# SNAP SIGNAL®

## IIoT Made Easy

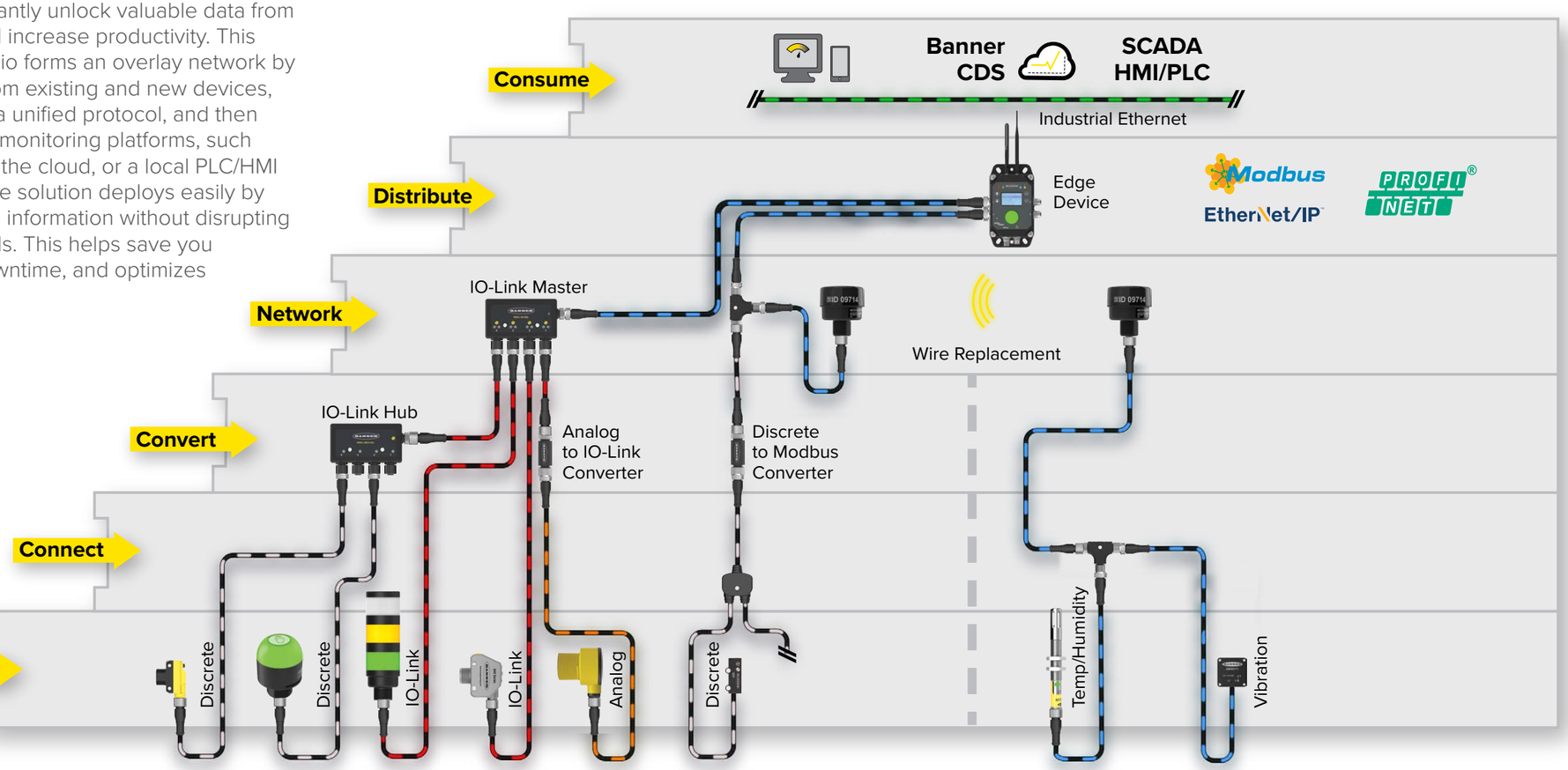



BANNER®

ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

### 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 smart-factory portfolio forms an overlay network by capturing signals from existing and new devices, converting them to a unified protocol, and then distributing them to monitoring platforms, such as SCADA systems, the cloud, or a local PLC/HMI for consumption. The solution deploys easily by leveraging available information without disrupting your existing controls. This helps save you money, reduces downtime, and optimizes your operations.






## 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.



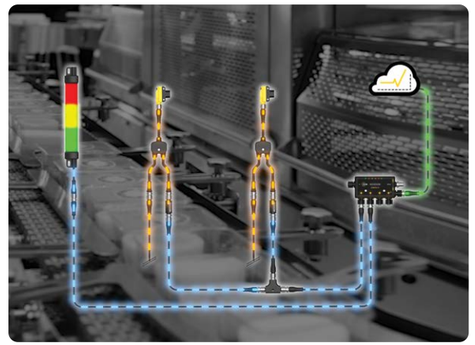






### Maximize Throughput and Reduce Downtime by Harnessing Sensor Data from Your Equipment

- 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



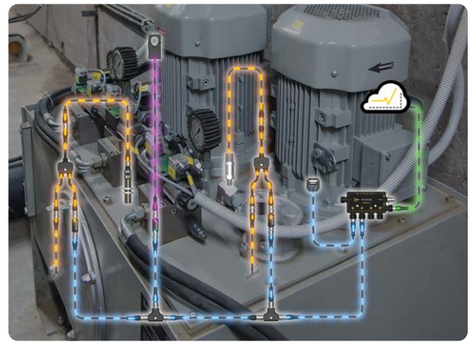


### Provide Real-Time Tank Level Monitoring Data to Efficiently Manage Inventory

- 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



Learn more at snapsignal.bannerengineering.com

# SNAP SIGNAL CAPTURE




## QM30VT Vibration and Temperature Sensor

- 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 | Number of Axis | Housing | Connection | Models |
|---|---|---|---|---|
| Vibration and temperature via RS-485 Modbus | 3 | Aluminium | 150 mm 5-pin M12 male QD | **QM30VT3-MQP** |
| | | 316L Stainless Steel | 150 mm 5-pin M12 male QD | **QM30VT3-SS-MQP** |
| | 2 | Aluminium | 2.09 m 5-pin M12 male QD | **QM30VT2** |
| | | | 150 mm 5-pin M12 male QD | **QM30VT2-QP** |
| | | 316L Stainless Steel | 150 mm 5-pin M12 male QD | **QM30VT2-SS-QP** |
| | | | 9.1 m flying leads | **QM30VT2-SS-9M** |
| Vibration and temperature via IO-Link | 3 | Aluminum | 150 mm 5-pin M12 male QD | **QM30VT3-KQP** |
| | | 316L Stainless Steel | 150 mm 5-pin M12 male QD | **QM30VT3-SS-KQP** |

## Current Monitoring Sensor

- Connects to the included current transformer and outputs the value to Modbus registers or IO-Link
- Monitors AC current for various devices using current transformers
- Converts a high-voltage input to a proportional low-voltage, low-current signal for measuring and monitoring
- Rugged over-molded design meets IP65, IP67, and IP68





| Description | Communication | Range | Model |
|---|---|---|---|
| Single-phase current monitoring sensors | Modbus | 0-20 Amps | **S15C-CT20A-MQ** |
| | IO-Link | 0-20 Amps | **S15C-CT20A-KQ** |
| | Modbus | 0-150 Amps | **S15C-CT150A-MQ** |
| | IO-Link | 0-150 Amps | **S15C-CT150A-KQ** |
| | Modbus | 0-600 Amps | **S15C-CT600A-MQ** |
| | IO-Link | 0-600 Amps | **S15C-CT600A-KQ** |
| Three-phase current monitoring sensors | Modbus | 0-20 Amps | **S15C-3CT20A-MQ-1** |
| | IO-Link | 0-20 Amps | **S15C-3CT20A-KQ-1** |
| | Modbus | 0-150 Amps | **S15C-3CT150A-MQ-1** |
| | IO-Link | 0-150 Amps | **S15C-3CT150A-KQ-1** |
| | Modbus | 0-600 Amps | **S15C-3CT600A-MQ-1** |
| | IO-Link | 0-600 Amps | **S15C-3CT600A-KQ-1** |





## 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 | 50 | **S15S-R500-MQ** |
| 1000 | | **S15S-R1000-MQ** |
| 3000 | 200 | **S15S-R3000-MQ** |
| 6000 | | **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 Temp 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

| Housing | Function | | Female | | Male | | Connector |
|---|---|---|---|---|---|---|---|
| **S15** | **S** | – | **T** | – | **M** | | **Q** |
| | **S** = Sensor | | **T** = T-GAGE | | **M** = Modbus | | **Q** = M12 integral quick disconnect |




## 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

| Housing | Function | | Female | | Male | Connector |
|---|---|---|---|---|---|---|
| **S15** | **S** | – | **TH** | – | **M** | **Q** |
| | **S** = Sensor | | **TH** = Temperature and humidity | | **M** = Modbus<br>**K**= IO-Link | **Q** = M12 integral quick disconnect |



## S15C In-Line Converter with Thermistor(s)

- Compact converter that connects to 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 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

| Housing | Function | | Female | | Male | Connector |
|---|---|---|---|---|---|---|
| **S15** | **C** | – | **TMS** | – | **M** | **Q** |
| | **C** = Converter | | **TMS** = Thermistor temperature probe<br>**DTMS** = Dual thermistor temperature probe | | **M** = Modbus | **Q** = M12 integral quick disconnect |



## 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

| Housing | Process Connection | Type | | Function | | Output | Connector |
|---|---|---|---|---|---|---|---|
| **S24** | **A** | **S** | – | **D** | – | **M** | **QP** |
| | **A** = 1/2" male NPT | **S** = Sensor | | **D** = Dew point | | **M** = Modbus | **QP** = 304 mm integral 4-pin M12 quick disconnect |



## 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 |
|---|---|---|---|---|
| Pressure sensor | Modbus | 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** |
| | | 0–150 PSI* | | **S15C-PS150C-MQ** |
| | | 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 level | Modbus | 300 mm to 3 m | 114 kHz | 230 mm integral 5-pin M12 male quick disconnect | **K50UX2CRA** |
| | | 100 mm to 1 m | 224 kHz | | **K50UX2ARA** |



## QM42 Differential Pressure Sensor

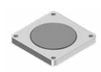
- Offers accurate low-differential pressure measurement of air and non-condensing, non-corrosive gases
- Silicon piezoresistive differential pressure core
- Aluminum alloy housing
- Sensing range from ±1 up to ± 20 inches of water column depending on the model
- RS-485 Modbus serial communication

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



**BWA-BK-005**
Center mounting 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-wireable M12 connectors.





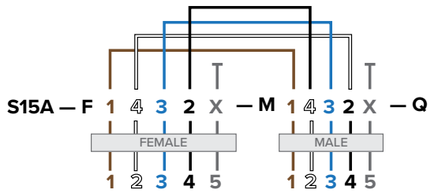
## S15A Wiring Adapter

- 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



**S15A — F1324X-M1324X — Q**

1–5 pin positions, number indicates destination female end first, then male

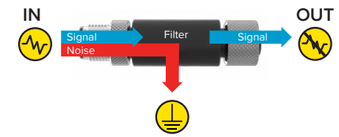



| Function Description | Model |
|---|---|
| Pin 2 goes to Pin 4 in both directions | **S15A-F14325-M14325-Q** |
| Female Pin 4 goes to Male Pin 5 | **S15A-F1235X-M123X4-Q** |
| Female Pin 2 goes to Male Pin 5 | **S15A-F1534X-M1X342-Q** |
| Pin 1 is open; all others pass through | **S15A-FX2345-MX2345-Q** |
| 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




**S15F — 30V — Q**

**30V** = 30 V DC voltage suppressor
**H-500** = Hi-impedance filter 500 mA max
**L-4000** = Low-impedance filter 4000 mA max

| 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** |



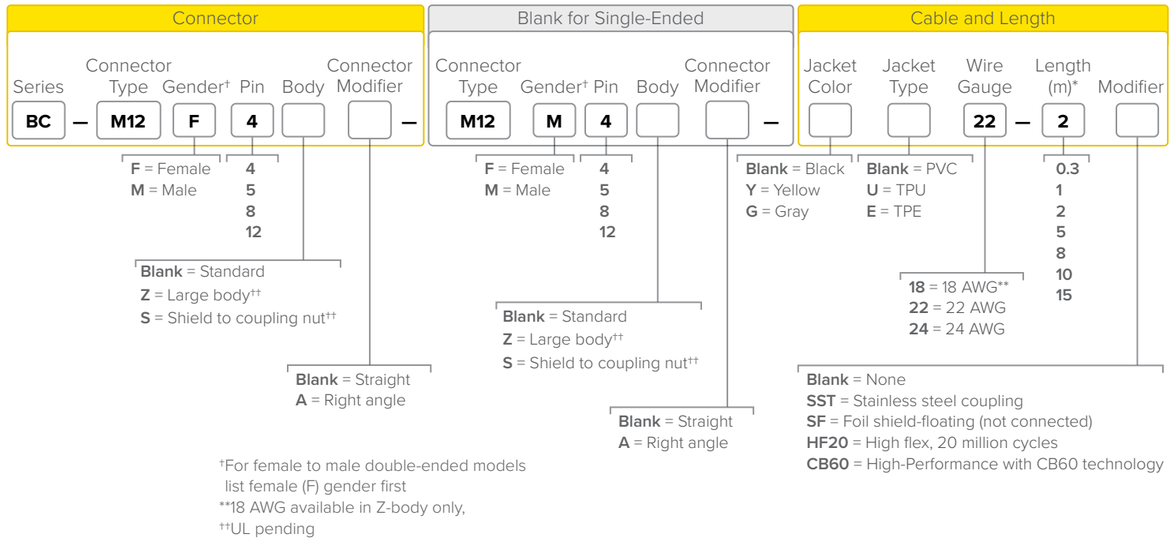
## S15J In-Line Fuse

- 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** |

***Custom lengths available.**
Please contact Banner for other available styles, and custom capabilities.

## M12 Signal Cordsets




†For female to male double-ended models list female (F) gender first
**18 AWG available in Z-body only,
††UL pending

| | | | |
|---|---|---|---|
| **Vibration Shock** | Meets IEC 60068-2-6 requirements | **Temperature** | -40° to +70 °C |
| **Mechanical Shock** | Meets IEC 60068-2-27 requirements | **Environmental Rating** | IP66, IP67, IP68, NEMA 1, UL Type 1 |
| | | **Certifications** | CE, cULus LISTED |

### 4-Pin PVC A-Code (Voltage: 30 V DC, Current: 4 A, AWG: 22, Cable ø: 5.2 mm)



| Description | Length* | Straight | Right-Angle | Pinout |
|---|---|---|---|---|
| Female QD to Flying Leads | 2 m | BC-M12F4-22-2 | BC-M12F4A-22-2 | Female: 1 2 3 4 5 |
| | 5 m | BC-M12F4-22-5 | BC-M12F4A-22-5 | |
| | 10 m | BC-M12F4-22-10 | BC-M12F4A-22-10 | |
| Male QD to Flying Leads | 2 m | BC-M12M4-22-2 | — | Male: 2 1 3 4 |
| | 5 m | BC-M12M4-22-5 | — | |
| | 10 m | BC-M12M4-22-10 | — | |
| Description | Length* | Straight/Straight (Female/Male) | Straight/Right-Angle (Female/Male) | |
| Double-Ended | 2 m | BC-M12F4-M12M4-22-2 | BC-M12F4-M12M4A-22-2 | |
| | 5 m | BC-M12F4-M12M4-22-5 | BC-M12F4-M12M4A-22-5 | |
| | 10 m | BC-M12F4-M12M4-22-10 | BC-M12F4-M12M4A-22-10 | |

**1** = Brown
**2** = White
**3** = Blue
**4** = Black
**5** = Unused



### 5-Pin PVC A-Code (Voltage: 30 V DC, Current: 4 A, AWG: 22, Cable ø: 5.6 mm)



| Description | Length* | Straight | Right-Angle | Pinout |
|---|---|---|---|---|
| Female QD to Flying Leads | 2 m | BC-M12F5-22-2 | BC-M12F5A-22-2 | Female: 1 2 3 4 5 |
| | 5 m | BC-M12F5-22-5 | BC-M12F5A-22-5 | |
| | 10 m | BC-M12F5-22-10 | BC-M12F5A-22-10 | |
| Male QD to Flying Leads | 2 m | BC-M12M5-22-2 | BC-M12M5A-22-2 | |
| | 5 m | BC-M12M5-22-5 | BC-M12M5A-22-5 | |
| | 10 m | BC-M12M5-22-10 | BC-M12M5A-22-10 | |
| Description | Length* | Straight/Straight (Female/Male) | Straight/Right-Angle | |
| Double-Ended | 2 m | BC-M12F5-M12M5-22-2 | BC-M12F5-M12M5A-22-2 | |
| | 5 m | BC-M12F5-M12M5-22-5 | BC-M12F5-M12M5A-22-5 | |
| | 10 m | BC-M12F5-M12M5-22-10 | BC-M12F5-M12M5A-22-10 | |

**1** = Brown
**2** = White
**3** = Blue
**4** = Black
**5** = Gray

## M12 Coiled Cordsets

| | | | |
|---|---|---|---|
| **Cable Jacket** | PVC | **Temperature** | -40° to +105 °C |
| **Vibration Shock** | Meets IEC 60068-2-6 requirements | **Environmental Rating** | IP67, IP69, NEMA 1, 3, 4, 6P, 13 |
| **Mechanical Shock** | Meets IEC 60068-2-27 requirements | | |

### 4-Pin A-Code (Voltage: 60 V DC, Current: 4 A, AWG: 22, Cable ø: 5.2 mm)



| Description | Length* (retracted to extended) | Straight | Pinout |
|---|---|---|---|
| Female QD to Flying Leads | 0.8 to 1.7 m | MQDC-401.7M-PUR-C | Female: 1 2 3 4 5 |
| | 1.0 to 2.6 m | MQDC-402.6M-PUR-C | |
| | 1.2 to 3.3 m | MQDC-403.3M-PUR-C | |
| Description | Length* (retracted to extended) | Straight/Straight (Female/Male) | Pinout |
| Double-Ended | 0.8 to 1.7 m | MQDEC-401.7M-PUR-C | Female: 1 2 3 4 5 |
| | 1.0 to 2.6 m | MQDEC-403.3M-PUR-C | Male: 3 2 4 1 |

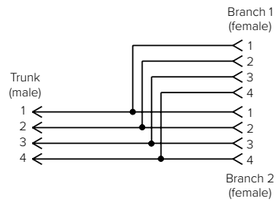
**1** = Brown
**2** = White
**3** = Blue
**4** = Black
**5** = Unused

***Custom lengths available.**
Please contact Banner for other available styles, and custom capabilities.

## Flat QD Splitters

| | | | |
|---|---|---|---|
| **Cable Jacket** | PVC | **Temperature** | –40 °C to +105 °C |
| **Overmold** | Black PUR | **Environmental Rating** | IP67 |

**Example of Parallel 4-Pin Wiring**






### 4-Pin A-Code (Voltage: 30 V DC/AC, Current: 4 A, AWG: 22, Trunk Cable ø: 4.4 mm, Branch Cable ø: 5.5 mm)

| Cable Lengths* | | Models | Pinout |
|---|---|---|---|
| **Trunk** (Male) | **Branches** (Female) | | |
| No Trunk/Integral QD | 2 x 0.3 m | **CSB-M1240M1241** | Female / Male |
| 0.3 m | 2 x 0.3 m | **CSB-M1241M1241** | |
| 1 m | 2 x 1 m | **CSB-M1243M1243** | |
| 2.4 m | 2 x 0.3 m | **CSB-M1248M1241** | |
| 4.6 m | 2 x 0.3 m | **CSB-M12415M1241** | |
| 7.6 m Unterminated | 2 x 0.3 m | **CSB-UNT425M1241** | |

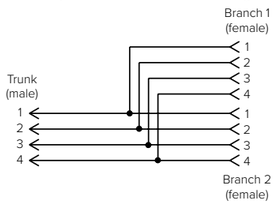


### 5-Pin A-Code (Voltage: 30 V DC/AC, Current: 4 A, AWG: 22, Cable ø: 5.9 mm)

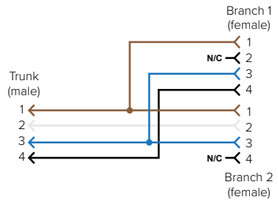
| Cable Lengths* | | Models | Pinout |
|---|---|---|---|
| **Trunk** | **Branches** | | |
| 0.3 m (Male) | 2 x 0.3 m (Female) | **CSB-M1251M1251B** | Female / Male |
| 0.3 m (Female) | 2 x 0.3 m (Male) | **CSB-M1251FM1251M** | |

## Round QD Splitters

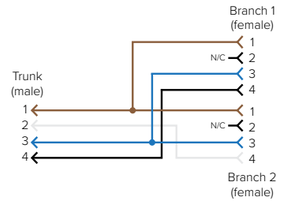
**Example of Parallel 4-Pin Wiring**

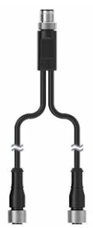



**S15YA24-M124-M124-0.2M**
**Non-parallel 4-Pin Wiring**




**S15YA4-M124-M124-0.2M**
**Non-parallel 4-Pin Wiring**



### 4-Pin A-Code

(Voltage: 30 V DC/AC, Current: 4 A, AWG: 4 x 22, Cable ø: 5.2 mm, Temperature: –40 °C to +70 °C, Environmental Rating: IP67)

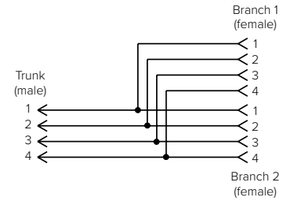
| Cable Lengths* | | Straight | Right-Angle | Wiring | Pinout |
|---|---|---|---|---|---|
| **Trunk** (Male) | **Branches** (Female) | | | | |
| No Trunk/ Integral M12 QD | 0.2 m | **S15YA24-M124-M124-0.2M** | — | See above | Male / Female |
| | 0.2 m | **S15YA4-M124-M124-0.2M** | — | Discrete | |
| | 0.2 m | **S15YB-M124-M124-0.2M** | — | Parallel | |



## Compact QD Splitters and Tees

| | | | |
|---|---|---|---|
| **Overmold** | Black PUR | **Environmental Rating** | IP67 |
| **Temperature** | –40 °C to +105 °C | | |

**Example of Parallel 4-Pin Wiring**






### 4-Pin A-Code (Voltage: 30 V DC/AC, Current: 4 A, AWG: 22)

| Ports | Models | Pinout |
|---|---|---|
| 1 x Male<br>2 x Female | **CSB-M1240M1240** | Female / Male |



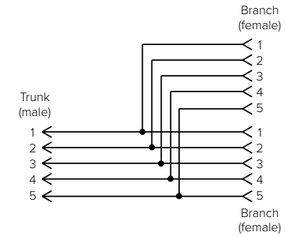
### 5-Pin A-Code (Voltage: 30 V DC/AC, Current: 4 A, AWG: 22)

| Ports | Models | Pinout |
|---|---|---|
| 1 x Male<br>1 x Female<br>1 x Female | **CSB-M1250M1250-T** | Female / Male |
| 1 x Male<br>2 x Female | **CSB-M1250M1250A** | |

## Multi-port Splitters

| | | | |
|---|---|---|---|
| **Cable Jacket** | PVC | **Temperature** | –40 °C to +105 °C |
| **Overmold** | Black PUR | **Environmental Rating** | IP67 |

**Example of Parallel 5-Pin Wiring**
**(diagram applies to all branches)**






### 5-Pin A-Code (Voltage: 30 V DC/AC, Current: 4 A, AWG: 4 x 22, Cable ø: 5.6 mm)

| Cable Lengths* | | Models | Pinout |
|---|---|---|---|
| **Branches** (Female) | **Trunk** (Male) | | |
| 4 x No Branch/Integral QD | 0.3 m | **CSB4-M1251M1250** | Female / Male |

***Custom lengths available.**
Please contact Banner for other available styles, and custom capabilities.

## RJ45 Data Cordsets

| Connector | | | | | | | Length |
|---|---|---|---|---|---|---|---|
| Series | | Connector Type† | | Gender | | Connector Type | Length (m)* |
| **BCD** | – | **RJ45** | | **M** | – | **RJ45** | **2** |
| | | **M12D** = 4-pin D-Code<br>**M8** = 4-pin<br>**RJ45** = 8-pin RJ45 | | **M** = Male<br>**Blank** = RJ45 | | **RJ45** = 8-pin RJ45 | **0.5**<br>**1**<br>**2**<br>**3**<br>**5** |

Note: All cordsets are shielded to coupling nut

†For M12/M8 to RJ45 double-ended models list M12/M8 connector first

| | | | |
|---|---|---|---|
| **Cable Jacket** | PVC | **Environmental Rating** | IP20 |
| **Temperature** | -20° to +70 °C | **Certifications** | CE, cULus LISTED |

### 4-Pin D-Code (Voltage: 60 V DC/AC, Current: 1.5 A, AWG: 22, M12 Cable ø: 7 mm, M8 Cable ø: 5.8 mm)

| Description | Length* | Straight | Pinout |
|---|---|---|---|
| M12 Double-Ended Male QD to RJ45 | 2 m | BCD-M12DM-RJ45-2 | M12 Male: 1, 2, 3, 4 — M12 RJ45: 1, 8 |
| | 5 m | BCD-M12DM-RJ45-5 | |
| | 10 m | BCD-M12DM-RJ45-10 | |
| M8 Double-Ended Male QD to RJ45 | 2 m | BCD-M8M-RJ45-2 | M8 Male: 1, 2, 3, 4 — M8 RJ45: 1, 8 |
| | 5 m | BCD-M8M-RJ45-5 | |
| | 10 m | BCD-M8M-RJ45-10 | |

**1** = White/orange
**2** = Orange
**3** = White/green
**4** = Green

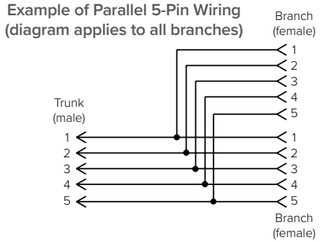
| Description | Length* | Straight/Straight (Female/Male) |
|---|---|---|
| Double-Ended RJ45 | 2 m | BCD-RJ45-RJ45-2 |
| | 5 m | BCD-RJ45-RJ45-5 |
| | 10 m | BCD-RJ45-RJ45-10 |

RJ45: 1, 8

## Molded Junction Blocks

| | | | |
|---|---|---|---|
| **Overmold** | Black PUR | **Environmental Rating** | IP65, IP67, and IP68 |
| **Temperature** | –40 °C to +70 °C | | |

Example of Parallel 5-Pin Wiring (diagram applies to all branches)




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

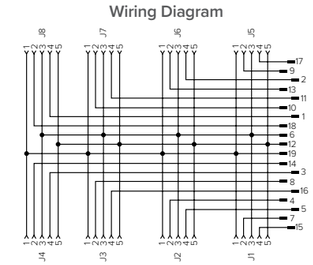


| Connections | Models | Pinout |
|---|---|---|
| 4 x Female M12<br>1 x Male M12 | R50-4M125-M125Q-P | Female: 1, 2, 3, 4, 5 |



| Connections | Models | Pinout |
|---|---|---|
| 8 x Female M12<br>1 x Male M12 | R95-8M125-M125Q-P | Male: 1, 2, 3, 4, 5 |

Wiring Diagram




## Molded I/O Junction Blocks

| | | | |
|---|---|---|---|
| **Temperature** | –40 °C to +70 °C | **Environmental Rating** | IP67 |
| | | **Certifications** | CE, cULus LISTED |

### 5-Pin (Voltage: 30 V DC/AC, Current: 8 A total per connector, AWG: 18 and 22, Cable ø: 9.2 mm)



| Cable Lengths* | | LED | Models | Pinout |
|---|---|---|---|---|
| **Branches** (Female) | **Trunk** | | | |
| 8 x No Branch/ Integral QD | 1 m with Flying Leads | PNP LED | R95-8M125-C1-D24P | Female: 1, 2, 3, 4, 5 |
| | 2 m with Flying Leads | | R95-8M125-C2-D24P | |
| | 5 m with Flying Leads | | R95-8M125-C5-D24P | |
| | 10 m with Flying Leads | | R95-8M125-C10-D24P | |
| | 0.3 m 19-pin M23 Male QD | | R95-8M125-0.3M23-D24P | |



| Cable Lengths* | | LED | Models | Pinout |
|---|---|---|---|---|
| **Branches** (Female) | **Trunk** | | | |
| 8 x No Branch/ Integral QD | 1 m with Flying Leads | No LED | R95-8M125-C1-D24 | Male: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 |
| | 2 m with Flying Leads | | R95-8M125-C2-D24 | |
| | 5 m with Flying Leads | | R95-8M125-C5-D24 | |
| | 10 m with Flying Leads | | R95-8M125-C10-D24 | |
| | 0.3 m 19-pin M23 Male QD | | R95-8M125-0.3M23-D24 | |

**1** = Purple
**2** = Red
**3** = Gray
**4** = Red/Blue
**5** = Green
**6** = Blue (18 AWG)
**7** = Gray/Pink
**8** = White/Green
**9** = White/Yellow
**10** = White/Gray
**11** = Black
**12** = Green/Yellow (18 AWG)
**13** = Yellow/Brown
**14** = Brown/Green
**15** = White
**16** = Yellow
**17** = Pink
**18** = Gray/Brown
**19** = Brown (18 AWG)

***Custom lengths available.**
Please contact Banner for other available styles, and custom capabilities.

## M12 Field Wireable

| | | | |
|---|---|---|---|
| **Terminal** | Screw | **Temperature** | -40° to +85 °C |
| | | **Environmental Rating** | IP68 |

### 4-Pin (Voltage: 60 V DC/AC, Current: 4 A, Max AWG: 22, Cable ø: 4-6 mm)



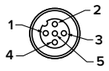
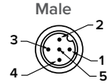


| Description | Straight | Right-Angle | Pinout |
|---|---|---|---|
| Female Screw Terminal | BFW-M12F4-6X | BFW-M12F4A-6X | Female  |
| Male Screw Terminal | BFW-M12M4-6X | BFW-M12M4A-6X | Male  |

### 5-Pin (Voltage: 60 V DC/AC, Current: 4 A, Max AWG: 22, Cable ø: 4-6 mm)





| Description | Straight | Right-Angle | Pinout |
|---|---|---|---|
| Female Screw Terminal | BFW-M12F5-6X | BFW-M12F5A-6X | Female  |
| Male Screw Terminal | BFW-M12M5-6X | BFW-M12M5A-6X | Male  |



## M12 Field Wireable Slide Lock

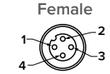
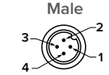
| | | | |
|---|---|---|---|
| **Terminal** | Slide Lock | **Temperature** | -40° to +85 °C |
| | | **Environmental Rating** | IP68 |


Slide Lock Terminal

### 4-Pin (Voltage: 60 V DC/AC, Current: 4 A, AWG: 20-24, Cable ø: 4-6 mm)



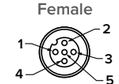
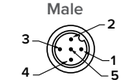


| Description | Straight | Right-Angle | Pinout |
|---|---|---|---|
| Female Slide Lock Terminal | BFW-M12F4-6SL | BFW-M12F4A-6SL | Female  |
| Male Slide Lock Terminal | BFW-M12M4-6SL | BFWM12M4A-6SL | Male  |

### 5-Pin (Voltage: 60 V DC/AC, Current: 4 A, AWG: 20-24, Cable ø: 4-6 mm)





| Description | Straight | Right-Angle | Pinout |
|---|---|---|---|
| Female Slide Lock Terminal | BFW-M12F5-6SL | BFW-M12F5A-6SL | Female  |
| Male Slide Lock Terminal | BFW-M12M5-6SL | BFWM12M5A-6SL | Male  |

## Accessories



**LMBM12MAG**
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.







ANALOG

PWM / PFM
Discrete (NPN/PNP)

Modbus

IO-Link®

## 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 IO-Link. 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** — **I** — **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
**RTD** = RTD Temperature Sensor




## 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

| Housing | Function | | Male | | Female 1 | Connector |
|---|---|---|---|---|---|---|
| **R45** | **C** | — | **K** | — | **I** | **Q** |

**C** = Converter
**K** = IO-Link
**I** = Analog current out
**U** = Analog voltage out
**Q** = M12 integral quick disconnect




## 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

| Housing | Function | | Male | Female 1 and 2 | Connector |
|---|---|---|---|---|---|
| **R45** | **C** | — | **K** | **II — II** | **Q** |

**C** = Converter
**K** = IO-Link
**II–II** = Analog 1 current in/out, analog 2 current in/out
**UU–UU** = Analog 1 voltage in/out, analog 2 voltage in/out
**Q** = M12 integral quick disconnect

# SNAP SIGNAL CONVERT




## 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| R90 | C | – | 4B21 | – | K | Q |

**C** = Converter
**4B21** = 4-port, bimodal, 2 inputs or 1 input/1 output per port
**K** = IO-Link
**Q** = M12 integral quick disconnect

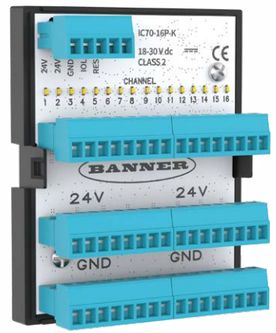



## R130C Discrete IO-Link Hub

- 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| R130 | C | – | 8P22 | – | K | Q |

**C** = Converter
**8P22** = 8-port, PNP with 2 inputs/outputs per port
**K** = IO-Link
**Q** = M12 integral quick disconnect




## 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 |
| 16-Channel NPN IO-Link Hub | | IC70-16N-K |






## 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| R95 | C | – | 8B22 | – | K | Q |

**C** = Converter
**8B21** = 8-port, bimodal, 2 inputs or 1 input/1 output per port
**8B22** = 8-port, bimodal, 2 inputs/outputs per port
**K** = IO-Link
**Q** = M12 integral quick disconnect




## R95C Discrete and Analog Input-Output IO-Link Hub

- 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| R95 | C | – | 4B4UI | – | K | Q |

**C** = Converter
**4B4UI** = 4-port, bimodal, 2 inputs/outputs per port 4-port, analog, 4 inputs and 4 outputs.
**K** = IO-Link
**Q** = M12 integral quick disconnect




## 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| R95 | C | – | 8UI | – | K | Q |

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

# SNAP SIGNAL CONVERT



## 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 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
- Simple M12 connection for easy installation wherever needed in the circuit
- S15CM models connect to a Modbus® device and output the value as a pulsed signal, either PFM or PWM

**S15C** – **I** – **MQ**

**I** = 4–20 mA
**U** = 0–10 V DC
**B22** = Discrete Inputs (NPN/PNP)

**S15CM** – **PP** – **MQ**

**PP** = PFM/PWM output




## 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| **R90** | **C** | – | **4UI** | – | **M** | **Q** |

**C** = Converter
**4UI** = 4-port, analog, 1 output per port
**M** = Modbus
**Q** = M12 integral quick disconnect




## 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

| Housing | Function | | Male | Female 1 and 2 | Connector |
|---|---|---|---|---|---|
| **R45** | **C** | – | **M** | **II — II** | **Q** |

**C** = Converter
**M** = Modbus
**II–II** = Analog 1 current in/out, analog 2 current in/out
**UU–UU** = Analog 1 voltage in/out, analog 2 voltage in/out
**Q** = M12 integral quick disconnect






## 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.

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| **R95** | **C** | – | **8B21** | – | **M** | **Q** |

**C** = Converter
**8B21** = 8-port, bimodal, 2 inputs or 1 input/1 output per port
**M** = Modbus
**Q** = M12 integral 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 to Modbus
- 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

| Housing | Function | | Converter | | Control | Connector |
|---|---|---|---|---|---|---|
| **R95** | **C** | – | **8UI** | – | **M** | **Q** |

**C** = Converter
**8UI** = 8-port, analog, 1 input per port
**M** = Modbus
**Q** = M12 integral quick disconnect

## Accessories



**SMBR90S**
Mounting Bracket (use multiples to stack)



**LMBM12MAG**
Attaches to M12 cordset end (magnetic)



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



**LMBM12SP**
Attaches to M12 cordset end

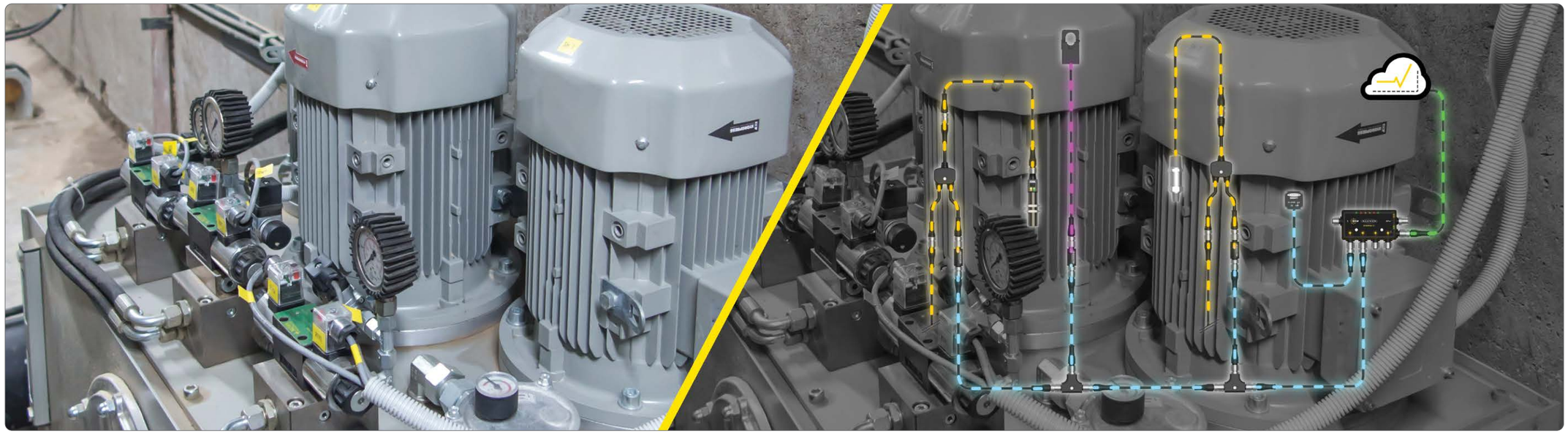


**LMBS15MAG**
Attaches to S15C (magnetic)



**LMBS15SP**
Attaches to S15C

CHALLENGE



SOLUTION

# 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, overlay-architecture 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 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.

## 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 quick 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

| Housing | Function | | Converter | | Connection | Connector |
|---|---|---|---|---|---|---|
| **R45** | **C** | – | **2K** | – | **M** | **Q** |
| | **C** = Converter | | **2K** = 2-port IO-Link master (female) | | **M** = Modbus server connection (male) | **Q** = M12 integral quick disconnect |




## 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

| Housing | Function | | Converter | | Connection | Connector |
|---|---|---|---|---|---|---|
| **R90** | **C** | – | **4K** | – | **M** | **Q** |
| | **C** = Converter | | **4K** = 4-port IO-Link master (female) | | **M** = Modbus server connection (male) | **Q** = M12 integral quick disconnect (female) |

# SNAP SIGNAL NETWORK



## DX700ER Ethernet Data Radio

- Commission and validate faster with an onboard LCD screen showing real-time signal strength, link quality, and network status—no laptop or software required
- Reduce troubleshooting time with an onboard Ethernet traffic monitor that provides a diagnostic view across the wireless link
- Retain wireless range in demanding industrial environments with in-cabinet design and an external antenna connector allowing for extension cables and high-gain antennas
- Extend established networks with R70ER radio compatibility
- Deploy in more regions with 900 MHz or 2.4 GHz ISM radio options

| Description | Configuration Method | Frequency | Connection | Models |
|---|---|---|---|---|
| DX700ER Ethernet Data Radio | LCD Menu | 900 MHz ISM Band | RJ45 | **DX700ER9M-H** |
| | | 2.4 GHz ISM Band | | **DX700ER2M-H** |



## R70 Ethernet Data Radio

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 |
|---|---|---|---|---|
| One individual unit | Serial | 900 MHz ISM Band | 500 mW | **R70ER9MQ** |
| | | 2.4 GHz ISM Band | 65 mW (100 mW EIRP) | **R70ER2MQ** |

## Accessories



**LMB30LP**
Mounting Bracket



**BWA-BK-020**
Two 80 lb
magnetic mounts



**PSW-24-1**
Power Supply



**SPS30***
In-Line
AC/DC Converter
*Contact Banner for model numbers





## R70 Serial Data Radio

R70 Serial Data Radios are compact, industrial, low-power wireless communications devices used to extend the range of serial communications 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 |
|---|---|---|---|---|
| One individual unit | Serial | 900 MHz ISM Band | 1 Watt | **R70SR9MQ** |
| | | 2.4 GHz ISM Band | 65 mW (100 mW EIRP) | **R70SR2MQ** |
| Pre-bound client/server pair | | 900 MHz ISM Band | 1 Watt | **R70KSR9MQ** |
| | | 2.4 GHz ISM Band | 65 mW (100 mW EIRP) | **R70KSR2MQ** |



## RS-485 Galvanic Isolator

- Eliminate ground loops and electrical faults by fully isolating RS-485 communication and power between network segments
- Maintain reliable communication in noisy environments by blocking surges, EMI, ESD, and voltage offsets without degrading signal quality
- Simplify installation with a rugged IP67 connectorized inline design that supports direct on-machine mounting

| Description | Model |
|---|---|
| RS-485 Galvanic Isolator | **S25GI-RS485-Q** |

## Accessories



**LMBLC25T**
Mounting Bracket



**LMBLC25TMAG**
Mounting Bracket (magnetic)

CHALLENGE



SOLUTION

# 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 IIoT 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 IIoT 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.

## 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 |
|---|---|---|---|
| 1 x Female M12 D-Code Ethernet connector | 4 x Female M12 connections for Modbus master connections | 1 x Male M12 (Port 0) for incoming power and Modbus RS-485<br>1 x Female M12 for daisy chaining Port 0 signals | **DXMR90-X1** |
| 1 x Female M12 D-Code Ethernet connector | 4 x Female M12 connections for IO-Link master connections | | **DXMR90-4K** |
| 2 x Female M12 D-Code Ethernet Connector | 4 x Female M12 connections for Modbus client connections | 1 x Male M12 (Port 0) for incoming power and Modbus RS-485<br>1 x 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



**R50C-POE-24Q**
Power over Ethernet (PoE) splitter for use with a PoE switch




## 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 |
|---|---|---|---|
| 2 x Female M12 D-Code Ethernet connectors for daisy chaining and communication to a higher-level control system | 8 x Female M12 connections for IO-Link | 1 x Male M12 for incoming power<br>1 x Female M12 for daisy chaining power | **DXMR110-8K** |




## DXMR190-8K Top-Exit IO-Link Master

- Two A-code or L-code pass-through power ports (depending on model) can share power with connected devices; high-amp L-code power allows more devices to be daisy-chained, simplifying cabling and installation
- Flexible configuration on each of eight A-code M12 IO-Link ports allows connection to either an IO-Link or discrete device
- Two D-code M12 multiprotocol ports with Ethernet pass-through minimize wiring and related costs, enabling easy integration into control systems via EtherNet/IP™, PROFINET®, or Modbus®

| Ethernet Connections | IO-Link Master Connections | Power Connections | Max. Total Current | Models |
|---|---|---|---|---|
| 2 x Female M12 D-Code Ethernet (for daisy chaining and communication to a higher-level control system) | 8 x Female M12 | 1 x Male A-Code M12 (in)<br>1 x Female A-Code M12 (out) | 4 A | **DXMR190-8K** |
| | | 1 x Male L-Code M12 (in)<br>1 x Female L-Code M12 (out) | 8 A | **DXMR190-L-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: **R1**

**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



**SMBR90S**
Mounting Bracket
(use multiples to stack)



**SMBR90RA**
Mounting Bracket



**SMBR90RADIN**
DIN Rail
Mounting Bracket



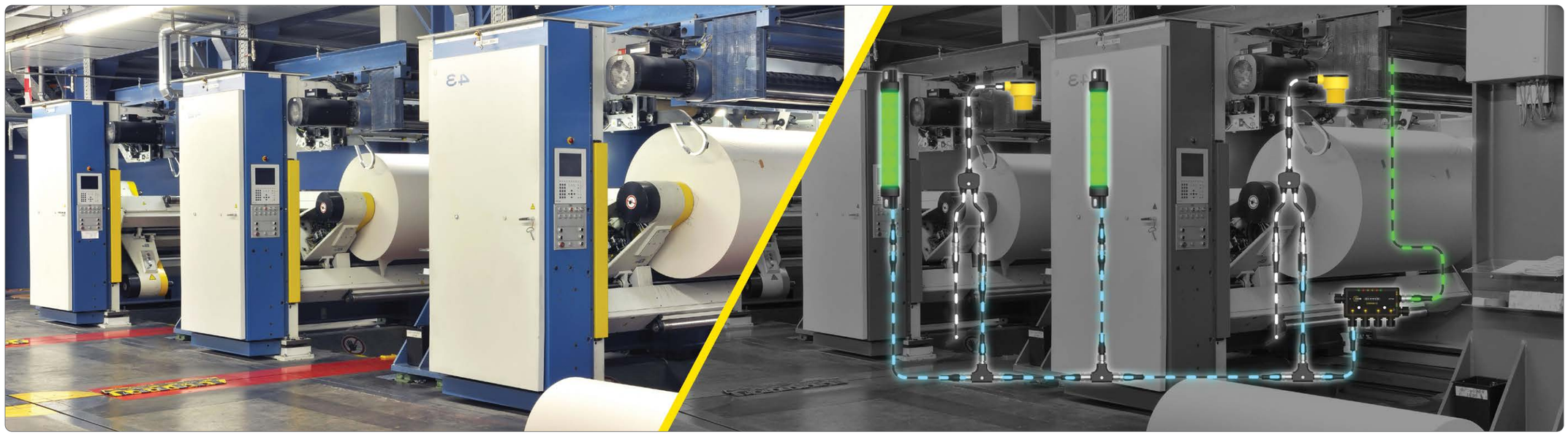
**SMBR90RAMAG**
Magnetic
Mounting Bracket



**PSW-24-1**
Power Supply



**R50C-POE-24Q**
Power over Ethernet (PoE) splitter for use with a PoE switch




# 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.



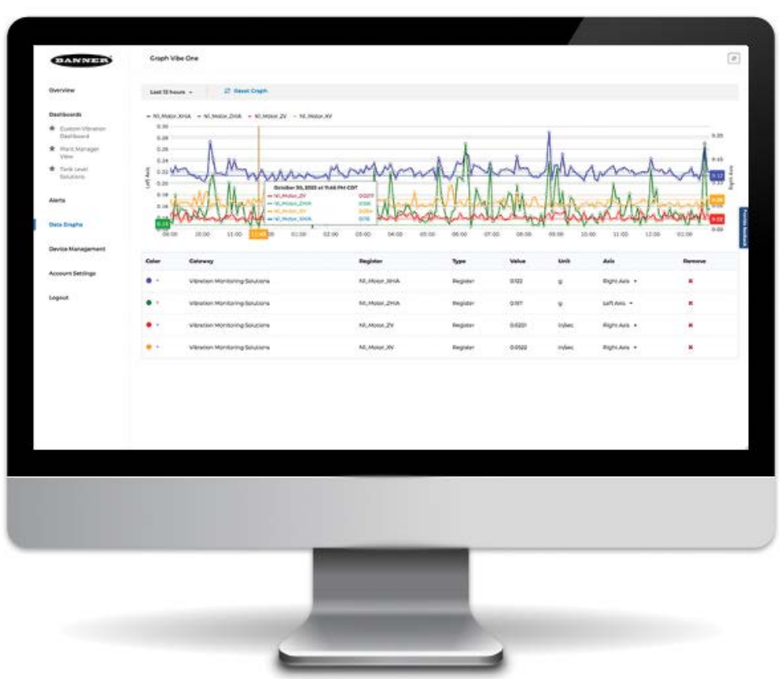

### DXMR90 Industrial Controller

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.

## 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

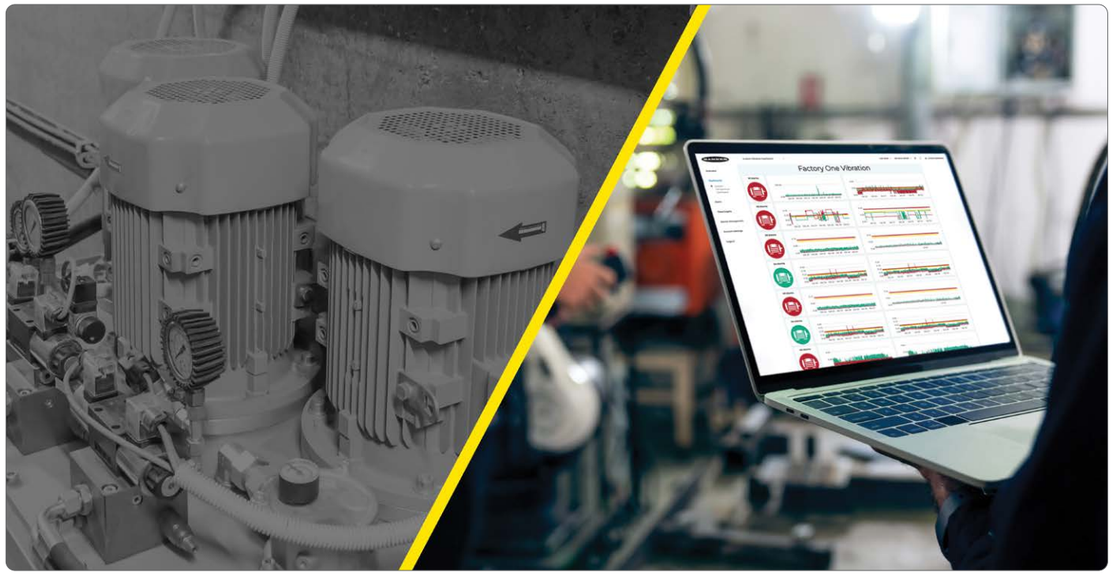
The Cloud Data Services software is a web-based platform that allows users to access, store, protect, and export critical data collected by Banner Snap Signal solutions. The software complements the Snap Signal portfolio and provides customers with complete end-to-end IIoT solutions to solve the Industrial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

**Banner CDS**

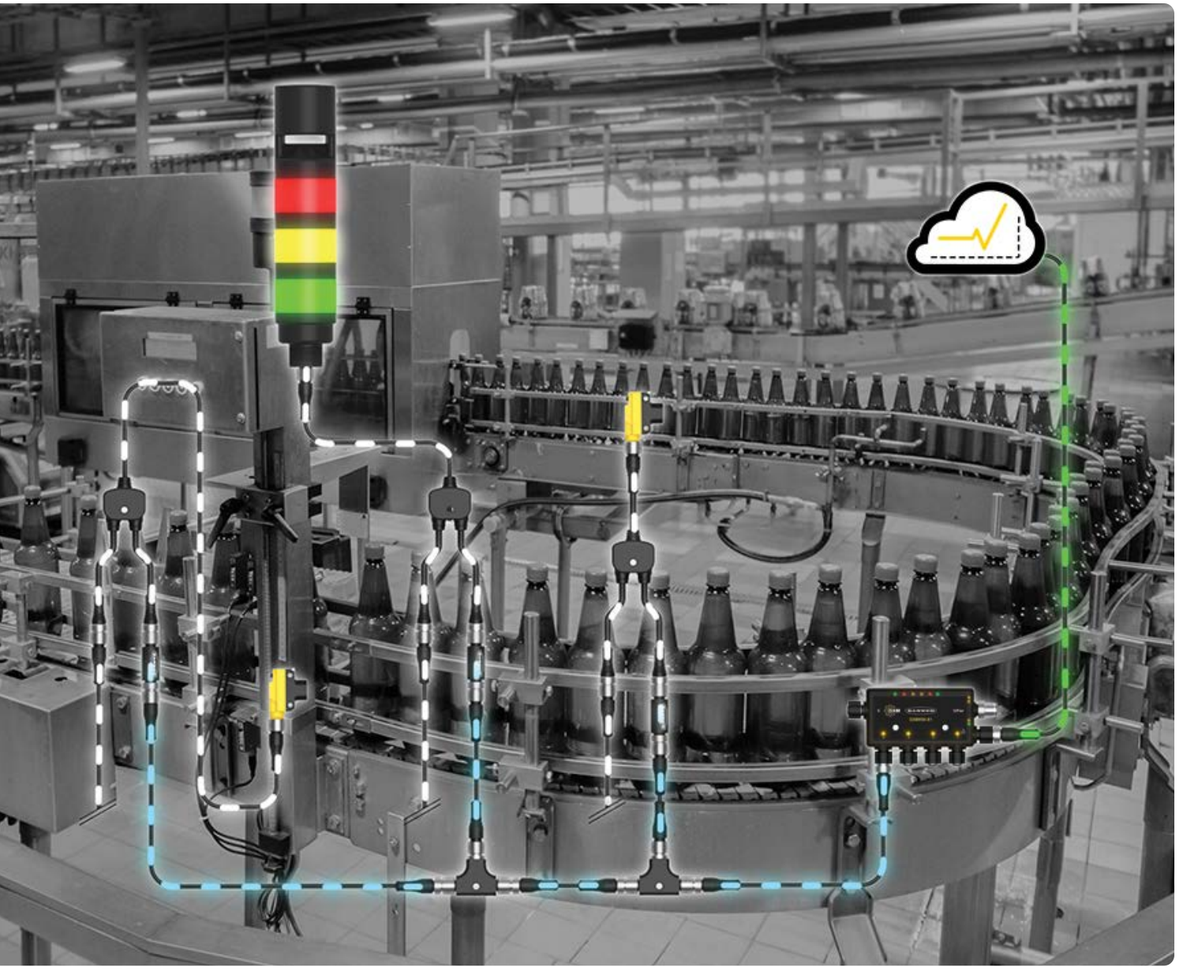
- The CDS platform is more than a dashboard. With analytics and visualization tools, the software delivers actionable insights that allow you to solve real challenges on the factory floor.
- You can remotely access data anytime and anywhere using an internet-connected device. In addition, you can define 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.

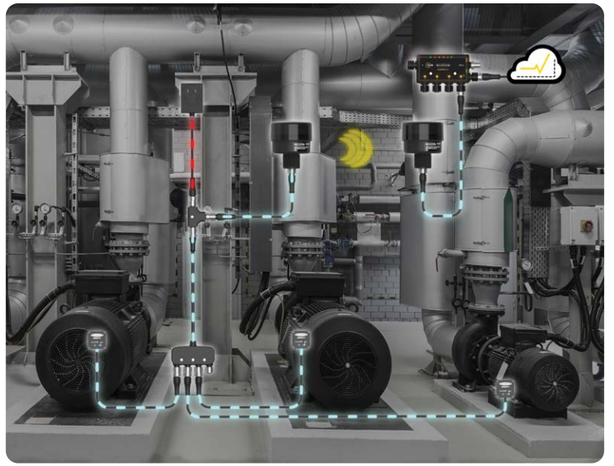



Visit **bannercds.com** for more information



## 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

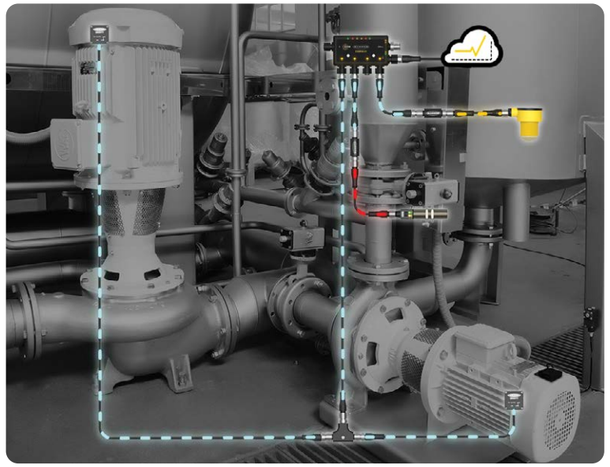


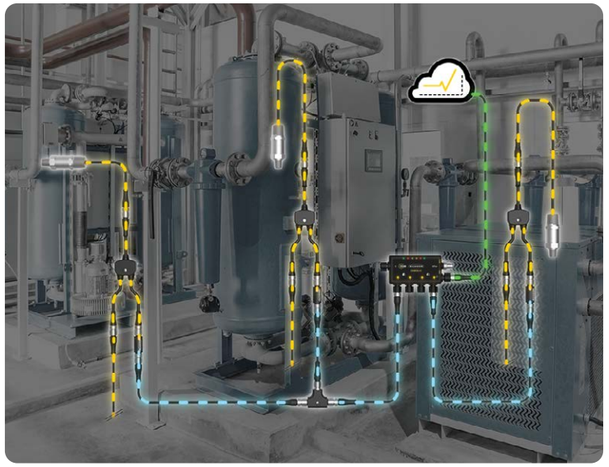
## Flexibly Combine Wired and Wireless Technology for Condition Monitoring

- 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



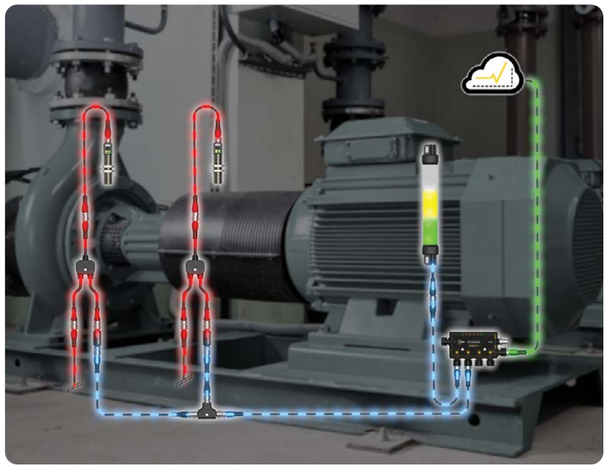


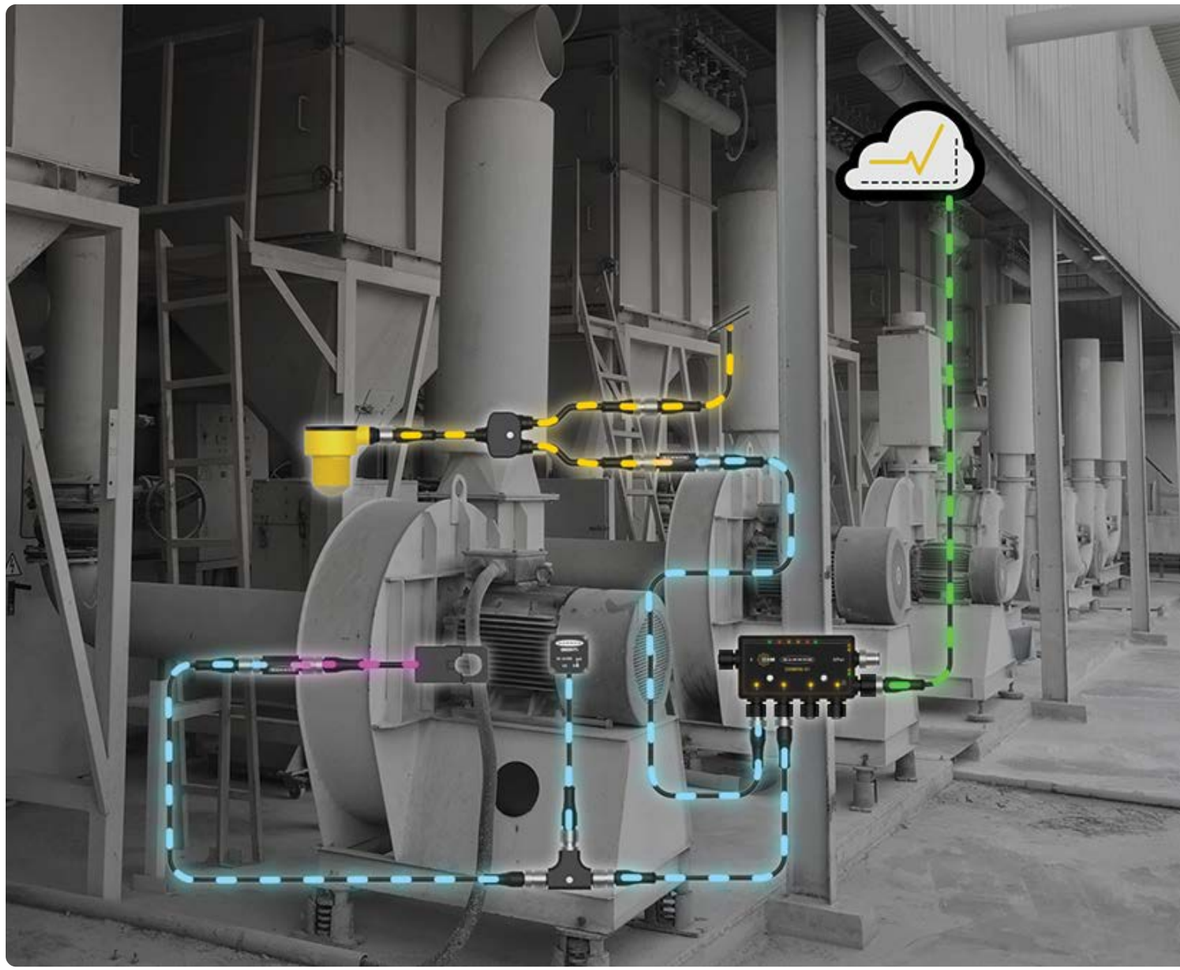
## Tap into Pressure Sensor Data for Immediate Insights

- 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 DXMR90 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

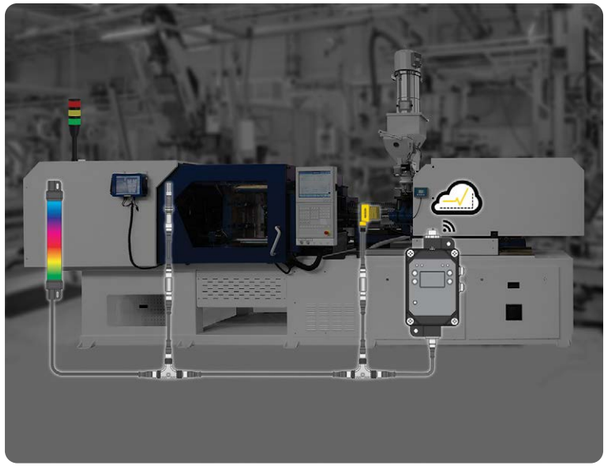




## Condition Monitoring of Dust Collection System

- 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

# SNAP SIGNAL

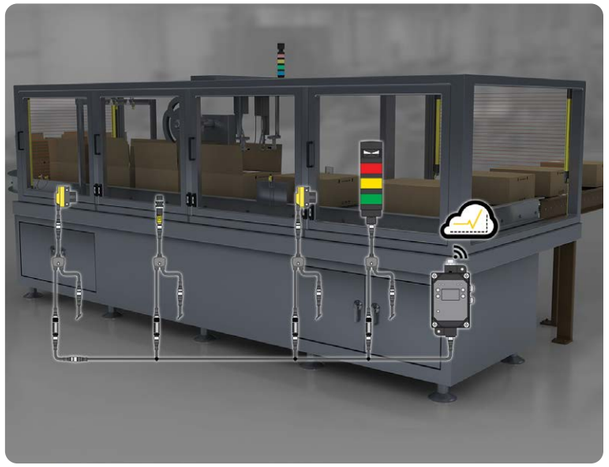


## Increase Productivity on an Injection Molding Machine

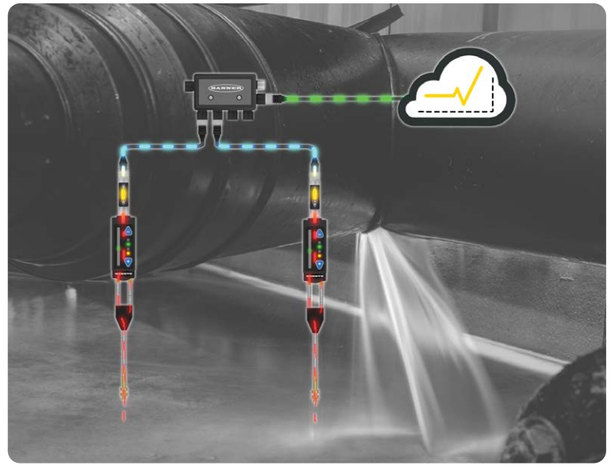
- Manage your process better and improve productivity and quality
- Snap Signal products interface with existing level sensors and temperature/humidity probes
- To monitor existing sensors and lights, you can add a tee or splitter cable to harvest discrete or analog signals that are already installed 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

## 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







## 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

## 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



# Smarter Automation. Better Solutions.™

Banner Engineering designs and manufactures industrial automation products including sensors and measurement devices; lighting, indicators, and displays; connectivity technology; condition monitoring solutions; machine safety products; industrial wireless systems; remote I/O; plus barcode scanners and machine vision. By listening to customers and engineering solutions that remove production constraints so they can achieve operational goals, Banner is an integral part of making many of the things we use every day, from food and medicine to cars and electronics. In fact, 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 worldwide 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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