R45C IO-Link to Dual Analog I/O Converter Product Manual

Features



- Compact IO-Link device to analog converter that outputs an analog value, voltage or current, as presented by the IO-Link master
- The converter also connects to an analog source, voltage or current, and outputs the value to the IO-Link master and as a representative PFM output
- 4-pin M12 male quick-disconnect connector supports IO-Link
- Two 4-pin M12 female quick-disconnect connectors that each support analog inputs and outputs
- Rugged overmolded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use

Models

Model Name	Function	Male Connector	Female 1 Connector	Female 2 Connector	Connection Type
R45C-KII-IIQ	Converter	IO-Link	Analog 1 Current In/Current Out	Analog 2 Current In/Current Out	Integral 4-pin M12 quick-disconnect connectors
R45C-KUU-UUQ			Analog 1 Voltage In/Voltage Out	Analog 2 Voltage In/Voltage Out	

Overview

Analog In

When this converter receives an analog input value, the numerical representational value is sent to an IO-Link Master via Process Data In (PDI).

PDI Analog Ranges:
- Voltage = 0 mV to 10,000 mV
- Current = 4,000 µA to 20,000 µA

PDO Outside Valid Range (POVR)

If the PDO value sent to this converter is outside of the PDO Analog Range value, then the actual analog output value will be set to one of the three selectable POVR levels after a 2-second delay:
- Low (default): 0 V or 3.5 mA
- High: 10.5 V or 20.5 mA
- Hold: Level retains previous value indefinitely

NOTE: If a connected IO-Link sensor is changed back to SIO mode, then the previous value will be held.

Analog Out

This converter also allows for the user to output an analog value by sending the numerical analog value from the IO-Link Master via Process Data Out (PDO).

PDO Analog Ranges:
- Voltage = 0 mV to 11,000 mV
- Current = 0 µA to 24,000 µA

PFM Out

Enables a PFM representation of an analog input as an output.

PFM Input Source Channel

Selects the analog input value from Port 1 or Port 2 as the PFM output source.

Pulse Frequency Configuration

Sets the near and far frequency values.

Original Instructions
25-Feb-26

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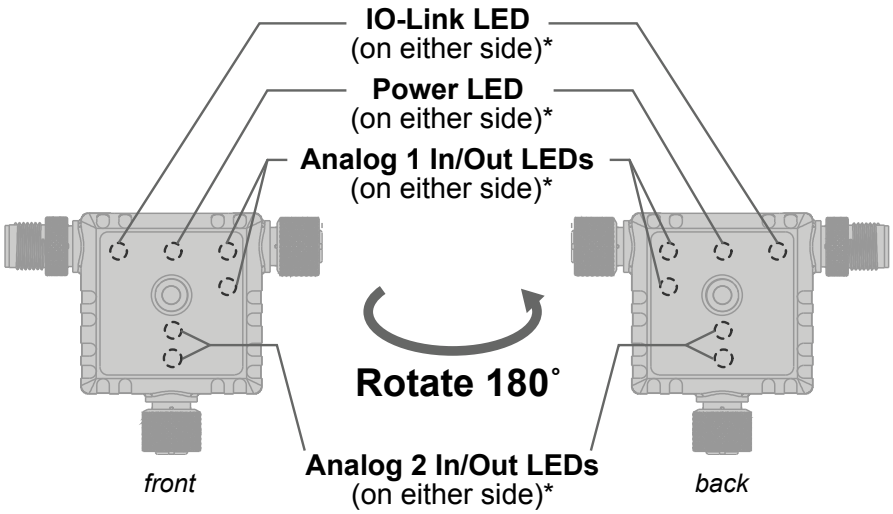
228480
p/n: 228480 Rev. C

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

Status Indicators

The R45C IO-Link to Dual Analog I/O Converter has four amber LED indicators on both sides for IO-Link and analog communications to allow for installation needs and still provide adequate indication visibility. There is also a green LED indicator on both sides of the converter, which signals the device's power status.

R45C status indicators – front and back



* Indicator LEDs are visible through translucent housing

IO-Link Amber LED

Indication	Status
Off	IO-Link communications are not present
Flashing Amber (900 ms On, 100 ms Off)	IO-Link communications are active

Analog In Amber LED

Indication	Status
Off	Analog current value is less than setpoint SP1 OR analog value is greater than setpoint SP2
Solid Amber	Analog current value is between setpoint SP1 AND setpoint SP2
Default Current Values: • SP1 = 0.004 A • SP2 = 0.02 A	Default Voltage Values: • SP1 = 0 V • SP2 = 10 V

Analog Out Amber LED

Indication	Status
Off	Turns off if written PDO analog value is outside the allowable output range
Solid Amber	Turns on if written PDO analog value is inside the allowable output range
Allowable Current Range: 0 mA to 24 mA	
Allowable Voltage Range: 0 V to 11 V	

Installation Instructions

Mechanical Installation

Install the R45C to allow access for functional checks, maintenance, and service or replacement. Do not install the R45C in such a way to allow for intentional defeat.

Fasteners must be of sufficient strength to guard against breakage. The 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 accepts M4 (#8) hardware.

See the figure below to help in determining the minimum screw length.

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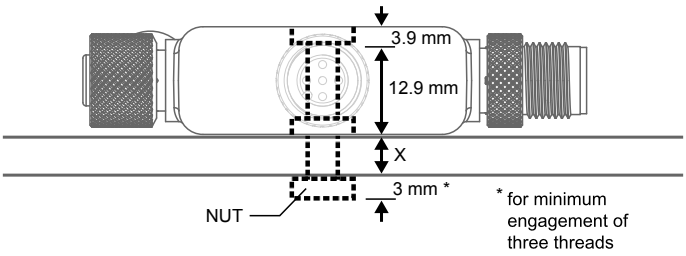
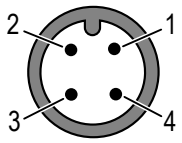
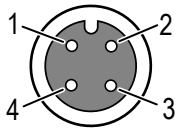


Screw Length (with screw head fitting in counterbore) = 12.9 mm + “X” mm + 3 mm

CAUTION: Do not overtighten the R45C's mounting screw during installation. Overtightening can affect the performance of the R45C.

Wiring

Male	Female	Pin	Wire Color
		1	Brown
		2	White
		3	Blue
		4	Black

Male (IO-Link Master)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	PFM/Banner-specific
Pin 3	Ground
Pin 4	IO-Link

Female (Analog 1)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	Analog 1 In
Pin 3	Ground
Pin 4	Analog 1 Out

Female (Analog 2)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	Analog 2 In
Pin 3	Ground
Pin 4	Analog 2 Out

IO-Link®

IO-Link® is a point-to-point communication link between a master device and a sensor and/or light. It can be used to automatically parameterize sensors or lights and to transmit process data. For the latest IO-Link protocol and specifications, please visit www.io-link.com.

For the latest IODD files, please refer to the Banner Engineering Corp website at: www.bannerengineering.com.

Configuration

The measured current value is available via Process Data as the measure value µA, and the voltage is available in mV.

For more information, see Banner P/N 228482 *R45C-KUUII-UUIIQ IO-Link Data Reference Guide* and Banner P/N 228483 *R45C-KUUII-UUIIQ IO-LINK IODD Files*.

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Specifications

Supply Voltage
18 V DC to 30 V DC at 50 mA maximum

Power Pass-Through Current
4 A maximum

Analog Input Impedance
Current version: Approximately 250 ohms
Voltage version: Approximately 14.3K ohms

Analog Output Load Resistance
Current version: 1 kilo-ohm maximum load resistance at 24 V DC
Maximum Load Resistance = [(Vcc - 4.5) ÷ 0.02 ohms]
Voltage version: 2.5 kilo-ohms minimum load resistance

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Leakage Current Immunity
400 µA

Accuracy
0.5%

Indicators
Green: Power
Amber: IO-Link communications
Amber: Analog input value present
Amber: Analog output value in range

Vibration and Mechanical Shock
Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 0.5 mm amplitude, 5 minutes sweep, 30 minutes dwell)
Meets IEC 60068-2-27 requirements (Shock: 15G 11 ms duration, half sine wave)

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN

Resolution
14 bits

Connections
Integral 4-pin M12 male/female quick-disconnect connectors

Construction
Coupling Material: Nickel-plated brass
Connector Body: PVC translucent black

Environmental Rating
IP65, IP67, IP68
UL Type 1

Operating Conditions
Temperature: –40 °C to +60 °C (–40 °F to +140 °F)
90% at +60 °C maximum relative humidity (non-condensing)
Storage Temperature: –40 °C to +80 °C (–40 °F to +176 °F)

Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

FCC Part 15 Class B for Unintentional Radiators

(Part 15.105(b)) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada ICES-003(B)

This device complies with CAN ICES-3 (B)/NMB-3(B). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

Cet appareil est conforme à la norme NMB-3(B). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

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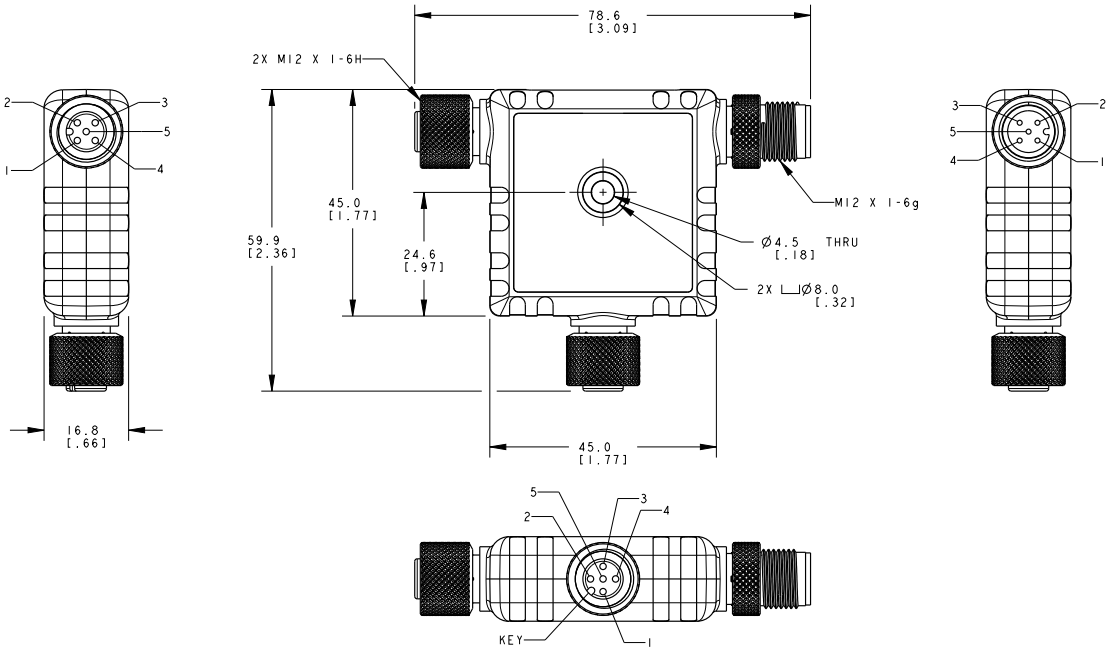
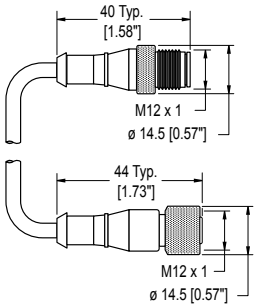
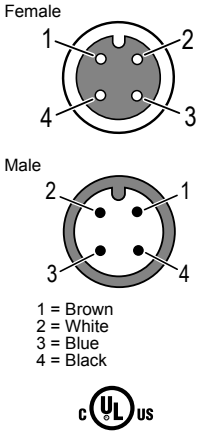
Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.



Accessories

Cordsets

4-Pin Double-Ended M12 Female to M12 Male Cordsets				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-401SS	0.31 m (1 ft)	Male Straight/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-415SS	4.58 m (15 ft)			
MQDEC-420SS	6.10 m (20 ft)			
MQDEC-430SS	9.14 m (30.2 ft)			
MQDEC-450SS	15.2 m (49.9 ft)			

Product Support and Maintenance

Clean with Mild Detergent and Warm Water

Wipe down the device with a soft cloth dampened with a mild detergent and warm water solution. Do not use any other chemicals for cleaning.

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Repairs

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

> **IMPORTANT:** If instructed to return the device, pack it with care. Damage that occurs in return shipping is not covered by warranty.

Contact Us

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For worldwide locations and local representatives, visit www.bannerengineering.com.

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