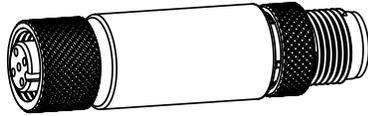


S15C Modbus Master to IO-Link Device Converter for Vibration and Temperature

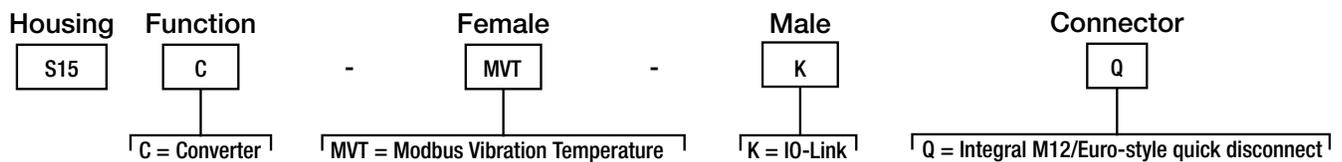


Datasheet



- Compact ModBus master to IO-Link device converter for use with QM30VT2 Vibration and Temperature sensor
- Predefined ModBus registers are sent over IO-Link automatically
- Rugged over-molded design meets IEC IP65, IEC IP67, and IEC IP68
- Connects directly to a sensor or anywhere in-line for ease of use

Models



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.

Process Data In (Device to Master)

The S15C converter provides for the reading of three user-selectable sets of 15 Modbus Registers.

For more information, see Banner P/N 210732 *Sure Cross® QM30VT2 Vibration and Temperature Sensor*, Banner P/N 217177 *S15C Modbus Converter (Vibration and Temperature) - IO-Link Data Reference Guide*, and Banner P/N 217160 *S15C-MVT-KQ IODD Files*.

RegSet 0

Register Set 0 reads the following Modbus Registers with Imperial System values as applicable:

| RegSet 0 | | |
|------------|-------|---|
| Reg Adr 01 | 45201 | Z-Axis RMS Velocity (in/sec) |
| Reg Adr 02 | 45203 | Temperature (°F) |
| Reg Adr 03 | 45205 | X-Axis RMS Velocity (in/sec) |
| Reg Adr 04 | 45207 | Z-Axis RMS Peak Acceleration (G) |
| Reg Adr 05 | 45208 | X-Axis RMS Peak Acceleration (G) |
| Reg Adr 06 | 45209 | Z-Axis Peak Velocity Component Frequency (Hz) |
| Reg Adr 07 | 45210 | X-Axis Peak Velocity Component Frequency (Hz) |
| Reg Adr 08 | 45213 | Z-Axis Kurtosis |
| Reg Adr 09 | 45214 | X-Axis Kurtosis |
| Reg Adr 10 | 45215 | Z-Axis Crest Factor |
| Reg Adr 11 | 45216 | X-Axis Crest Factor |
| Reg Adr 12 | 45217 | Z-Axis Peak Velocity (in/sec) |
| Reg Adr 13 | 45219 | X-Axis Peak Velocity (in/sec) |
| Reg Adr 14 | 45221 | Z-Axis High-Frequency RMS Acceleration (G) |
| Reg Adr 15 | 45222 | X-Axis High-Frequency RMS Acceleration (G) |



RegSet 1

Register Set 1 reads the following Modbus Registers with Metric System values as applicable:

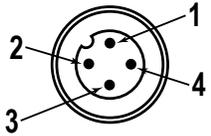
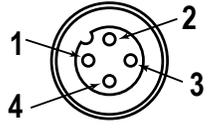
| RegSet 1 | | |
|------------|-------|---|
| Reg Adr 01 | 45202 | Z-Axis RMS Velocity (mm/sec) |
| Reg Adr 02 | 45204 | Temperature (°C) |
| Reg Adr 03 | 45206 | X-Axis RMS Velocity (mm/sec) |
| Reg Adr 04 | 45207 | Z-Axis RMS Peak Acceleration (G) |
| Reg Adr 05 | 45208 | X-Axis RMS Peak Acceleration (G) |
| Reg Adr 06 | 45209 | Z-Axis Peak Velocity Component Frequency (Hz) |
| Reg Adr 07 | 45210 | X-Axis Peak Velocity Component Frequency (Hz) |
| Reg Adr 08 | 45213 | Z-Axis Kurtosis |
| Reg Adr 09 | 45214 | X-Axis Kurtosis |
| Reg Adr 10 | 45215 | Z-Axis Crest Factor |
| Reg Adr 11 | 45216 | X-Axis Crest Factor |
| Reg Adr 12 | 45218 | Z-Axis Peak Velocity (mm/sec) |
| Reg Adr 13 | 45220 | X-Axis Peak Velocity (mm/sec) |
| Reg Adr 14 | 45221 | Z-Axis High-Frequency RMS Acceleration (G) |
| Reg Adr 15 | 45222 | X-Axis High-Frequency RMS Acceleration (G) |

RegSet 2

Register Set 2 reads the following Modbus Registers specific to sensor information:

| RegSet 2 | | |
|------------|-------|---------------------------------|
| Reg Adr 01 | 44101 | Serial Number Upper |
| Reg Adr 02 | 44102 | Serial Number Lower |
| Reg Adr 03 | 44103 | Model Number Upper |
| Reg Adr 04 | 44104 | Model Number Lower |
| Reg Adr 05 | 44105 | Production Date Upper |
| Reg Adr 06 | 44106 | Production Date Lower |
| Reg Adr 07 | 44301 | RF Firmware Part Number Upper |
| Reg Adr 08 | 44302 | RF Firmware Part Number Lower |
| Reg Adr 09 | 44303 | RF Firmware Version Upper |
| Reg Adr 10 | 44304 | RF Firmware Version Lower |
| Reg Adr 11 | 44305 | RF Firmware Version Engineering |
| Reg Adr 12 | 44306 | RF EEPROM Part Number Upper |
| Reg Adr 13 | 44307 | RF EEPROM Part Number Lower |
| Reg Adr 14 | 44308 | RF EEPROM Version Upper |
| Reg Adr 15 | 44309 | RF EEPROM Version Lower |

Wiring Diagrams

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

| Female (Sensor) | Signal Description |
|-----------------|--------------------|
| Pin 1 | 18 V DC to 30 V DC |
| Pin 2 | RS485/D1/B/+ |
| Pin 3 | Ground |
| Pin 4 | RS485/D0/A/- |

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

Status Indicators

Power LED Indicator (Green)

- Solid Green = Power On
- Off = Power Off

IO-Link Communication LED Indicator (Amber)

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

Modbus Communication LED Indicator (Amber)

- Flashing Amber (4 Hz) = Modbus communications are active
- Solid Amber for 2 seconds to Off = Modbus communications are lost after connection
- Solid Amber for 2 seconds to Flashing Amber (4 Hz) = Modbus communications momentarily lost, but communication reestablished
- Solid Amber = Modbus communications are intermittent, or communications error occurs more frequently than once every 2 seconds
- Off = Modbus communications are not present

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 μ A

Indicators

Green power
Amber IO-Link communications
Amber ModBus communications

Connections

Integral male/female 4-pin M12/Euro-style 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



Environmental Rating

IEC IP65, IEC IP67, IEC 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



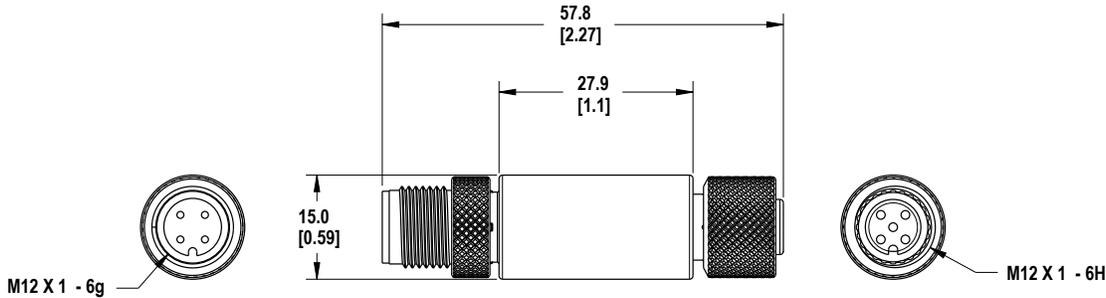
WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

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

| 4-Pin Threaded M12/Euro-Style Cordsets—Double Ended | | | | |
|---|------------------|-----------------------------------|------------|---|
| Model | Length | Style | Dimensions | Pinout |
| MQDEC-401SS | 0.31 m (1 ft) | Male Straight/ Female Straight | | Female |
| MQDEC-403SS | 0.91 m (2.99 ft) | | | |
| MQDEC-406SS | 1.83 m (6 ft) | | | Male |
| 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) | | | 1 = Brown 2 = White 3 = Blue 4 = Black |

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.**

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

FCC Part 15 and CAN ICES-3 (B)/NMB-3(B)

This device complies with part 15 of the FCC Rules and 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.

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 and CAN ICES-3 (B)/NMB-3(B). 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 manufacturer.



more sensors, more solutions