S15C Thermistor Temperature Probe to Modbus® Converter

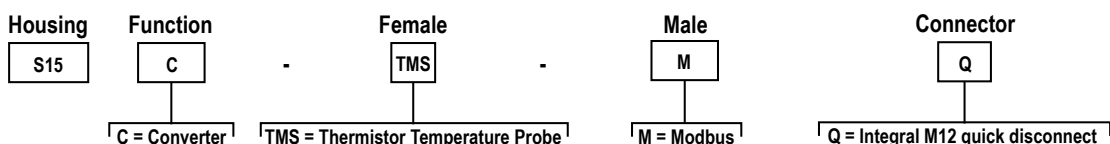**BANNER** ®
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Datasheet
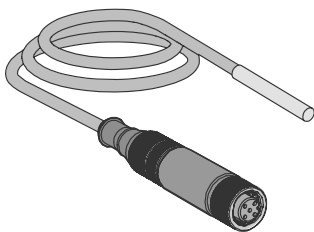
- Compact converter that connects to a thermistor probe and outputs the value to Modbus® registers
- Thermistors are used as temperature sensors and are an accurate and cost-effective sensor for measuring temperatures in various applications
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use

Models

Housing	Function		Female		Male		Connector
S15	C	-	TMS	-	M		Q
	C = Converter		TMS = Thermistor Temperature Probe		M = Modbus		Q = Integral M12 quick disconnect

The converter comes with the following included: Thermistor with 2.9 m cable and M12 Quick Disconnect.

Configuration Instructions

Sensor Configuration Software

The Sensor Configuration Software offers an easy way to manage converter Modbus settings, retrieve data, and visually show converter data. The Sensor Configuration Software runs on any Windows machine and uses an adapter cable (BWA-UCT-900, p/n 19970) to connect the converter to the computer.

Download the most recent version of the Sensor Configuration Software from the Banner Engineering website: https://info.bannerengineering.com/cs/groups/public/documents/software/b_3128586.exe.

Modbus Configuration

Modbus Register Address	Type	Name	I/O Range	Description	Notes	Default
IO Data Out						
40001	int16, Read Only	IO Data	Temperature °C (°F) = -4000 to +10500 (-4000 to +22100) Thermistor Resistance = 70 to 23980	Analog Data output [1]	Temperature °C/°F = Data Output ÷ 100 Thermistor Resistance = Data Output × 10	-
40002	int16, Read Only	IO Alarm State	-	-	0 = Within threshold range 1 = Out of threshold range	-
40003	int16, Read Only	IO Error Status	STATUS_ERROR_TYPE_NO_ERROR = 0 STATUS_ERROR_TYPE_BELOW_MIN = 1 STATUS_ERROR_TYPE_ABOVE_MAX = 2 STATUS_ERROR_TYPE_INVALID_THERM_OUTPUT = 3 STATUS_ERROR_TYPE_INVALID_THERM_TYPE = 4	Status of program	0-4 value	-
IO Data Rate						
41201	int16, Read and Write	Sample IO	-	Sample interval time for IO	Minimum rate: 62.5 ms (0x01)	**0x10 (1 sec)**
Thermistor Input 1						

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[1] IO Data readings below the minimum or above the maximum readings (see I/O range at register address 40001) rails to –32768 or 32767, respectively.

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Modbus Register Address	Type	Name	I/O Range	Description	Notes	Default
41006	uint16, Read and Write	Thermistor curve Type	THERM_TYPE_G_CURVE = 0 THERM_TYPE_J_CURVE = 1	Selects which Thermistor type is utilized.	0 - 1 value, **Thermistor Only**	**0**
41007	uint16, Read and Write	Output Type	THERM_OUTPUT_TYPE_C = 0 THERM_OUTPUT_TYPE_F = 1 THERM_OUTPUT_TYPE_RES = 2	Select which data value (Celsius, Fahrenheit, or Resistance) to output to IO 1 data (40001)	0 - 2 value	**0**
			COMs Settings			
46101	Baud Rate	-	0 = 9.6k 1 = 19.2k 2 = 38.4k	-	-	**1**
46102	Parity	-	0 = None 1 = Odd 2 = Even	-	-	**None**
46103	Modbus Slave Address	-	1 to 247	-	-	**1**

Wiring Diagrams
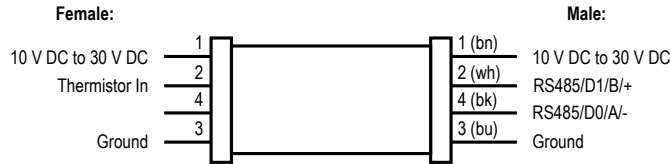
Male (Gateway)	Female (Sensor)	Pin	Wire Color
		1	Brown
		2	White
		3	Blue
		4	Black

⭐ **Important:** If using a cable to connect the converter to an analog sensor, use of a shielded M12 cable is recommended, with the shield tied to pin 3.

Status Indicators

Power LED Indicator (Green)
- Solid Green = Power On
- Off = Power Off

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
10 V DC to 30 V DC at 50 mA maximum

Power Pass-Through Current
4 A maximum

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Leakage Current Immunity
400 µA

Resolution
12-bits

Accuracy
± 1.5 °C (± 3 °F)

Indicators
Green power
Amber Modbus communications

Connections
Integral male/female 4-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

CE

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

UKCA

Turck Banner LTD Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain

c(UL)us LISTED

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.
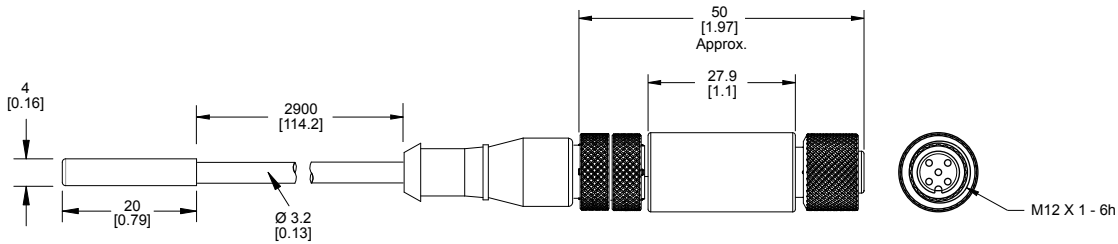Supply wiring leads < 24 AWG shall not be spliced.
For additional product support, go to www.bannerengineering.com.

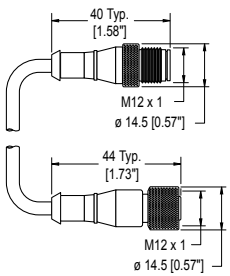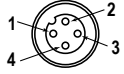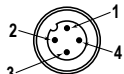| Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

Dimensions

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

Accessories

Cordsets

4-Pin Threaded M12 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)			
MQDEC-412SS	3.66 m (12 ft)			
MQDEC-420SS	6.10 m (20 ft)			Male
MQDEC-430SS	9.14 m (30.2 ft)			
MQDEC-450SS	15.2 m (49.9 ft)			1 = Brown 2 = White 3 = Blue 4 = Black

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

FCC Part 15 Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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 of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

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