both sides of the converter, which is specific to the Modbus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

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		

## 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.

## 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  $\mu$ A

### 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

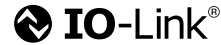
### Digital Inputs (SIO [DI] Mode)

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 m $\Omega$  typical, 250 m $\Omega$  maximum  
Current Limit: 0.7 A minimum, 1.0 A typical, 1.3 A maximum  
Off Leakage Current: -10  $\mu$ A minimum, 10  $\mu$ A maximum

### Certifications



## Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

**THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.**

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: [www.bannerengineering.com](http://www.bannerengineering.com).

For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).



more sensors, more solutions