R45C Modbus® to Dual Analog Input-Output Converter Quick Start Guide

Features

This guide is designed to help you set up and install the R45C ModBus to Dual Analog Input-Output Converter. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at www.bannerengineering.com. Search for part number 232576 to view the Instruction Manual. Use of this document assumes familiarity with pertinent industry standards and practices.

Overview

Analog In
When an analog input value is received by this converter, the numerical representational value is sent to the appropriate ModBus register.

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

Analog Out
This converter also allows for the user to output an analog value by sending the numerical analog value by entering the analog value into the appropriate ModBus register.

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

PDO Outside Valid Range (POVR)
If the Process Data Out (PDO) value sent to this converter is outside of the PDO Analog Range value, then the actual analog output value will be set to the 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

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.

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

Status Indicators

The R45C ModBus to Dual Analog Input-Output 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.

ModBus Amber LED

Indication	Status
Off	ModBus communications are not present
Flashing Amber (4 Hz)	ModBus communications are active
Solid for 2 Seconds to Off	ModBus communications are lost after connection
Solid for 2 Seconds to Flashing Amber (4 Hz)	ModBus communications momentarily lost, but communication reestablished

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	

Specifications

Supply Voltage
12 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%

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)

Resolution

14 bits

Connections

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

(2) Integral 4-pin M12 female quick-disconnect connector

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)

Product Identification

SNAP SIGNAL®

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	1.0	30	0.5

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

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