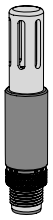
S15S Temperature and Humidity Sensor

Features

The Temperature and Temperature/Humidity Sensor works in a variety of environments to provide temperature and humidity measurements.



- Connects via RS485 Modbus® registers
- Rugged overmolded design
- Ships with aluminum grill filter cap
- Optional stainless steel 10 µm sintered filter available separately

Models

Model Number	Function	Control	Connector
S15S-TH-MQ	Female connector: Temperature and humidity sensor	Male connector: Modbus	Integral 4-pin M12 male/female quick-disconnect connectors

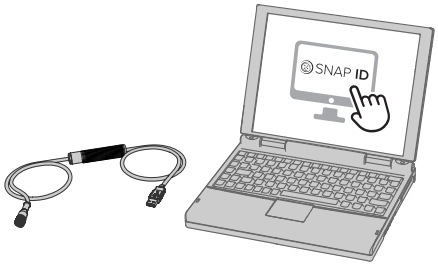
Configuration Instructions

SNAP SIGNAL Configuration Software

Banner's SNAP SIGNAL Configuration Software offers an easy way to configure and demonstrate Banner Modbus devices.

Users have full control of device configuration, the ability to visualize device data, and to demonstrate device features. The easy-to-use software provides a variety of tools and works with Banner Modbus devices.

- Allows for the configuration and demo of Banner Modbus devices
- Free to download and available on the Banner website at https://www.bannerengineering.com/sg/en/products/software/snap-signal-configuration-software.html
- Works on Microsoft® Windows® 7 and 10[1]
- BWA-UCT-900 cable required to connect PC-based SNAP SIGNAL Configuration Software to Banner Modbus devices



S15S Modbus Configuration

Sensor Data - Read Only

Sensor Address	Description	I/O Range		Holding Register Registration	
		Min Value	Max Value	Min (Dec)	Max (Dec)
40001	Humidity (%RH)	0	100%	0	10000
40002	Temperature (°C)	-1638.4	1638.3	-32768	32767
40003	Temperature (°F)				
40004	Dew Point (°C)				
40005	Dew Point (°F)				

The temperature = (Modbus register value) ÷ 20. The humidity = (Holding register value) ÷ 100. The dew point = (Holding register value) ÷ 100.

COMs Settings

Sensor Address	Description	I/O Range	Comments	Default	Access
40601	Baud Rate	0 = 9.6k 1 = 19.2k 2 = 38.4k	0 = 9600 1 = 19200 2 = 38400	1	RW
40602	Parity	0 = None 1 = Odd 2 = Even	0 = None 1 = Odd 2 = Even	0	RW

Continued on page 2

[1] Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

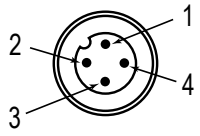
Continued from page 1

Sensor Address	Description	I/O Range	Comments	Default	Access
40603	Address	1-254	-	1	RW
40605	Restore Factory Configuration	0 = No Operation, 1 = Restore	-	-	WO

Device Information

Sensor Address	Description	I/O Range	Comments	Default	Access
40606-40615	Banner Name	0..65535	-	Banner Engineering	RO
40616-40631	Product Name	0..65535	-	S15S-TH-MQ	RO
40632	Item H	0..65535	812242 split into two registers	12	RO
40633	Item L	0..65535		27164	RO
40634	Serial Number 1 (H)	0..65535	-	-	RO
40635	Serial Number 2	0..65535	-	-	RO
40636	Serial Number 3	0..65535	-	-	RO
40637	Serial Number 4 (L)	0..65535	-	-	RO
40644-40659	User Define Tag	0..65535	User writable space	More Sensors. More Solutions.	RW

Wiring Diagrams

4-Pin Male M12 Quick Disconnect Connector	Pin	Wire Color	Sensor Connection
	1	Brown	10 V DC to 30 V DC
	2	White	RS485/D1/B/+
	3	Blue	Ground (-)
	4	Black	RS485/D0/A/-

Status Indicators

Power LED Indicator (Green)

- Solid Green = Power On
- Off = Power Off

Modbus Communication LED Indicator (Amber LED 1)

- Flashing Amber= Modbus communications are active
- Off = Modbus communications are not present

Sensor Measurement LED Indicator (Amber LED 2)

- Flashes every five seconds

Specifications

Supply Voltage

10 V DC to 30 V DC at 50 mA maximum

Supply Current

Active Comms at 30 V DC: 4.5 mA

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Leakage Current Immunity

400 µA

Resolution

12-bits

Indicators

Green LED: Power

Amber LED 1 (Flashing): Modbus communications active

Amber LED 2 (Flashing Every 5 Seconds): Sensor measurement LED indicator

Connections

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

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)

Environmental Rating at M12 Connection

IP65, IP67, IP68

UL Type 1

Temperature and/or Humidity Input

Sample Rate: 3 seconds

Humidity

Measuring Range: 0 to 100% relative humidity (RH)

Resolution: 0.1% RH

Accuracy:

± 2% at 25 °C
± 3% at 0 °C to +70 °C (+32 °F to +158 °F) and 10% to 90% RH
± 7% at 0 °C to +70 °C (+32 °F to +158 °F), and 0% to 10% or 90% to 100% RH

Temperature

Measuring Range: –40 °C to +85 °C (–40 °F to +185 °F)

Resolution: 0.1 °C (32.18 °F)

Accuracy:

-40 °C to 0 °C (-40 °F to +32 °F): ± 0.8 °C (± 1.5 °F)
0 °C to +60 °C (+32 °F to +140 °F): ± 0.7 °C (± 1 °F)
+60 °C to +85 °C (+140 °F to +185 °F): ± 1.3 °C (± 2.2 °F)

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 (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

Product Identification

SNAP SIGNAL®

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.

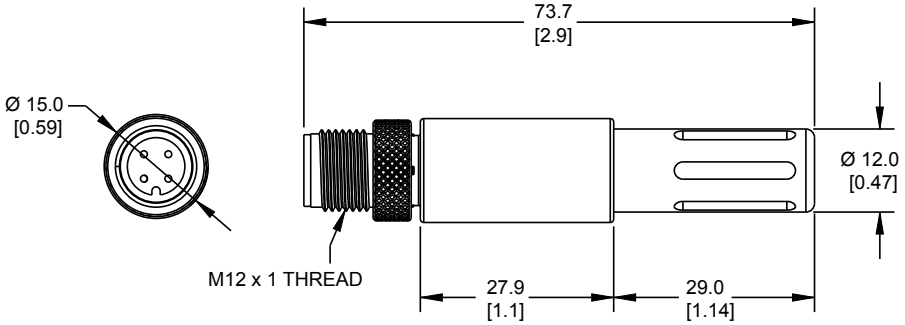
Industry Canada ICES-003(B)

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.

Dimensions

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



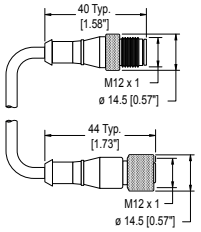
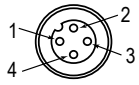
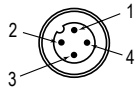
S15S Accessories

Temperature-Humidity Filter Caps

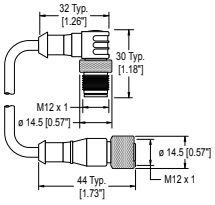
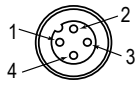
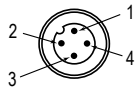
FTH-FIL-001 • Aluminum grill filter cap • Factory default, ships with the M12FT*Q and Q45 All-in-One sensors		**FTH-FIL-002** • Stainless steel • Sintered to 40-micrometer porosity (for high dust environments.)	

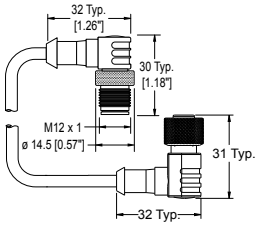
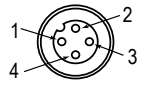
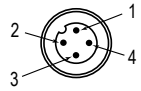
Cordsets

4-pin M12 Cordsets - Female to Male Double-Ended, Straight

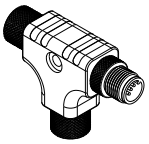
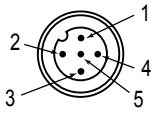
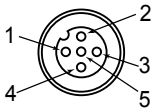
Model	Length	Dimensions (mm)	Pinouts	
BC-M12F4-M12M4-22-1	1 m (3.28 ft)		Female  Male 	1 = Brown 2 = White 3 = Blue 4 = Black
BC-M12F4-M12M4-22-2	2 m (6.56 ft)			
BC-M12F4-M12M4-22-5	5 m (16.4 ft)			
BC-M12F4-M12M4-22-8	8 m (26.25 ft)			
BC-M12F4-M12M4-22-10	10 m (30.81 ft)			
BC-M12F4-M12M4-22-15	15 m (49.2 ft)			

4-pin M12 Cordsets - Female Straight to Male Right-Angle Double-Ended

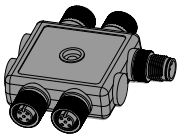
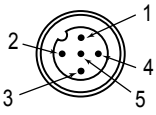
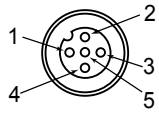
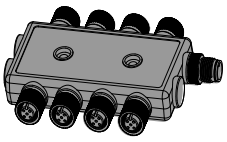
Model	Length	Dimensions (mm)	Pinouts	
BC-M12F4-M12M4A-22-1	1 m (3.28 ft)		Female  Male 	1 = Brown 2 = White 3 = Blue 4 = Black
BC-M12F4-M12M4A-22-2	2 m (6.56 ft)			
BC-M12F4-M12M4A-22-5	5 m (16.4 ft)			
BC-M12F4-M12M4A-22-8	8 m (26.25 ft)			
BC-M12F4-M12M4A-22-10	10 m (30.81 ft)			
BC-M12F4-M12M4A-22-15	15 m (49.2 ft)			

4-pin M12 Cordsets - Female Right-Angle to Male Right-Angle Double-Ended				
Model	**Length**	**Dimensions (mm)**	**Pinouts**	
BC-M12F4A-M12M4A-22-1	1 m (3.28 ft)		Female  Male 	1 = Brown 2 = White 3 = Blue 4 = Black
BC-M12F4A-M12M4A-22-2	2 m (6.56 ft)			
BC-M12F4A-M12M4A-22-5	5 m (16.4 ft)			
BC-M12F4A-M12M4A-22-8	8 m (26.25 ft)			
BC-M12F4A-M12M4A-22-10	10 m (30.81 ft)			
BC-M12F4A-M12M4A-22-15	15 m (49.2 ft)			

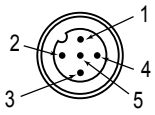
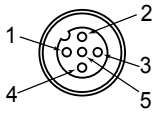
Splitter Tee

5-Pin Threaded M12 Splitter Tee			
Model		**Pinout (Male)**	**Pinout (Female)**
CSB-M1250M1250-T • Two 5-pin M12 female quick-disconnect connectors • One 5-pin M12 male quick-disconnect connector • Parallel wiring		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray	 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray

5-Pin Molded Junction Blocks

Model		Pinout (Male)	Pinout (Female)
R50-4M125-M125Q-P Molded Junction Block • Four integral 5-pin M12 female quick-disconnect connectors • One integral 5-pin M12 male quick-disconnect connector • Parallel wiring • Product documentation (p/n 227974)		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray	 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray
R95-8M125-M125Q-P Molded Junction Block • Eight integral 5-pin M12 female quick-disconnect connectors • One integral 5-pin M12 male quick-disconnect connector • Parallel wiring • Product documentation (p/n 227974)			

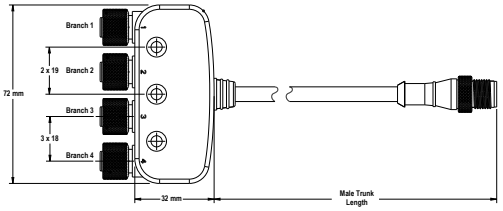
Splitter Cordsets

5-Pin Threaded M12 Splitter Cordset with Flat Junction—Double Ended			
Model	**Description**	**Pinout (Male)**	**Pinout (Female)**
CSB4-M1251M1250	Four (no cable) 5-pin M12 female quick-disconnect connectors One 0.3 m (0.98 ft) cable with a 5-pin M12 male quick-disconnect connector Parallel wiring		

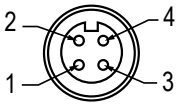
Continued on page 6

Continued from page 5

5-Pin Threaded M12 Splitter Cordset with Flat Junction—Double Ended

Model	Description	Pinout (Male)	Pinout (Female)
		1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray	1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray

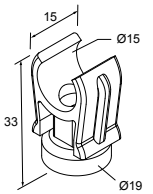
4-Pin Threaded M12 RS-485 to USB Adapter Cordset, with Wall Plug

Model	Length	Style	Dimensions	Pinout (Female)
BWA-UCT-900	1 m (3.28 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black

Bracket

LMBS15MAG

- Attaches to S15 housing
- White polypropylene
- 11.8 kg (26 lb) pull force
- One piece



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.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: www.bannerengineering.com.

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

Document title: S15S Temperature and Humidity Sensor
Part number: 224483
Revision: C
Original Instructions

224483