BANNER R45C RSD to Analog Output Converter Instruction Manual

Contents

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Instruction Manual

- Compact converter that reads sensor distance over RSD communications and outputs a voltage or current analog value
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use

Models

Housing	Function		Male		Female	Connector
R45	C	-	RSDW	-	I	Q
	C = Converter		RSDW = Converter communicates over Pin 2 (White Wire) using the RSD communications protocol RSDG = Converter communicates over Pin 5 (Gray Wire) using the RSD communications protocol		I = Analog Current Out U = Analog Voltage Out	Q = Integral M12 quick disconnect

The R45C-RSDW-xx converter models are compatible with the following sensors:

Sensor	Versions
Q5XKLAF5000-Q8	V3.0 build and later
Q5XKLAF2000-Q8	V4.0 build and later

The R45C-RSDG-xx converter models are compatible with the following sensors:

Sensor	Versions	Connection
Q5XKLAF5000-Q8	V3.0 build and later	MQDC-4501SS crossover cable required
Q5XKLAF2000-Q8	V4.0 build and later	

Overview

The R45C RSD to Analog Output Converter connects to a distance sensor, and over the RSD communications

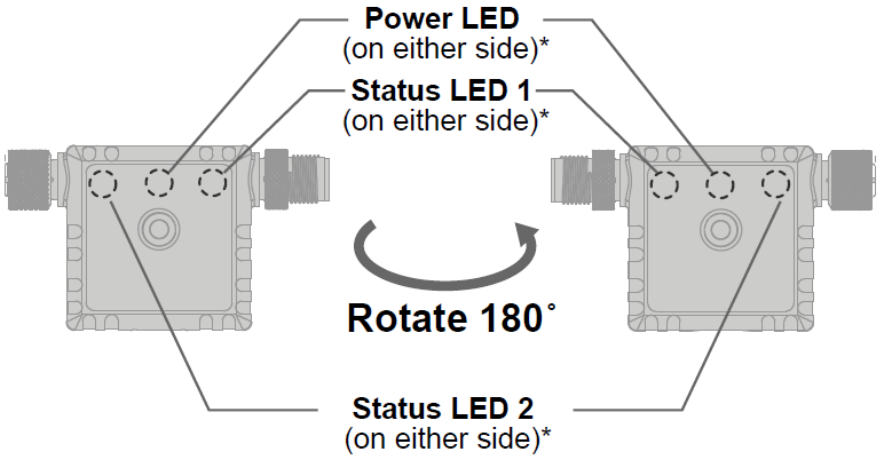
link, receives the sensor's calculated distance. That distance is converted to an analog value for host side consumption.

- Voltage range is 0 V to 10 V
- Current range is 4 mA to 20 mA

Status Indicators

The R45C RSD to Analog Output Converter has two amber LED indicators on both sides for connected sensor status and provides adequate indication visibility. There is also a green LED indicator on both sides of the converter, which signals the device's power status.

Figure 1. R45C status indicators – front and back



* Indicator LEDs are visible through translucent housing

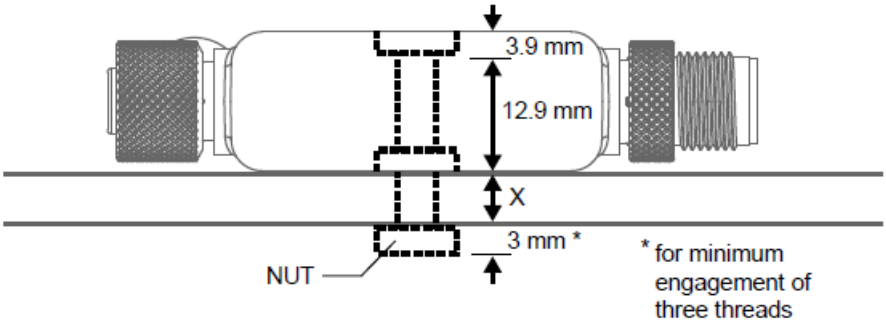
Status 1 LED – Amber	
Indication	**Status**
Solid On/Off	Follows status of LED 1 of connected sensor
Flash at 1 Hz rate	Powered on, no sensor connected
Flash at 4 Hz rate, alternating with Status 2 LED	Powered on, sensor connected, but sensor is not RSD capable

Status 2 LED – Amber	
Indication	**Status**
Solid On/Off	Follows status of LED 2 of connected sensor
Flash at 1 Hz rate	Powered on, no sensor connected
Flash at 4 Hz rate, alternating with Status 1 LED	Powered on, sensor connected, but sensor is not RSD capable

Installation

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. 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 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

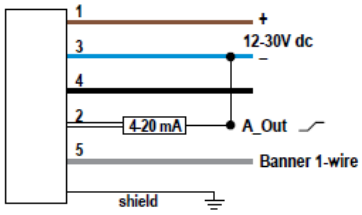
CAUTION: Do not overtighten the R45C’s mounting screw during installation. Overtightening can affect the performance of the R45C.

Connection Options

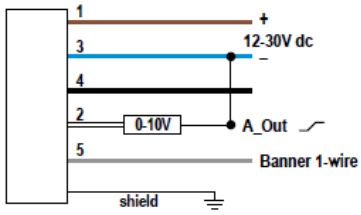
- When connecting the R45C to a sensor or control system, an adapter may be required depending on the sensor.
- For the R45C-RSDG-xx, Pin 5 (gray wire) is used to communicate with an attached sensor.
- For the R45C-RSDW-xx, Pin 2 (white wire) is used to communicate with an attached sensor.

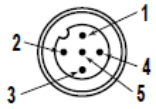
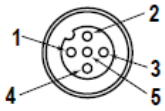
Wiring
The following wiring diagrams are examples of different R45C outputs. Wiring is dependent on the sensor connected to the R45C.

Analog (Current)



Analog (Voltage)



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

Female (RSDG)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	No Connection (N/C)
Pin 3	Ground
Pin 4	Pass-through to Pin 4 (Male)
Pin 5	Banner RSD communications

Female (RSDW)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	Banner RSD communications
Pin 3	Ground
Pin 4	Pass-through to Pin 4 (Male)
Pin 5	No Connection (N/C)

Male (Analog Output)	Signal Description
Pin 1	18 V DC to 30 V DC
Pin 2	Analog Out
Pin 3	Ground
Pin 4	Pass-through to Pin 4 (Female)
Pin 5	Banner 1-wire

Specifications

Supply Voltage

- 18 V DC to 30 V DC at 50 mA maximum

Supply Protection Circuitry

- Protected against reverse polarity and transient voltages

Leakage Current Immunity

- 400 µA

Resolution

- 14 bits

Accuracy

- 0.5%

Indicators

- **Green:** Power LED
- **Amber:** Status 1 LED
- **Amber:** Status 2 LED

Connections

- Integral male/female 5-pin M12 quick disconnect

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, 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 Europe Park Lane, Culliganlaan 2F bus 3, 1831 Diegem, BELGIUM Turck Banner LTD Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain

Environmental Rating

- IP65, IP67, IP68
- NEMA/UL Type 1

Operating Conditions

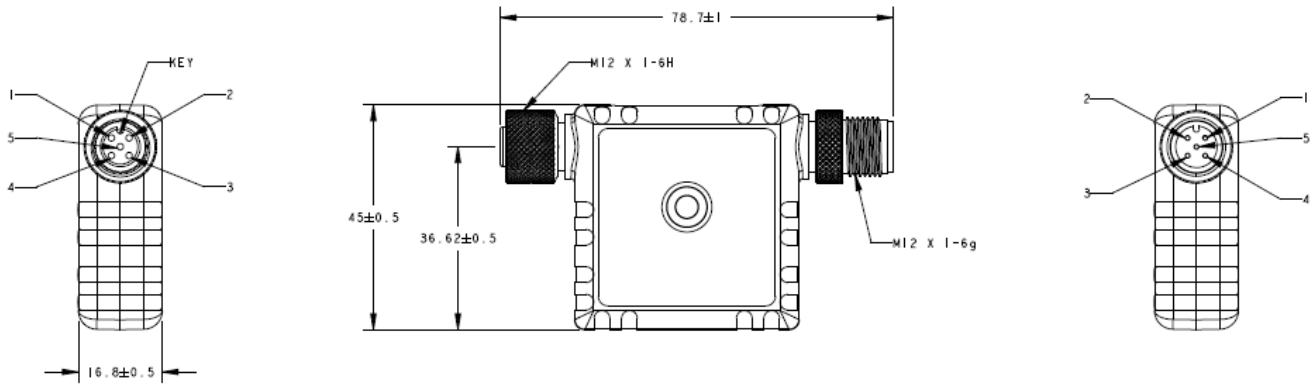
- **Temperature:** –40 °C to +70 °C (–40 °F to +158 °F) 90% at +70 °C maximum relative humidity (non-condensing)
- **Storage Temperature:** –40 °C to +80 °C (–40 °F to +176 °F)

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 (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

Dimensions

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

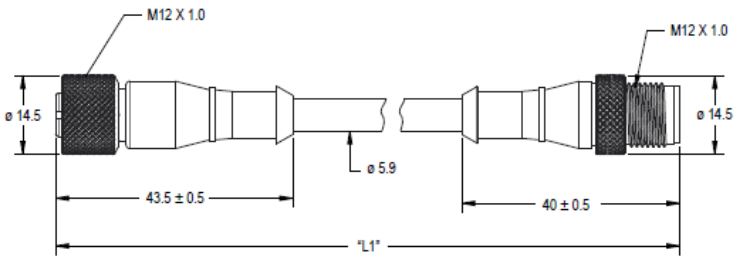
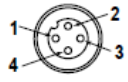


Accessories

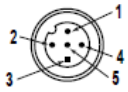
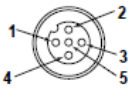
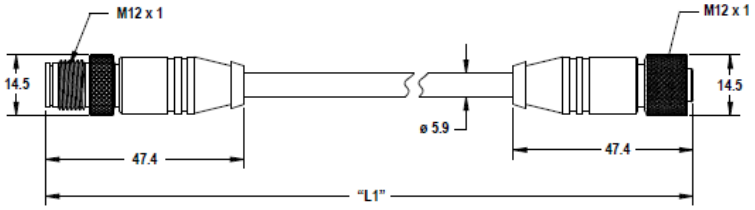
Cordsets

The following cordsets can be used to connect the R45C-RSDG-xx to a 4-pin sensor where the white wire (pin 2) is used for communication (for example, Q5XLAF5000 and Q5XLAF2000 sensors).

4-Pin Female and 5-Pin Male Threaded M12 Cordset—Double Ended

Model	Length "L1"	Style	Pinout
MQDC-4501SS	0.30 m (0.98 ft)	Female Straight/ Male Straight	Male  1 = Brown 2 = Not Used 3 = Blue 4 = Black 5 = White
MQDC-4506SS	1.83 m (6.00 ft)		
			Female  1 = Brown 2 = White 3 = Blue 4 = Black

The following cordsets can be used to extend the distance between the sensor and the R45C-RSDG-xx or R45C-RSDW-xx.

5-Pin Male Threaded and 5-Pin Female Quick Disconnect M12 Cordset with Shield—Double Ended				
Model	**Length "L1"**	**Style**	**Pinout (Male)**	**Pinout (Female)**
MQDEC3-503SS	0.91 m (2.99 ft)	Female Straight/Male Straight		
MQDEC3-506SS	1.83 m (6 ft)			
MQDEC3-515SS	4.58 m (15 ft)			
MQDEC3-530SS	9.2 m (30.2 ft)			
			1 = Brown 2 = White 3 = Blue	4 = Black 5 = Gray

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For patent information, see **www.bannerengineering.com/patents.**

FCC

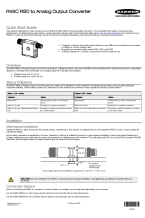
This device complies with Part 15 of the FCC Rules. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada

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.

Documents / Resources

	**BANNER R45C RSD to Analog Output Converter** [pdf] Instruction Manual R45C RSD to Analog Output Converter, R45C, RSD to Analog Output Converter, Analog Output Converter, Output Converter, Converter
	**BANNER R45C RSD to Analog Output Converter** [pdf] User Guide R45C RSD to Analog Output Converter, R45C, RSD to Analog Output Converter, Analog Output Converter, Output Converter, Converter

References

- Banner Engineering
- Patents