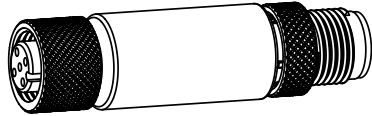


S15C Analog to Pulsed I/O Converter

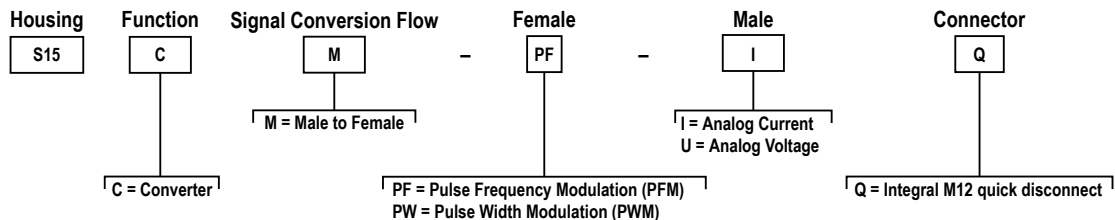


Datasheet



- Compact converter that connects to a current source (4 mA to 20 mA) or a voltage source (0 V DC to 10 V DC), and outputs the value as a pulsed signal, either PFM or PWM
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a Pulse Pro enabled indicator or anywhere in-line for ease of use

Models



Pulsed I/O

Pulse Frequency Modulation (PFM) is a digital way to represent an analog value by varying the frequency of a pulse train. It is measured in Hertz (Hz).

Pulse Width Modulation (PWM) is a digital way to represent an analog value by varying the width of pulses at a constant frequency. The duty cycle (on-time versus off-time) is measured in percent from 0-100.

Wiring Diagrams

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

Male (Analog Input)	Signal Description	Female (Pulse Output)	Signal Description
Pin 1	12 V DC to 30 V DC	Pin 1	12 V DC to 30 V DC
Pin 2	Analog Input (4 mA to 20 mA, or 0 V to 10 V)	Pin 2	Pulse Frequency Modulated (PFM) Output*
Pin 3	Ground	Pin 3	Ground
Pin 4	Analog Reference	Pin 4	Pulse Width Modulated (PWM) Output*

*Only one output per device based on model

Status Indicators

Power LED Indicator (Green)

- Solid = Power On
- Off = Power Off

Pulsed I/O LED Indicator (Amber)

- Solid = Pulsed output is in range and active
- Flashing = Pulsed output is at limits
- Off = Pulsed output is inactive

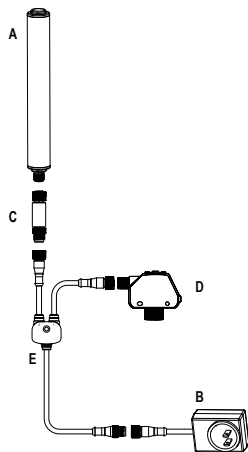
Analog Input LED Indicator (Amber)

- Solid = Analog value is within valid range (4 mA to 20 mA, or 0 V to 10 V)
- Flashing = Output is at limits or out of range

Default Value Table		
Analog	PFM	PWM
0 V	100 Hz	0%
10 V	600 Hz	100%
4 mA	100 Hz	0%
20 mA	600 Hz	100%



Connecting a Pro Light to a Sensor or PLC



- A = WLS27 Pro, WLS15 Pro, or TL50 Pro with Pro Editor
- B = Power Supply (PSW-24-1 or PSD-24-4)
- C = S15C Pulse Pro Converter; for model selection, see [Table 1](#) below
- D = Sensor or PLC with 0-10 V or 4-20 mA analog output; for model selection, see [Table 1](#) below
- E = Splitter to connect sensor and light (CSB-M1241M1241)

Table 1: Model Selection

Output: Pulse Pro (Female)	Input: Analog (Male)	
	4-20 mA	0-10 V
PFM	S15CM-PF-IQ	S15CM-PF-UQ
PWM	S15CM-PW-IQ	S15CM-PW-UQ



Note: For installation flexibility, see double-ended cordset options in [Accessories](#) on page 3.

Specifications

Supply Voltage

12 V DC to 30 V DC at 50 mA maximum exclusive of load
 PWM/PFM output: 50 mA maximum

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Sampling Rate

20 Hz

Indicators

Green power
 Amber pulse output present
 Amber analog value present

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



Advanced Capabilities



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



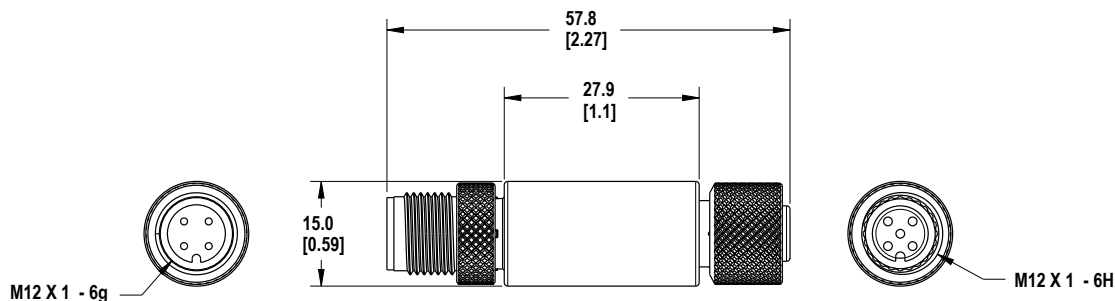
WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

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)			Male
MQDEC-430SS	9.14 m (30.2 ft)			<p>1 = Brown 2 = White 3 = Blue 4 = Black</p>

5-Pin Threaded M12 Shielded Twisted Pair Cordsets—Double Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDEC-STP-501SS-FF	0.31 m (1 ft)	Female Straight/ Female Straight		<p>1 = Brown 2 = White 3 = Blue 4 = Black 5 = Shield</p>

4-Pin Threaded M12 Splitter Cordsets—Flat Junction				
Model	Branches (Female)	Trunk (Male)	Pinout	
CSB-M1240M1240	No branch	No trunk	<p>Male</p> <p>1 = Brown 2 = White 3 = Blue 4 = Black</p>	
CSB-M1240M1241	2 × 0.3 m (1 ft)	No trunk		
CSB-M1241M1241		0.30 m (1 ft)		
CSB-M1248M1241		2.44 m (8 ft)		
CSB-M12415M1241		4.57 m (15 ft)		
CSB-M12425M1241		7.60 m (25 ft)		
CSB-UNT425M1241		7.60 m (25.0 ft) Unterminated		

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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.

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FCC Part 15

This device complies with Part 15 of the FCC Rules. 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.