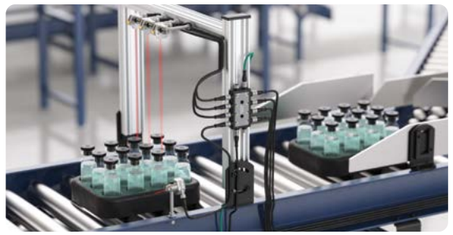
Remote I/O

BANNER®

more sensors, more solutions

Remote I/O Solutions from Banner

Remote I/O Blocks from Banner help machine builders optimize control system design, performance, and space efficiency with their compact form-factors, multi-protocol support, on-board programmability, and customization capability. Additionally, these products offer what you would expect from remote I/O blocks such as reduced wiring and costs associated with installation, integration, and diagnostics.

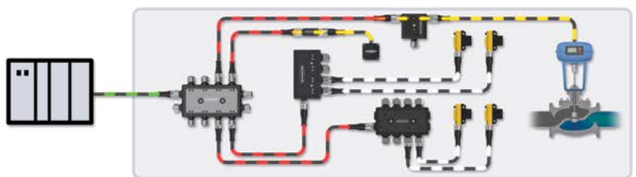


Reduce Wiring and Simplify Installation

Typically, the primary objective of machine builders using Remote I/O is to reduce wiring between field devices and the PLC located in the control panel. The graphics below illustrate the evolution of I/O management, from direct wired I/O to the most efficient IO-Link and Modbus I/O networks.

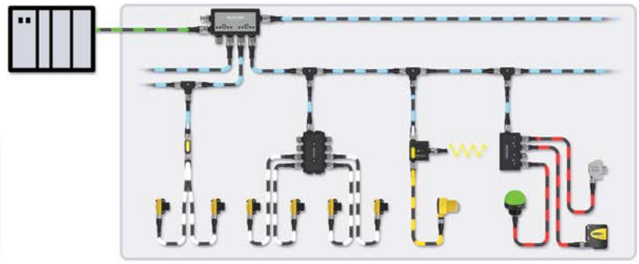
Direct Wired I/O

IO-Link Network

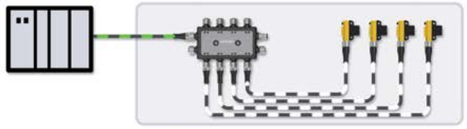


Passive (Passthrough) Junction Blocks

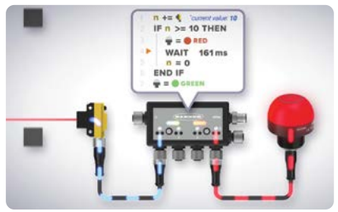
Modbus Network



Network I/O Blocks



Advanced Metrics and Simplified Programming



Optimize Control System Design through Customization

Versatile Housing and I/O Options

Multi-Protocol Ethernet Blocks

DXMR90 Industrial Controller

DXMR90 controllers are a central component of a Remote I/O system for device monitoring, An internal processor receives signals from sensors and other connected devices through four dedicated Modbus or IO-Link ports. The DXMR90 combines all signals into one unified stream of insightful data which can be exported via industrial Ethernet protocols.

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

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-Code Ethernet connectors for daisy chaining and communication to a higher-level control system	Eight female M12 connections for IO-Link	One male M12 for incoming power, one female M12 for daisy chaining power	DXMR110-8K

IO-Link Masters with Modbus RTU

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)

IO-Link Hubs

S15C Hub

- Easily converts signals like 4–20 mA analog to IO-Link without any setup required
- Allows previously incompatible devices to be connected to a smart system
- 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

R45C IO-Link to Analog Out Hub

- 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 Hub

- 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

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

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

IO-Link Hubs

R90C Discrete IO-Link Hub

The R90C IO-Link Hubs 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, 1 output | **K** = IO-Link | **Q** = M12 integral quick disconnect

R95C Discrete IO-Link Hub

The R95C IO-Link Hubs 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	–	8B21	–	K	Q

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

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

Modbus RTU I/O Blocks

S15C Converter

- Easily converts signals like discrete, analog, and more to Modbus, which makes it easy to monitor and send data to the cloud
- Allows previously incompatible devices to be connected to a smart system
- Rugged over-molded design meets IP65, IP67, and IP68

S15C	–	I	–	MQ

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

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

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 | **Q** = M12 integral quick disconnect
UU–UU = Analog 1 voltage in/out, analog 2 voltage in/out

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, 1 output | **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

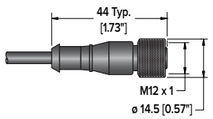
Housing	Function		Converter		Control	Connector
R95	C	–	8UI	–	M	Q

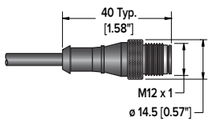
C = Converter | **8UI** = 8-port, voltage/current analog input | **M** = Modbus | **Q** = M12 integral quick disconnect

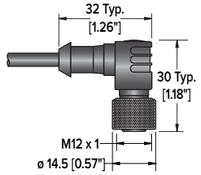
Cable: PVC jacket, PUR (polyurethane) connector body, nickel-plated brass coupling nut

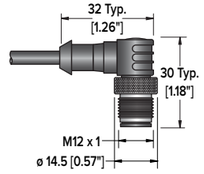
Conductors: 22 AWG or 24 AWG (open shield only) high-flex stranded, gold-plated contacts

Temperature: -40° to +90° C

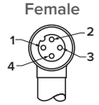


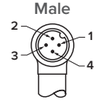


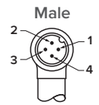




4-Pin M12 Cordsets (Voltage: 250 V dc/ac, Current: 4 A)

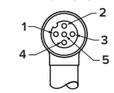
	Length	Straight	Right-Angle	Pinout	
4-Pin Female QD to Flying Leads	1 m	BC-M12F4-22-1	BC-M12F4A-22-1	Female 	**1** = Brown 2 = White **3** = Blue 4 = Black
	2 m	BC-M12F4-22-2	BC-M12F4A-22-2		
	5 m	BC-M12F4-22-5	BC-M12F4A-22-5		
	8 m	BC-M12F4-22-8	BC-M12F4A-22-8		
	10 m	BC-M12F4-22-10	BC-M12F4A-22-10		
	15 m	BC-M12F4-22-15	BC-M12F4A-22-15	22 AWG	Cable ø – 5.2 mm

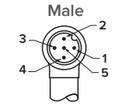
4-Pin Male QD to Flying Leads	1 m	BC-M12M4-22-1	—	Male 	**1** = Brown 2 = White **3** = Blue 4 = Black
	2 m	BC-M12M4-22-2	—		
	5 m	BC-M12M4-22-5	—		
	8 m	BC-M12M4-22-8	—		
	10 m	BC-M12M4-22-10	—	22 AWG	Cable ø – 5.2 mm

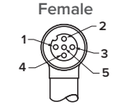
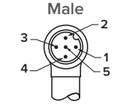
	Length	Straight/Straight (female/male)	Straight/Right-Angle (female/male)	Pinout	
4-Pin Double-Ended	0.3 m	BC-M12F4-M12M4-22-0.3	BC-M12F4-M12M4A-22-0.3	Female 	**1** = Brown 2 = White **3** = Blue 4 = Black
	0.5 m	BC-M12F4-M12M4-22-0.5	—		
	1 m	BC-M12F4-M12M4-22-1	BC-M12F4-M12M4A-22-1		
	2 m	BC-M12F4-M12M4-22-2	BC-M12F4-M12M4A-22-2		
	3 m	BC-M12F4-M12M4-22-3	—		
	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	Male 	
	15 m	BC-M12F4-M12M4-22-15	BC-M12F4-M12M4A-22-15	22 AWG	Cable ø – 5.2 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)

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

	Length	Straight/Straight (female/male)	Straight/Right-Angle	Pinout	
5-Pin Double-Ended	1 m	BC-M12F5-M12M5-22-1	—	Female 	**1** = Brown **2** = White **3** = Blue 4 = Black 5 = Gray
	2 m	BC-M12F5-M12M5-22-2	—		
	5 m	BC-M12F5-M12M5-22-5	—	Male 	
	8 m	BC-M12F5-M12M5-22-8	—		
	10 m	BC-M12F5-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.

M12 Coiled Cordsets

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

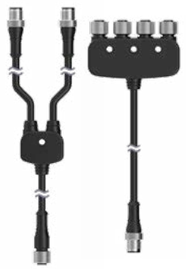
4-Pin Coiled Double-Ended Cordsets	0.8 to 1.7 m	MQDEC-401.7M-PUR-C	Female 	**1** = Brown **2** = White **3** = Blue **4** = Black
	1.0 to 2.6 m	MQDEC-403.3M-PUR-C	Male 	
			22 AWG	Cable ø – 5.2 mm

Connectivity

M12 Splitters and Tees

	Models	Cable Lengths		Pinout
		Branches (Female)	**Trunk** (Male)	
4-Pin	**CSB-M1240M1240**	No Branch	No Trunk	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black
	CSB-M1240M1241	2 x 0.3 m	No Trunk	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black
	CSB-M1241M1241	2 x 0.3 m	0.3 m	
	CSB-M1243M1243	2 x 1 m	1 m	
	CSB-M1243M1246	2 x 2 m	1 m	
	CSB-M1248M1241	2 x 0.3 m	2.4 m	
	CSB-M12415M1241	2 x 0.3 m	4.6 m	
	CSB-UNT425M1241	2 x 0.3 m	7.6 m Unterminated	**22 AWG** — **Cable ø – 6.0 mm**

	Models	Cable Lengths		Wiring Diagrams
		Branches (Female)	**Trunk** (Male)	
4-Pin	**S15YB-M124-M124-0.2M**	2 x 0.2 m	No Trunk	Trunk (male) 1–4 → Branch 1 (female) 1–4, Branch 2 (female) 1–4
	S15YA4-M124-M124-0.2M			Trunk (male) 1–4 → Branch 1 (female) 1–4, Branch 2 (female) 1–4
	S15YA24-M124-M124-0.2M			Trunk (male) 1–4 → Branch 1 (female) 1–4, Branch 2 (female) 1–4



	Models	Cable Lengths		Pinout
		Branches	**Trunk**	
5-Pin	**CSB-M1251FM1251M**	2 x 0.3 m (Male)	0.3 m (Female)	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray
	CSB4-M1251M1250	4 x No Branch (Female)	0.3 m (Male)	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray
				22 AWG — **Cable ø – 5.6 mm**

	Models	Cable Lengths		Pinout
		Branches	**Trunk**	
5-Pin	**CSB-M1250M1250-T**	No Branch	No Trunk	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray
	CSB-M1250M1250-A	No Branch	No Trunk	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray

M12 Molded Junction Blocks

	Models	Cable Lengths		Pinout
		Branches (Female)	**Trunk** (Male)	
5-Pin	R50-4M125-M125Q-P	4 x No Branch	No Trunk	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray
	R95-8M125-M125Q-P	8 x No Branch	No Trunk	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray

M12 Field Wireables

	Male/Female	Straight	Pinout
4-Pin M12 Field Wireable	Male	**FIC-M12M4**	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black
	Female	**FIC-M12F4**	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black

	Male/Female	Straight	Pinout
5-Pin M12 Field Wireable	Male	**FIC-M12M5**	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray
	Female	**FIC-M12F5**	Female: 1 = Brown, 2 = White, 3 = Blue, 4 = Black, 5 = Gray

Ethernet Cordsets

	Length	Straight	Pinout
4-Pin Male M12 to RJ45	2 m	**STP-M12D-406**	Male: 1 = Brown, 2 = White, 3 = Blue, 4 = Black
	5 m	**STP-M12D-415**	**2 x 24 Pair AWG** — **Cable ø – 6.2 mm UTP Stranded**
	9 m	**STP-M12D-430**	

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

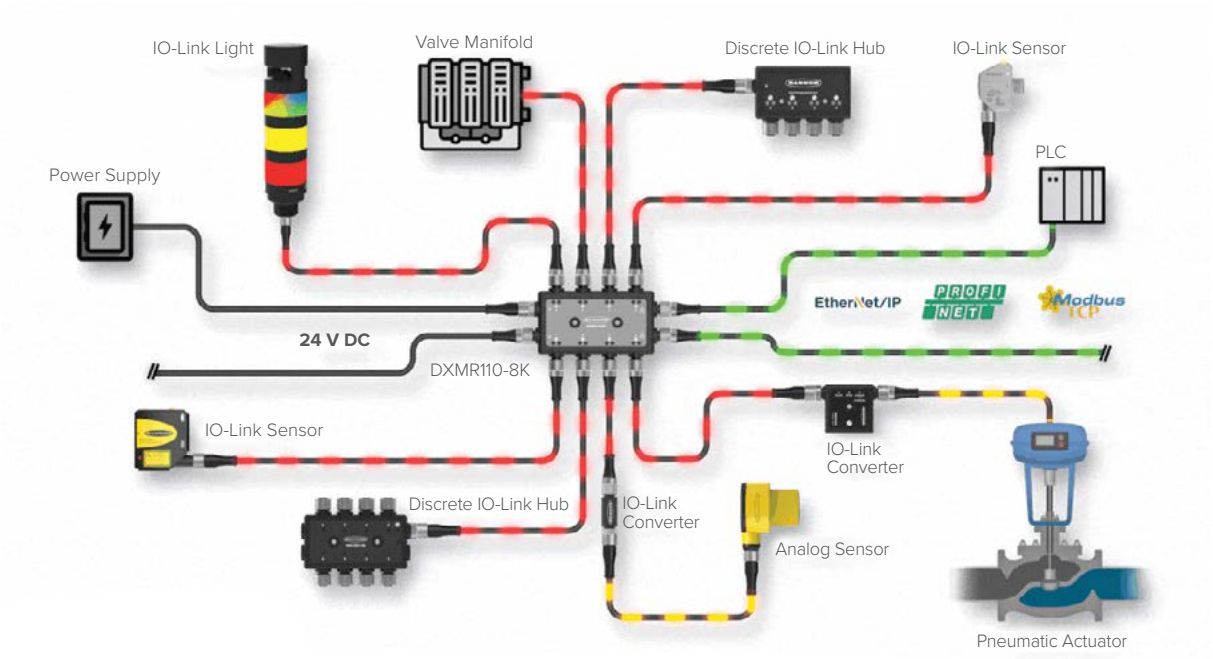
LMBS15MAG
Attaches to S15C (magnetic)

LMBS15SP
Attaches to S15C

Streamline Your IO-Link Network

The compact DXMR110-8K allows for the connection and control of up to eight IO-Link devices such as sensors, indicator lights, IO-Link hubs, without the need for multiple traditionally expensive input cards. The DXMR110-8K can communicate with higher-level control systems via EtherNet/IP, Modbus/TCP, and PROFINET. The DXMR110-8K also has the ability to push IO-Link data to cloud platforms.

DXMR110-8K System Diagram

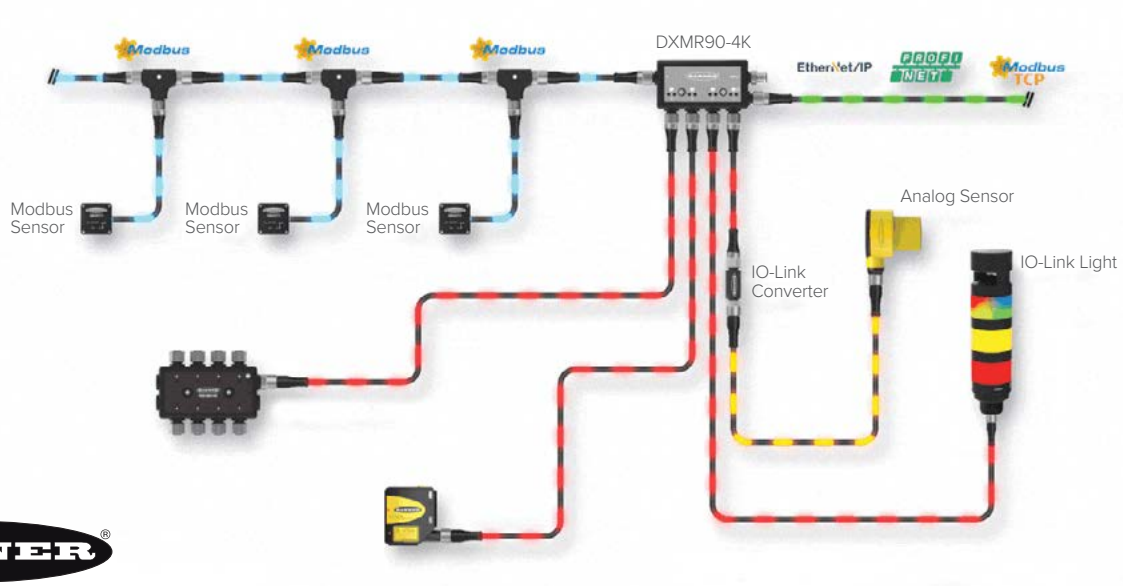


No IO-Link Device? No problem. Our expansive line of converters can adapt most industrial devices to IO-Link quickly, giving you the flexibility to build the system you need.

Connect More Devices with Ease

The DXMR90-4K allows for the connection and control of up to four IO-Link devices, replacing multiple traditionally expensive input cards. The DXMR90-4K can communicate with higher-level control systems via EtherNet/IP, Modbus/TCP, and PROFINET. This IO-Link master also has an additional serial port that allows for the connection of more devices for maximum flexibility.

DXMR90-4K System Diagram



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