

IIoT Made Easy





Monitor Your Factory Data in a Snap

Customers use Banner's Snap Signal hardware and software to instantly unlock valuable data from their equipment and increase productivity. This **SCADA Banner** smart-factory portfolio forms an overlay network by CDS HMI/PLC Consume capturing signals from existing and new devices, converting them to a unified protocol, and then **Industrial Ethernet** distributing them to monitoring platforms, such as SCADA systems, the cloud, or a local PLC/HMI Modbus **PROFO**® Edge for consumption. The solution deploys easily by Distribute Device NET EtherNet/IP leveraging available information without disrupting your existing controls. This helps save you money, reduces downtime, and optimizes **IO-Link Master** your operations. Network Wire Replacement IO-Link Hub Analog Analog Convert to IO-Link to Modbus Converter Converter Connect Capture Capture **Distribute** Connect Convert **Network** Consume

SNAP SIGNAL CAPTURE

Capture Actionable Data

The devices that outfit automated production lines—sensors, tower lights, motor drives, valves, and other components—transmit electronic signals as part of their basic functionality. For example, whenever a sensor detects an item moving along a conveyor, or activates an indication light, or identifies that a motor is running hot, there is a pulse of activity. By adding a system to monitor these signals, you can unlock a wealth of valuable information.

By monitoring a single sensor, you begin to understand cycle time, throughput, and uptime. If you had multiple machines with identical sensing points, you could monitor each one and compare their performance. Or this data could be used for improving efficiencies, reducing downtime, and lowering costs. It could even be used for predictive equipment maintenance.

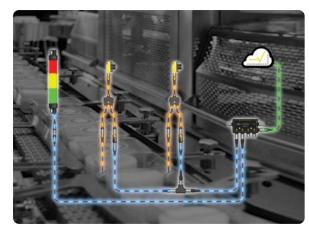
It all starts with capturing the data that will be beneficial to your operation. Snap Signal is designed to be brand agnostic, modular, and scalable, so you can capture data from your existing devices (or add new ones), visualize that information, and make insight-driven decisions.





Maximize Throughput and Reduce Downtime by Harnessing Sensor Data from Your Equipment

- Monitor production throughput and performance using existing sensors and Snap Signal converters
- Calculate OEE metrics, such as availability, performance, and quality, locally on the DXMR90 industrial controller
- Send actionable data to the cloud directly from the DXMR90



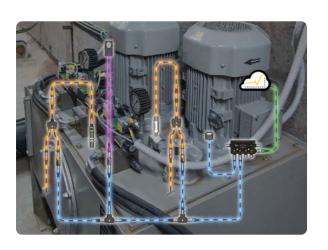


Provide Real-Time Tank Level Monitoring Data to Efficiently Manage Inventory

- Connect existing ultrasonic or radar tank-level sensors
- Monitor tank volume and make decisions at the sensor level with the DXMR90
- Send actionable tank-level data and alerts to Banner's Cloud Data Services (CDS)

Keep Hydraulic Power Units Running at Peak Performance

- Add Snap Signal converters to sensors measuring any machine condition, such as pressure, current, oil temperature, and vibration
- Send data from hydraulic machinery to the DXMR90 for real-time condition monitoring
- Set alerts locally or in the cloud to respond to potential failures quickly







SNAP SIGNAL CAPTURE



QM30VT2 Vibration and Temperature Sensor

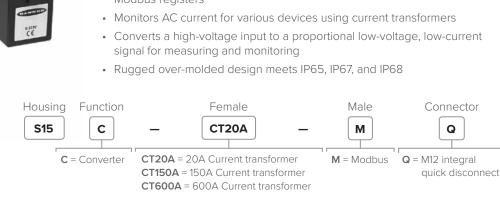
- Detects dual-axis vibration up to 4 kHz bandwidth
- Provides high accuracy vibration and temperature measurements
- Industrial grade sensor with small form factor to fit in the tightest locations
- Connects to any Modbus network for easy set up and installation

I/O	Housing	Connection	Models
	Aluminum	2.09 m 5-pin M12 male QD	QM30VT2
Vibration and		150 mm 5-pin M12 male QD	QM30VT2-QP
temperature via RS-485 Modbus	316L	150 mm 5-pin M12 male QD	QM30VT2-SS-QP
NO 100 Modbas	Stainless Steel	9.1 m flying leads	QM30VT2-SS-9M



S15C In-Line Converter with Current Transformer

 Connects to the included current transformer and outputs the value to Modbus registers





Rogowski Coil Current Sensor

- Monitors AC current of motors, panels, and facilities
- Pre-scaled and pre-configured sensor with a Modbus output
- Sensing loop can be opened, allowing for simple installation

AC Current Range (A)	Coil Diameter (mm)	Models
500	FO	S15S-R500-MQ
1000	50	S15S-R1000-MQ
3000	200	S15S-R3000-MQ
6000	200	S15S-R6000-MQ



AC Voltage Sensor

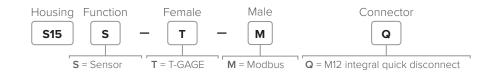
- Pre-configured and pre-scaled to help users accelerate the commissioning process and eliminate scaling errors
- Sensor data is easily accessed via the Modbus RTU interface
- Includes plug-and-play functionality within the Snap Signal ecosystem
- Provides a comprehensive view of equipment and overall machine health and improves the accuracy of power consumption calculations when used with the SNAP ID-enabled Asset Monitoring Gateway

Input Output		Connection	Models	
Voltage transformer	Modbus	M12 integral quick disconnect	S15C-UT460-MQ-1	



S15S Infrared Non-Contact Temperature Sensor

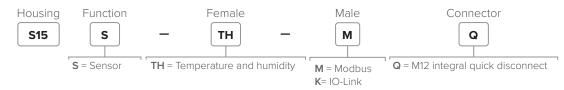
- Non-contact infrared temperature sensor outputs temperature to Modbus registers
- By detecting emitted infrared energy, the S15S Non-Contact Infrared Temperature Sensor quickly and reliably checks temperatures without needing to be touching the target
- Rugged overmolded design





S15S Temperature and Humidity Sensor

- Monitors temperature, humidity, and dew point in one device
- Ships with aluminum grill filter cap
- Optional stainless steel 10 μm sintered filter available separately
- Connects to any Modbus or IO-Link network for easy setup and communication
- IO-Link model available with discrete output for high or low temperature, humidity and dew point thresholds and communication

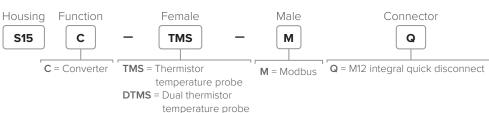


SNAP SIGNAL CAPTURE



S15C In-Line Converter with Thermistor(s)

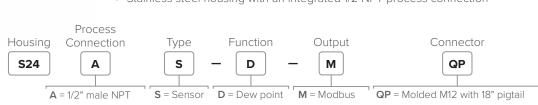
- Compact converter that connects to a a single or dual thermistor probe (model dependent) and outputs the value to Modbus registers
- Thermistors are used as temperature sensors and are an accurate and costeffective sensor for measuring temperatures in various applications
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use





S24 Dew Point Sensor

- Monitors dew point, humidity, and temperature in a compressed air system
- · Provides serial data output for use in a control system
- Can be installed in the main distribution line or downstream line
- Stainless steel housing with an integrated 1/2 NPT process connection





S15C Pressure Sensor

- Includes PGP Pressure Sensor and S15C Analog to Modbus Converter
- Sensor pre-configured for use with converter to eliminate errors and speed commissioning
- Accurately brings fluid or gas pressure measurements into a Snap Signal system

Input	Output	Measurement Range	Connection	Models
		0-15 PSI	4-pin M12 male quick disconnect, 1/4 inch NPT fitting	S15C-PS15SS-MQ
		0-50 PSI		S15C-PS50SS-MQ
		0-100 PSI		S15C-PS100SS-MQ
Pressure sensor	Modbus	0-150 PSI*		S15C-PS150C-MQ
3611301		0-150 PSI		S15C-PS150SS-MQ
		0-3000 PSI		S15C-PS3000SS-MQ
		0-5000 PSI		S15C-PS5000SS-MQ

*Ceramic element intended for gas media only



K50 Ultrasonic Sensor

- Functions as a Modbus slave device via RS-485
- Can be connected via a wireless or wired Modbus network
- One meter or three meter sensing range

Input	Output	Range	Frequency	Connection	Models
Ultrasonic		300 mm to 3 m	114 kHz	230 mm integral	K50UX2CRA
level	Modbus	100 mm to 1 m	224 kHz	5-pin M12 male quick disconnect	K50UX2ARA



QM42 Differential Pressure Sensor

- Offers accurate low-differential pressure measurement of air and noncondensing, non-corrosive gases
- Silicon piezoresistive differential pressure core
- Aluminum alloy housing
- Sensing range from ±1 up to ± 20 inches of water column depending on the model
- RS-485 Modbus serial communication

Input	Output	Measurement Range	Connection	Models
Pressure	Modbus	±1 inches water column	2.09 m 5-pin	QM42-DPS1-2Q
		±5 inches water column	M12 pigtail quick	QM42-DPS5-2Q
		±20 inches water column	disconnect	QM42-DPS20-2Q

Accessories



BWA-QM30-CMAL

Curved surface magnet mount



BWA-QM30-FMSS

Flat surface magnet mount



BWA-QM30-FSALR

Flat surface screw mount with rapid release set screw



SMB-S15S-SWIVEL

Stainless steel mounting flange with m5 screw holes



SMB-S15S-SWIVEL-MAG

Stainless steel mounting flange with m5 screw holes with mounting magnets included



BWA-BK-004

Mounts both the K50U Ultrasonic sensor and a Wireless Q45U Node or DX80 Node



BWA-BK-006

Mounts a K50U Sensor and Wireless Q45U Node



BWA-BK-001

Magnetic bracket with screws







Connect Your Devices

Snap Signal products are designed to be part of a plug-and-play solution. Snap Signal incorporates M12 connectors, which are the industry standard for joining devices together. This makes it possible to deliver the benefits of Snap Signal as an "overlay network," which consists of using splitter cables to connect to existing devices.

This overlay network is unique. Nothing is disabled from, or interferes with, the existing control system; instead, the attached monitoring connections simply "listen in" to the signals. The overlay network also speeds up the process of monitoring devices on your machine, because it connects quickly and does not require previous cable runs to be rerouted. Any device that does not already have an M12 connector can be easily converted using field-wirable M12 connectors.

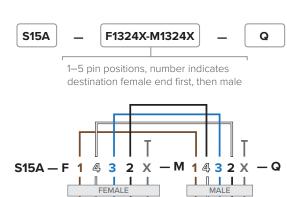




S15A Wiring Adapter

- Adapters reroute wiring to match specific application requirements
- Match outputs to inputs and isolate select signals
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- Simple M12 and M8 connection for easy installation where needed in the circuit
- Custom options are available

Function Description	Model
Pin 2 goes to Pin 4 in both directions	S15A-F14325-M14325-Q
Female Pin 4 goes to Male Pin 5	S15A-F1235X-M123X4-Q
Female Pin 2 goes to Male Pin 5	S15A-F1534X-M1X342-Q
Pin 1 is open; all others pass through	S15A-FX2345-MX2345-Q
Pin 2 is open; all others pass through	S15A-F1X345-M1X345-Q
M12 Female 4-pin to M8 Male 3-pin	S15A-M12F4M8M3
M12 Male 4-pin to M8 Female 3-pin	S15A-M12M4M8F3
M12 Female 4-pin to M8 Male 4-pin	S15A-M12F4M8M4
M12 Male 4-pin to M8 Female 4-pin	S15A-M12M4M8F4

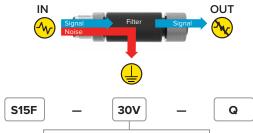




S15F In-Line Filter

- Protect devices from electrical noise and transients
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- Simple M12 connection for easy installation where needed in the circuit
- Improve signal integrity and reduce troubleshooting time, and install wiring more quickly

Function Description	Model
Filter; High impedance, rated to 500mA	S15F-H-500-Q
Filter; Low impedance, rated to 4000mA	S15F-L-4000-Q
Suppressor; Rated to 30 V DC	S15F-30V-Q



30V = 30 V DC voltage suppressor **H-500** = Hi-impedence filter 500 mA max

L-4000 = Low-impedence filter 4000 mA max



S15J In-Line Fuse

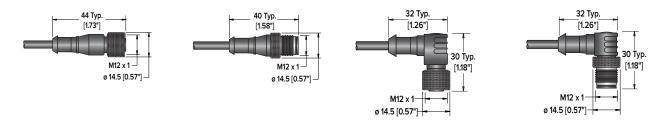
- Protect devices from over-current
- Rugged over-molded design meets IP65, IP67, and IP68
- Simple M12 connection for easy installation where needed in the circuit
- LEDs provide fuse status to indicate healthy or blown status

Function Description	Model
Fast-blow fuse, 2 A max	S15J-2AFB-Q
Fast-blow fuse, 3 A max	S15J-3AFB-Q



Cable: PVC jacket, PUR (polyurethane) connector body, nickel-plated brass coupling nut Conductors: 22 AWG or 24 AWG (open shield only) high-flex stranded, gold-plated contacts

Temperature: -40° to +90° C





4-Pin M12 Cordsets (Voltage: 250 V DC/AC, Current: 4 A)

		Length	Straight	Right-Angle	Pin	out	
	2 4-Pin Female QD to Flying Leads 8	1 m	BC-M12F4-22-1	BC-M12F4A-22-1			
		2 m	BC-M12F4-22-2	BC-M12F4A-22-2	Female 1-(60)-2 4-3	1 = Brown 2 = White 3 = Blue 4 = Black	
1		5 m	BC-M12F4-22-5	BC-M12F4A-22-5			
		8 m	BC-M12F4-22-8	BC-M12F4A-22-8			
		10 m	BC-M12F4-22-10	BC-M12F4A-22-10			
		15 m	BC-M12F4-22-15	BC-M12F4A-22-15	22 AWG	Cable ø – 5.2 mm	
		1 m	BC-M12M4-22-1	-			
1		2 m	BC-M12M4-22-2	_	Male 2 3 1		
1	4-Pin Male QD to Flying Leads	5 m	BC-M12M4-22-5	-		1 = Brown 2 = White 3 = Blue	
		8 m	BC-M12M4-22-8	_		4 = Black	
		10 m	BC-M12M4-22-10	-	22 AWG	Cable ø – 5.2 mm	

^{*}Not all models are shown. Please contact Banner for other available lengths and double-ended styles.



4-Pin M12 Cordsets (Voltage: 250 V DC/AC, Current: 4 A)

	Length	Straight/Straight (female/male)	Straight/Right-Angle (female/male)	Pi	nout
	0.3 m	BC-M12F4-M12M4-22-0.3	BC-M12F4-M12M4A-22-0.3		
	0.5 m	BC-M12F4-M12M4-22-0.5	_		1 = Brown 2 = White 3 = Blue 4 = Black
	1 m	BC-M12F4-M12M4-22-1	BC-M12F4-M12M4A-22-1	Female 1 00 2 4 00 3 Male 3 1 4	
	2 m	BC-M12F4-M12M4-22-2	BC-M12F4-M12M4A-22-2		
4-Pin	3 m	BC-M12F4-M12M4-22-3	-		
Double-Ended	4 m	BC-M12F4-M12M4-22-4	_		
	5 m	BC-M12F4-M12M4-22-5	BC-M12F4-M12M4A-22-5		
	6 m	BC-M12F4-M12M4-22-6	_		
	10 m	BC-M12F4-M12M4-22-10	BC-M12F4-M12M4A-22-10		
	15 m	BC-M12F4-M12M4-22-15	BC-M12F4-M12M4A-22-15		Cable ø – 5.2 mm

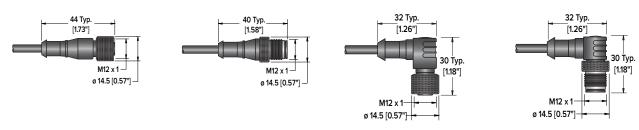
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Cable: PVC jacket, PUR (polyurethane) connector body, nickel-plated brass coupling nut

Conductors: 22 AWG or 24 AWG (open shield only) high-flex stranded, gold-plated contacts

Temperature: -40° to $+90^{\circ}$ C





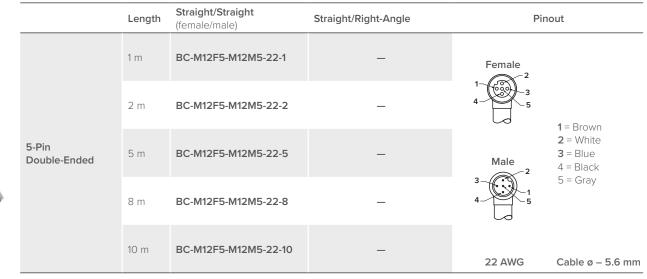
5-Pin M12 Cordsets (Voltage: 60 V DC/AC, Current: 4 A)

		Length	Straight	Right-Angle	Pin	out	
	5-Pin Female QD to Flying Leads	1 m	BC-M12F5-22-1	BC-M12F5A-22-1	Female 1		
		2 m	BC-M12F5-22-2	BC-M12F5A-22-2		1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray	
1		5 m	BC-M12F5-22-5	BC-M12F5A-22-5			
		8 m	BC-M12F5-22-8	BC-M12F5A-22-8			
		10 m	BC-M12F5-22-10	BC-M12F5A-22-10			
		15 m	BC-M12F5-22-15	_	22 AWG	Cable ø – 5.6 mm	
	5-Pin Male QD to Flying Leads	1 m	BC-M12M5-22-1	-			
•		2 m	BC-M12M5-22-2	_	Male 3 - 2 - 1 - 5	1 = Brown 2 = White 3 = Blue 4 = Black	
		5 m	BC-M12M5-22-5	-			
		8 m	BC-M12M5-22-8	_		5 = Gray	
		10 m	BC-M12M5-22-10	_	22 AWG	Cable ø – 5.6 mm	

^{*}Not all models are shown. Please contact Banner for other available lengths and double-ended styles.



5-Pin M12 Cordsets (Voltage: 60 V DC/AC, Current: 4 A)



^{*}Not all models are shown. Please contact Banner for other available lengths and double-ended styles.



4-Pin M12 Coiled Cordsets

		Length	Straight	Pin	out
		0.8 to 1.7 m	MQDC-401.7M-PUR-C		
	4-Pin Coiled Cordsets	1.0 to 2.6 m	MQDC-402.6M-PUR-C	Female	1 = Brown 2 = White 3 = Blue 4 = Black
		1.2 to 3.3 m	MQDC-403.3M-PUR-C	22 AWG	Cable ø – 5.2 mm
	4-Pin Coiled	0.8 to 1.7 m	MQDEC-401.7M-PUR-C	Female 1	
	Double-Ended Cordsets	1.0 to 2.6 m	MQDEC-403.3M-PUR-C	Male 3 2 4 22 AWG	3 = Blue 4 = Black Cable ø – 5.2 mm



M12 Splitters and Tees

	Models	Cabl	e Lengths	Wising	Diagrams
	Wiodels	Branches (Female)	Trunk (Male)	wining	Diagrams
	CSB-M1240M1240	No Branch	No Trunk		
	CSB-M1240M1241	2 x 0.3 m	No Trunk		Branch 1
	CSB-M1241M1241	2 x 0.3 m	0.3 m		(female)
4-Pin	CSB-M1243M1243	2 x 1 m	1 m	Trunk (male) 1 2 3 4 22 AWG Cable 6	3 4
4-2111	CSB-M1243M1246	2 x 2 m	1 m		1 2 3
	CSB-M1248M1241	2 x 0.3 m	2.4 m		Branch 2 (female)
	CSB-M12415M1241	2 x 0.3 m	4.6 m		
	CSB-UNT425M1241	2 x 0.3 m	7.6 m Unterminated		Cable ø – 6.0 mm

	Models	Cable	e Lengths	Wiring Diagrams
	ivioueis	Branches (Female)	Trunk (Male)	Willing Diagrams
	S15YB-M124-M124-0.2M			Trunk (male) 4 1 2 3 4 4 Branch 2 (female)
4-Pin	1-Pin S15YA4-M124-M124-0.2M 2 x 0.2 m No Trunk	No Trunk	Branch 1 (female) 1	
			Branch 1 (female) 1 1 1 1 2 3 4 NIC 4 Branch 2 (female)	

M12 Splitters and Tees

		Models	Cable	Lengths	Wiring Diagrams
		ivioueis	Branches	Trunk	(applies to all branches)
		CSB-M1251FM1251M	2 x 0.3 m (Male)	0.3 m (Female)	Trunk (male) NC 2 3 4 NC 2 3 4 Branch 1 (female) NC 2 3 4 Branch 2 (female)
	5-Pin	CSB4-M1251M1250	4 x No Branch (Female)	0.3 m (Male)	Trunk (male)
	5.Pin	CSB-M1250M1250-T	No Branch	No Trunk	Branch (female) 1 2 3 3 4 4 (male)
8	5-Pin	CSB-M1250M1250-A	No Branch	No Trunk	1 2 2 3 3 4 4 5 5 Branch (female)



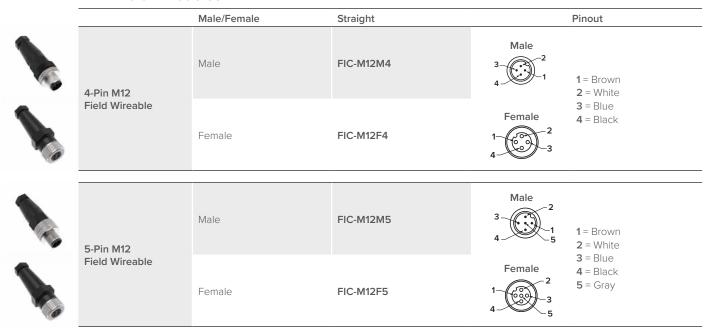
M12 Molded Junction Blocks

	Models	Cable	e Lengths	Wiring Diagram	
	Wiodels	Branches (Female)	Trunk (Male)	(applies to all branches)	
	R50-4M125-M125Q-P	4 x No Branch	No Trunk	Branci (female	
5-Pin	R95-8M125-M125Q-P 8 x No E	8 x No Branch	No Trunk	1 2 2 2 3 4 4 5 5 Branch (female	

Molded I/O Junction Blocks

	Medala	Cable Lengths		Wiring Diagram
Models		Branches (Female)	Trunk	Wiring Diagram
	R95-8M125-C1-D24P		1 m with Flying Leads	
5-Pin	R95-8M125-0.3M23-D24P	8 x No Branch/ Integral QD	0.3 m 19-pin M23 Male QD	
31111	R95-8M125-C1-D24		1 m with Flying Leads	2
	R95-8M125-0.3M23-D24		0.3 m 19-pin M23 Male QD	

M12 Field Wireables



Ethernet Cordsets

	Length	Straight		Pinout
	2 m	STP-M12D-406		
4-Pin Male M12 to RJ45	5 m	STP-M12D-415	Male 1 = Brown 2 = White 3 = Blue 4 = Black 2 x 24 Pair AWG Cable Ø – 6.2 m	2 = White 3 = Blue
	9 m	STP-M12D-430		

Accessories _



Attaches to
M12 cordset end
(magnetic)



BWA-M12CAB-MAG Attaches to M12 cable (magnetic)



LMBM12SP
Attaches to

M12 cordset end



ACC-CAP M12-10

Protective

end cap



LMBS15MAG Attaches to S15C (magnetic)



LMBS15SP Attaches to S15C

SNAP SIGNAL CONVERT

Convert to a Unified Protocol

After the physical connections are made to the devices on your machine or automation system, we need to get everything speaking the same language. Some devices might send discrete PNP or NPN signals, others might use analog 0–10 V DC signals, and you might plan to add other types of devices in the future, such as current transducers. All of these signals need to be quickly and easily converted to a unified protocol. This enables you to build a serial network.

Most Snap Signal converters are only the size of a single AA battery, and they begin converting signals as soon as they are installed.





S15C Converter

Break free from protocol limitations with S15C in-line converters. S15C converters take various types of signals such as discrete, analog, and others and convert these signals to smart protocols like IO-Link or Modbus. This makes it easy to incorporate existing legacy sensors into standard protocols to enable process monitoring. They are designed to connect directly to a sensor, indicator, or other device and begin operating immediately, fitting seamlessly into your factory applications.

- Allows previously incompatible devices to be connected to a smart system
- Compact form factor
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- Simple M12 connection for easy installation wherever needed in the circuit

S15C Converter

IO-Link®

Easily converts signals like 4-20 mA analog to IO-Link without any setup required





KQ

I = 4-20 mA**U** = 0-10 V DC

B21 = Discrete Input/Output

MGN = Modbus

MGP = Modbus GPS MVT= Modbus V/T Sensor

MEZ = EZ-ARRAY

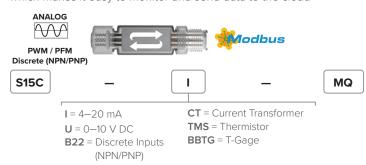
MTH = Modbus T/H Sensor

MUL = Modbus Ultrasonic Sensor

S15C Converter

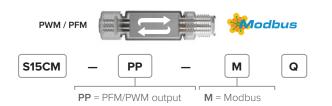


Easily converts signals like discrete, analog, and more to Modbus, which makes it easy to monitor and send data to the cloud



S15CM Converter

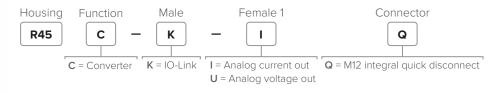
Compact converter that connects to a Modbus® device and outputs the value as a pulsed signal, either PFM or PWM





R45C IO-Link to Analog Out Converter

- Compact analog to IO-Link device converter that outputs an analog value, voltage, or current, as presented by the IO-Link master
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use



SNAP SIGNAL CONVERT



R45C IO-Link to Dual Analog Input-Output Converter

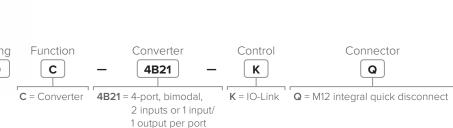
- Compact IO-Link device to analog converter that outputs an analog value, voltage, or current, as presented by the IO-Link master
- The converter also connects to an analog source, voltage, or current, and outputs the value to the IO-Link master and as a representative PFM output
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use





R90C Discrete IO-Link Hub

- Connect two discrete signals to each of the unique ports, providing access to monitoring and configuring those ports with an IO-Link master
- Host mirroring is available where a selected port input/output discrete signal can be routed to Pin 2 (male) on the PLC/Host connection





R130C Discrete IO-Link Hub

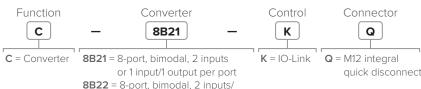
- Cost-efficiently integrate up to 16 devices into an IO-Link system
- Simplify wiring and installation with M12 QD cables
- Minimize the size of the control panel by locating I/O remotely on the machine, closer to sensors and other devices
- Provide power to lighting products and other devices that draw higher current with 4 amps shared across ports
- Streamline troubleshooting with I/O status LEDs viewable from top or side of device





R95C Discrete IO-Link Hub

- Connect two discrete signals to each of the unique ports, providing access to monitoring and configuring those ports with an IO-Link master
- Host mirroring is available where a selected port input/output discrete signal can be routed to Pin 2 (male) on the PLC/Host connection





R95C Discrete and Analog Input-Output IO-Link Hub

outputs per port

- Compact IO-Link device converter with the ability to send 4 ports of discrete input and 4 ports of analog input data (voltage or current) to an IO-Link Master
- The IO-Link Master Process Data Output can also output discrete values and analog outputs (voltage or current) through any of the respective sets of 4 ports
- Rugged overmolded design meets IP65, IP67, and IP68





R95C Analog Input IO-Link Hub

- Compact analog IO-Link hub that connects to a current or voltage analog source and outputs the value to an IO-Link master
- Ability to represent one of the eight analog inputs as a PFM output
- R95C IO-Link hubs are a quick, easy, and economical way to integrate non-IO-Link devices into an IO-Link system
- Rugged over-molded design meets IP65, IP67, and IP68



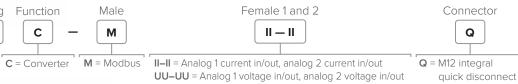
C = Converter 8UI = 8-port, voltage/current K = IO-Link Q = M12 integral quick disconnect analog input

SNAP SIGNAL CONVERT



R45C Modbus to Dual Analog Input-Output Converter

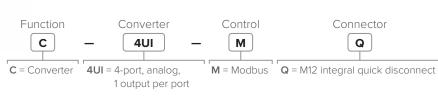
- Compact Modbus to analog converter that can output an analog value, voltage, or current as presented to the appropriate Modbus register
- The converter can also connect to an analog source, voltage, or current, and outputs the value to defined Modbus register
- Rugged over-molded design meets IP65, IP67, and IP68
- Port mirroring feature also enables operators to capture existing analog sensor data without disrupting communications with a PLC





R90C Modbus to Analog Output Hub

- Compact Modbus to analog converter that generates a current or voltage output on each of the four ports
- R90C Modbus hubs are a quick, easy, and economical way to integrate analog outputs into a Modbus system
- Rugged over-molded design meets IP65, IP67, and IP68





IC70 In-Cabinet IO-Link Hub

- · Save space with a compact, DIN-rail mountable design
- Increase system flexibility with configurable input/output channels
- Reduce wiring and PLC logic with built-in delays and port mirroring
- Speed up troubleshooting with real-time status LEDs

Description	Connections	Model
16-Channel PNP IO-Link Hub	Screw terminals	IC70-16P-K



R95C Discrete Bimodal to Modbus Hub

The R95C Discrete Bimodal to Modbus Hub connects two discrete channels to each of the eight unique ports, providing access to monitoring and configuring those ports via Modbus registers. Host mirroring is available where a selected port input/output discrete signal can be routed to Pin 5 (male) on the PLC/Host connection.



Connector Q M = Modbus Q = M12 integral

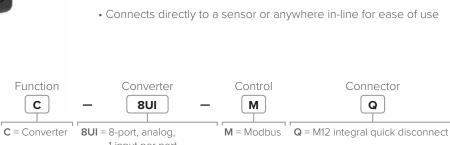
or 1 input/1 output per port

quick disconnect



R95C Analog In to Modbus Hub

- Compact analog to Modbus device converter that connects up to eight analog sources (either current or voltage) and converts
- R95C Modbus hubs are a quick and economical way to integrate device signals into a Modbus system
- Rugged over-molded design meets IP65, IP67, and IP68
- Connects directly to a sensor or anywhere in-line for ease of use



Accessories



SMBR90S Mounting Bracket (use multiples to stack)



Housina

R95

LMBM12MAG Attaches to M12 cordset end (magnetic)



BWA-M12CAB-MAG Attaches to M12 cable (magnetic)



LMBM12SP Attaches to M12 cordset end

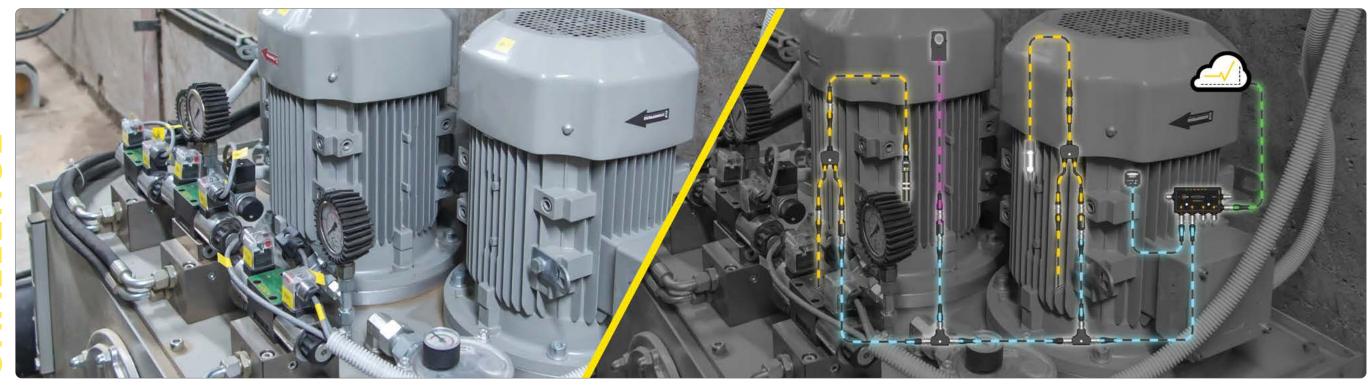


LMBS15MAG Attaches to S15C (magnetic)



LMBS15SP Attaches to S15C

bannerengineering.com



Keep Hydraulic Power Units at Peak Performance

Challenge

Monitor the pressure, current, oil temperature, and motor vibration/ temperature of hydraulic power units and other hydraulic machinery.

Solution

Condition monitoring makes it possible to ensure that all equipment is working at optimal efficiency, and to detect and address potential maintenance issues before they lead to costly production downtime.

The Snap Signal system is designed to be a brand-agnostic, overlayarchitecture technology, meaning that there's no need to replace existing hydraulic systems or even older sensors. Snap Signal converters, adapters, or filters can be installed to branch off from existing sensors and send Modbus signals to a Banner DXMR90 Industrial Controller device. This controller combines multiple Modbus signals—potentially from an entire production environment—into a single data stream that can be processed in cloud networks, including Banner's own Cloud Data Services (CDS). Then, users can monitor equipment performance data from anywhere with online visualization tools, and receive 24/7 notifications about any hydraulic component operating below customizable thresholds. Additionally, monitored machine health can be displayed on site using connected indicators, such as Banner tower lights.



S15C Converter

S15C converters take various types of signals including discrete, analog, and RTD, transforming them to smart protocols like IO-Link or Modbus.



R45C Converter

The R45C compact in-line compact in line converters enables communication between IO-Link and Modbus devices and equipment that respond to analog signals.



R90C Hub

The R90C Hub converts and consolidates discrete signals from legacy devices into an IO-Link data stream compatible with other devices including Banner's new IO-Link master.



R95C Hub

The R95C Hubs convert and consolidate discrete and analog signals into an IO-Link or Modbus data stream compatible with other devices including Banner's IO-Link masters or DXM Controllers.

bannerengineering.com

SNAP SIGNAL NETWORK

Build Your Network

With signals now on unified protocols, it is time to build networks of devices. IO-Link devices and anything that was translated to IO-Link using Snap Signal converters should be connected to an IO-Link master. Multiple IO-Link masters can be used, depending on the size and complexity of the system.

The network stage of the Snap Signal process also supports serial protocols and wireless cable replacement products such as the R70 Serial Data Radio. These radios excel in scenarios where running long lengths of cable is not practical or economical.

IO-Link masters and wireless radios can send collected signals from your entire production system to a device that interprets Modbus data, such as the Banner DXMR90 Industrial Controller.





R45C IO-Link Master Modbus Converter

- Connects two IO-Link devices and provides access via Modbus RTU interface
- Rugged design; easy installation with no assembly or individual wiring required
- 5-pin M12 male quick disconnect connector
- Two 4-pin M12 female guick disconnect connectors
- Built-in indication for two IO-Link master ports
- Built-in indication for Modbus RTU connection status
- Rugged over-molded design meets IP65, IP67, and IP68

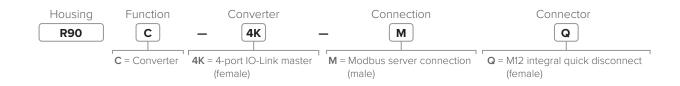


R90C IO-Link Master Modbus Converter

The R90C 4-Port IO-Link Master connects to four IO-Link devices and provides access to IO-Link data and functionality via a Modbus RTU connection. Modbus registers allow for access to both IO-Link devices and their functions:

- Process Data In
- Process Data Out
- Connected device information
- ISDU data
- Discrete I/O configuration
- IO-Link events
- Data storage
- SIO mode





SNAP SIGNAL NETWORK



R70 Data Radio

R70 Serial Data Radios are compact, industrial, low-power wireless communications devices used to extend the range of serial communications networks. R70 Ethernet Data Radios are wireless industrial communication devices used to create point-to-multipoint configurations of wireless Ethernet networks.

- Star or tree network topology configuration
- DIP switches select operational modes
- Frequency Hopping Spread Spectrum (FHSS) technology ensures reliable data delivery
- Self-healing, auto-routing radio frequency network with multiple hops to extend the network's range

Description	Communication Type	Frequency	Transmit Power	Models
		900 MHz ISM Band	1 Watt	R70SR9MQ
	Serial	2.4 GHz ISM Band	65 mW (100 mW EIRP)	R70SR2MQ
One individual unit	Calco and calc	900 MHz ISM Band	500 mW	R70ER9MQ
	Ethernet	2.4 GHz ISM Band	65 mW (100 mW EIRP)	R70ER2MQ
Pre-bound client/		900 MHz ISM Band	1 Watt	R70KSR9MQ
server pair	Serial	2.4 GHz ISM Band	65 mW (100 mW EIRP)	R70KSR2MQ

Tees





	Models	Cable Lengths		Pinout	
	Wodels	Branches (Female) Trunk (Male)			
E 0':-	CSB-M1250M1250-T	No Branch	No Trunk	Female 1	
5-Pin	CSB-M1250M1250-A	No Branch	No Trunk	3 = Blue 4 = Black 5 = Gray	

Accessories







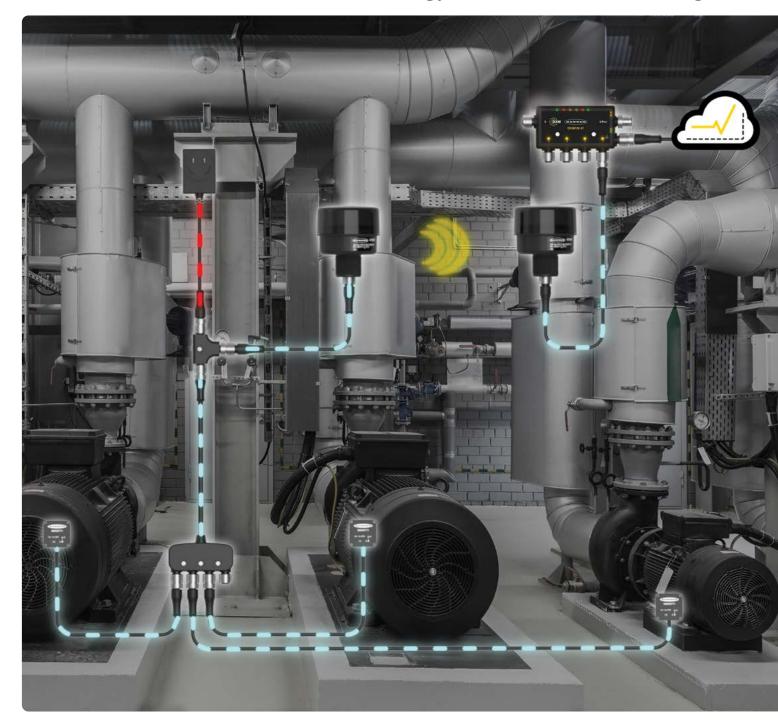
Power Supply



SPS30* In-Line AC/DC Converter

*Contact Banner for model numbers

Combine Wired and Wireless Technology for Condition Monitoring



HALLENGE



Monitor Tank Level Remotely

Challenge

Provide real-time tank level monitoring data to efficiently manage inventory.

Solution

Tap into existing devices like sensors and lights, or add new ones. Snap Signal products connect sensors of all signal types to bring tank level data onto your industrial network or to the cloud. Configure and deploy with plug-and-play converters and cables. Quickly send data to the cloud with our IoT edge gateways. Banner's cloud provides visualizations and storage.

To monitor existing tank level sensors, you can add a tee or splitter cable to harvest discrete or analog signals that are already installed on this equipment. This allows you to monitor these sensors without disrupting the existing control system. If you need to add the ability to measure level, temperature, and humidity, simply add in the corresponding sensors from Banner Engineering. Snap Signal Converters are used to convert each of these signals to a smart serial protocol so they can all communicate on a common network. Our DXMR90 Industrial Controller is added to collect the information in one place and send it wherever you need it; options include a SCADA system, PLC, or the cloud. If you do not have a cloud platform, check out Banner's Cloud Data Services (CDS), which is a turn-key platform for monitoring all your assets in one place and sending notifications when alarms occur.



R90C IO-Link Master

The R90C IO-Link master collects signals from IO-Link devices to a Snap Signal lloT system, or other control systems on the market, through four dedicated IO-Link ports.



R45C IO-Link Master

The R45C IO-Link master collects signals from IO-Link devices to a Snap Signal lloT system, or other control systems on the market through two dedicated IO-Link ports.



R70SR Serial Data Radio

The R70SR MultiHop Serial Data Radio extends the range of serial communication networks.

BANNER

SNAP SIGNAL DISTRIBUTE

Distribute Your Data

At this stage, the unified protocols are brought together so all the collected signal data from the entire system can be sent to a cloud platform, PLC, HMI, or SCADA. Banner's central control units for Snap Signal data distribution are the DXMR90 and DXMR110 industrial controllers, which feature a D-Code Ethernet port to transmit collected data. It is also possible to connect the controller to a DXM1200 device, which uses a cellular modem to transmit data wirelessly.



DXMR90

DXMR90 controllers are a central component of Banner's Snap Signal system for device monitoring. The industrial controllers house a processor that receives signals from sensors and other connected devices, through four dedicated Modbus or IO-Link ports. As a centralized hub, the DXMR90 combines all of these signals into one unified stream of insightful data, which can be exported out through industrial Ethernet protocols.



Ethernet Connection	Modbus Connections	Other Connections	Models
One female M12 D-Code Ethernet connector	Four female M12 connections for Modbus master connections	One male M12 (Port 0) for incoming power and Modbus RS-485,	DXMR90-X1
One female M12 D-Code Ethernet connector	Four female M12 connections for IO-Link master connections	one female M12 for daisy chaining Port 0 signals	DXMR90-4K
Two female M12 D-Code Ethernet Connector	Four female M12 connections for Modbus client connections	One male M12 (Port 0) for incoming power and Modbus RS-485, one female M12 for outgoing power and daisy chaining Port 0 signals	DXMR90-X1E











On-board Programming and Scripting – MicroPython, ScriptBasic

Industrial Ethernet – EtherNet/IP, PROFINET, Modbus TCP Logic and Math operations

Serial Communications

Cloud Connectivity – Banner CDS, AWS IoT Core

Accessories



SMBR90S Mounting Bracket (use multiples to stack)



SMBR90RA Mounting Bracket



SMBR90RADIN

DIN Rail

Mounting Bracket



SMBR90RAMAG Magnetic Mounting Bracket



PSW-24-1 Power Supply



STP-M12D-406 Ethernet Cordset

SNAP SIGNAL DISTRIBUTE



DXMR110-8K IO-Link Master

- · Local control or connectivity with automation protocols, including EtherNet/IP, Modbus/TCP, and PROFINET
- Logic processing and problem-solving capable of deploying solutions to process and control data from multiple devices
- IP67 housing simplifies installation in any location by eliminating the need for a control cabinet
- Consolidate cable runs to minimize cabling and associated weight, especially in weight-critical applications such as robotics
- Flexible and customizable—expanded internal logic controller with action rules and ScriptBasic programming

Ethernet Connection		IO-Link Master Connections	Other Connections	Models
Two female M12 D-Cod connectors for daisy ch communication to a hig control system	aining and	Eight female M12 connections for IO-Link	One male M12 for incoming power, one female M12 for daisy chaining power	DXMR110-8K



DXM1200-X2 IIoT Gateway

- Harness the installation benefits of wireless devices along with the fast sample rates of wired devices
- Monitor more assets by connecting up to 200 devices to one gateway
- Quickly install the IP67-rated gateway anywhere with its rugged and sealed design
- Transform data at the edge with our DXM configuration tool or customize further with ScriptBasic or MicroPython
- Get your data where you need it by connecting to networks via Ethernet or Cellular

Series

DXM1200-X2

Radio Configuration



Blank = None

R1 = 900 MHz, 500 mW PE5 Performance Radio (North America)

R2 = 900 MHz, 500 mW HE5 MultiHop Data Radio (North America)

R3 = 2.4 GHz, 65 mW PE5 Performance Radio (Worldwide)

R4 = 2.4 GHz, 65 mW HE5 MultiHop Data Radio (Worldwide)

Accessories





(use multiples to stack)



SMBR90RA Mounting Bracket



SMBR90RADIN
DIN Rail
Mounting Bracket



SMBR90RAMAG Magnetic

Mounting Bracket



PSW-24-1 Power Supply



STP-M12D-406 Ethernet Cordset

BANNER



Know When to Add Raw Materials to Increase Machine Uptime

Challenge

Your machines need a constant supply of materials to keep production going. Knowing when they're running low is critical.

Solution

Let your machines tell you when they're low on materials. Snap Signal provides this data and makes it available for viewing anywhere it's needed.

Snap Signal lets you keep your current communications network in place. Simply tee into existing analog sensors that measure roll diameter. The sensor data is converted to a unified serial protocol via Snap Signal converters and sent to a DXMR90 Industrial Controller, which can bring this valuable data to Banner Cloud Data Services (CDS) via an Ethernet connection. The information may be visualized anywhere in the world on a dashboard, and call-for-parts messages can be sent automatically to people in the plant via SMS and email. At the machine level, an LED light, like the Banner WLS15 Pro, can also be used to indicate material level.



DXMR90 Industrial Controller

The DXMR90 industrial controller works with a wide range of serial devices. Actionable data is sent to the cloud directly from the DXMR90. Alerts can be set locally or in the cloud to respond to potential failures quickly.

BANNER

SNAP SIGNAL CONSUME

Consume Data to Optimize Productivity

The data gathered from the system needs to be displayed so that machine operators, maintenance staff, and plant managers can make data-driven decisions. The data may be consumed via HMIs, PLCs, SCADA, or cloud platforms including Banner's Cloud Data Services (CDS), offering customizable dashboards for simultaneous and comprehensive online monitoring of devices in Snap Signal systems.

Ultimately, the goal of Snap Signal is to make data available to the people who need it, so that they can make informed decisions about improving processes or troubleshooting problems, thereby improving production throughput, quality, and uptime.



Monitor Your Equipment from Anywhere

The Cloud Data Services software is a web-based platform that allows users to access, store, protect, and export critical data collected by Banner Snap Signal solutions. The software complements the Snap Signal portfolio and provides customers with complete end-to-end IIoT solutions to solve the Industrial market's most pressing problems.

Banner CDS

- The CDS platform is more than a dashboard. With analytics and visualization tools, the software delivers actionable insights that allow you to solve real challenges on the factory floor.
- You can remotely access data anytime and anywhere using an internet-connected device. In addition, you can define parameters
 to control when to receive notifications via email or SMS message. On-demand visibility and real-time alerts allow you to remotely
 monitor and diagnose systems quickly, saving time and costs.
- Predictive maintenance is a key capability of Banner's IIoT solutions. The software platform helps you use device data to predict
 machine maintenance requirements, which reduces unplanned downtime, increases mean time between failure (MTBF), and
 reduces maintenance costs.
- Data transmissions from your controller are secured via several layers of protection including a proprietary communication protocol and generic data transfer. In addition, data transmissions from the controller to the cloud are securely encrypted.

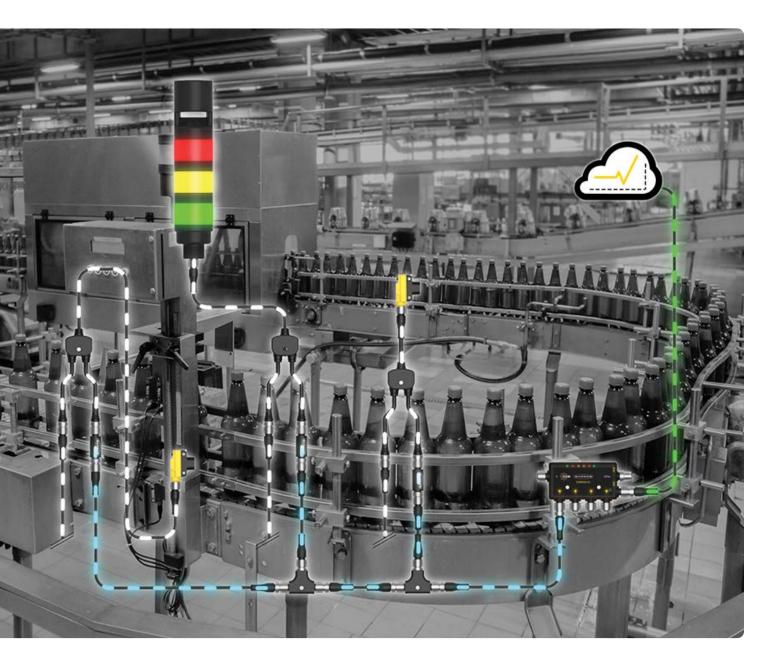
HMI, SCADA, PLC, or Other Monitoring Platforms

- Snap Signal's unique open architecture allows you to send data where you need it.
- The DXMR90 supports EtherNet/IP®, Modbus/TCP, PROFINET, and Modbus RTU so that data can be interfaced with virtually any industrial system.



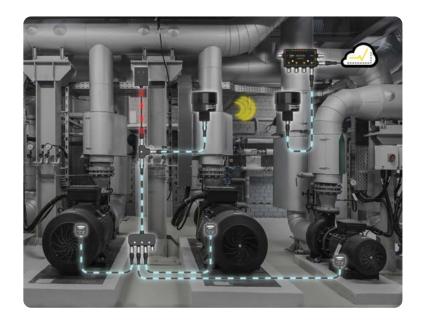
Visit bannercds.com for more information

SNAP SIGNAL



Monitor Your Conveyor System Optimally and Set Alerts in Banner's Cloud Data Services (CDS)

- Identify and correct the source of reduced output in one or multiple production lines with Snap Signal
- Use existing legacy sensors that are already installed to offer valuable insights on process states and error conditions, without disturbing the existing controls system
- Monitor machine performance and help optimize throughput via sensor data sent to Banner CDS

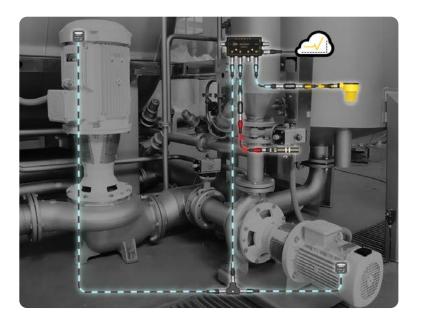


Flexibly Combine Wired and Wireless Technology for Condition Monitoring

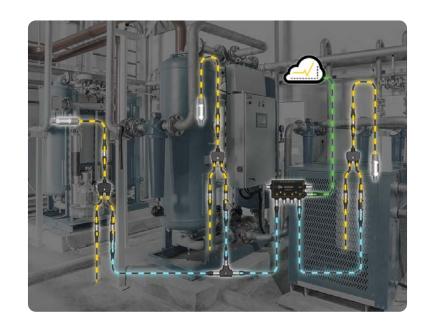
- Deploy R70 Serial Radios to send vibration data of machines across your factory to the DXMR90
- Monitor vibration to detect potential failures before downtime occurs
- Send actionable vibration data and alerts to Banner CDS
- Data can also be sent directly to a PLC or SCADA via Modbus TCP, EtherNet/IP, and PROFINET

Monitor Vibration, Tank Level, and Temperature of Existing Equipment

- Add Snap Signal converters and sensors that can measure machine conditions, such as vibration, tank level, and temperature
- Send data to the DXMR90 for real-time condition monitoring
- Set alerts locally or in the cloud to respond to potential failures quickly and keep your equipment running



BANNER

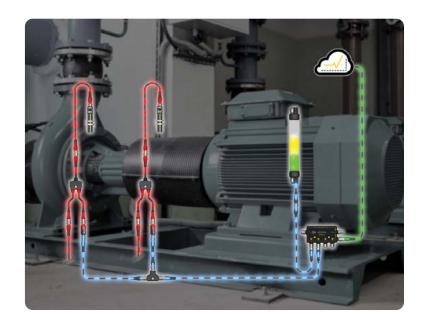


Tap into Pressure Sensor Data for Immediate Insights

- Monitor system pressure at various locations in real-time
- Use active monitoring to quickly identify potential failures or leaks
- Combine incoming pressure sensor information for a comprehensive data stream to the cloud
- Data can also be sent directly to a PLC or SCADA via Modbus TCP, EtherNet/IP, and PROFINET

Monitor System Temperature and Set Alerts in Banner's Cloud Data Services (CDS)

- Bring legacy sensor signals to the cloud for better insights about your machine's health
- Monitor surface temperature to detect overheating parts and collect sensor data via a network of cordsets and the DMXR90 controller
- Create an overlay architecture with easy to implement splitters and M12 cordsets
- Send data to the cloud for consumption, data dashboarding, and setting up email and text alerts

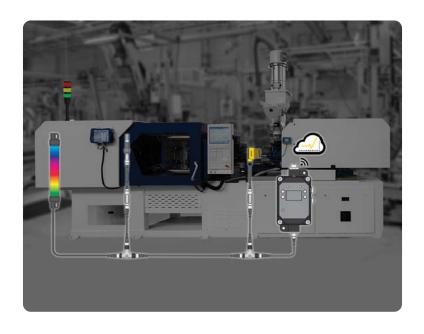




Condition Monitoring of Dust Collection System

- Snap Signal converters provide monitoring data so users can spot small performance changes
- Problems that can be fixed early and fully with predictive maintenance
- Snap Signal converters offer easy, quick-connect setup at all key system points, monitoring vibration and temperature, boiler temperatures, level, and differential pressure
- Start with key equipment with one area or monitor your whole facility with ease and speed





Increase Productivity on an Injection Molding Machine

- Manage your process better and improve productivity and quality
- Snap Signal products interface with existing level sensors and temperature/humidity probes
- To monitor existing sensors and lights, you can add a tee or splitter cable to harvest discrete or analog signals that are already installed without disrupting the existing control system
- Convert each of these signals to a smart serial protocol so they can all communicate on a common network

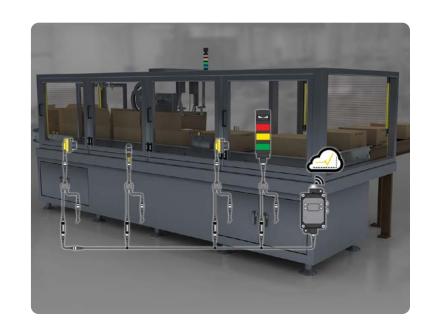


Monitor Leaks and Receive Real-Time Alerts

- Help personnel respond quickly to reduce downtime
- Banner's fiber optic sensors and amplifiers can work together to easily detect leaks
- An industrial controller can send critical information about the leak to a cloud service
- Instantly send alerts via text or email to personnel who can immediately take corrective action
- Send actionable data and alerts to Banner's Cloud Data Services (CDS)
- Data can also be sent directly to a PLC or SCADA via Modbus TCP, EtherNet/IP, and PROFINET

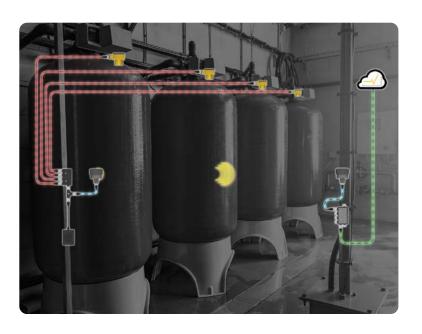
Measure Throughput and OEE on a Case Sealer

- · Collect data from your existing sensors.
- To monitor existing sensors and lights, add a tee or splitter cable to harvest discrete signals that are already installed without disrupting the existing control system
- Convert each of these signals to a serial protocol so they can all communicate on a common network
- Collect the information in one place and send it wherever you need it; options include a SCADA system, PLC, or the cloud



Bring in IO-Link Sensor Data for Tank Level Applications Wirelessly

- Banner's IO-Link masters allow you to bring back IO-Link sensor data wirelessly
- Easy to set up, interpret the results, and monitor locally and through a cloud-based system
- Report and send alarms on user-specified levels locally via outputs to lights and relays, or via emails and text messages
- Information can be sent to the cloud by connecting to the local area network (LAN) with an Ethernet cable directly to the DXMR90 Industrial Controller
- Data can also be sent directly to a PLC or SCADA via Modbus TCP, EtherNet/IP, and PROFINET



BANNER

Smarter Automation. Better Solutions.™

Banner Engineering designs and manufactures industrial automation products including sensors, smart IIoT and industrial wireless technologies, LED lights and indicators, measurement devices, machine safety equipment, as well as barcode scanners and machine vision. These solutions help make many of the things we use every day, from food and medicine to cars and electronics. A high-quality, reliable Banner product is installed somewhere around the world every two seconds. Headquartered in Minneapolis since 1966, Banner is an industry leader with more than 10,000 products, operations on five continents, and a world-wide team of more than 5,500 employees and partners. Our dedication to innovation and personable service makes Banner a trusted source of smart automation technologies to customers around the globe.







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