IO-Link®
Solutions

BANNER®

more sensors, more solutions

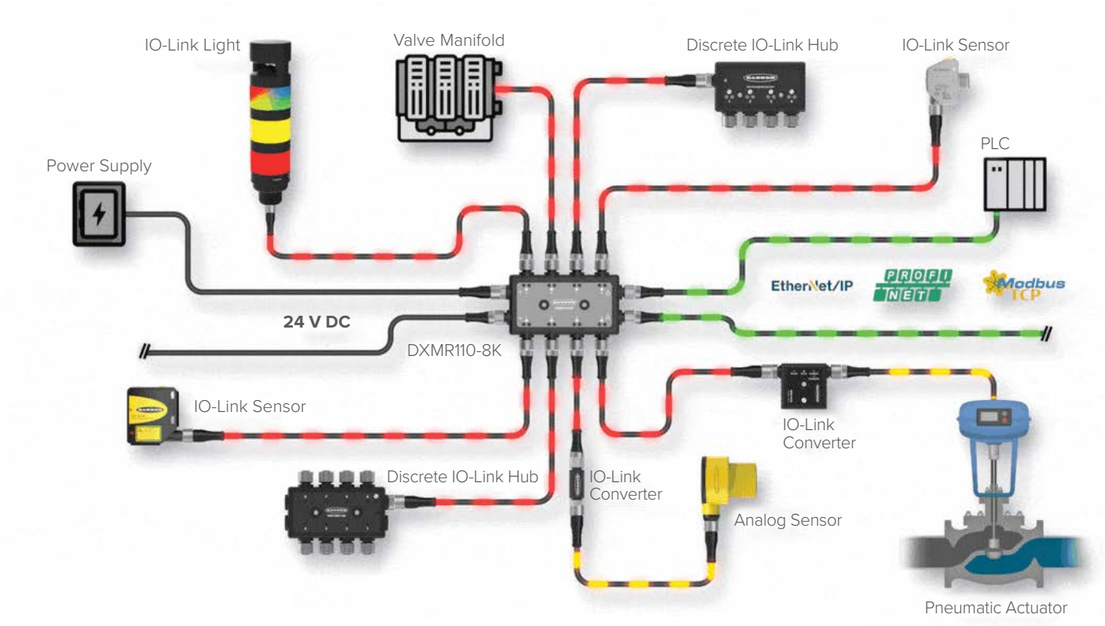
ADVANTAGES OF IO-Link®

1. Allows seamless and simple device replacement
2. Standardizes and reduces wiring
3. Can replace analog
4. Connects to non-IO-Link devices
5. Increases data availability
6. Allows device configurations to be read and changed remotely
7. Permits advanced diagnostics
8. Enables IIoT connectivity

Learn More About the Advantages of IO-Link

BANNER® ADVANTAGE

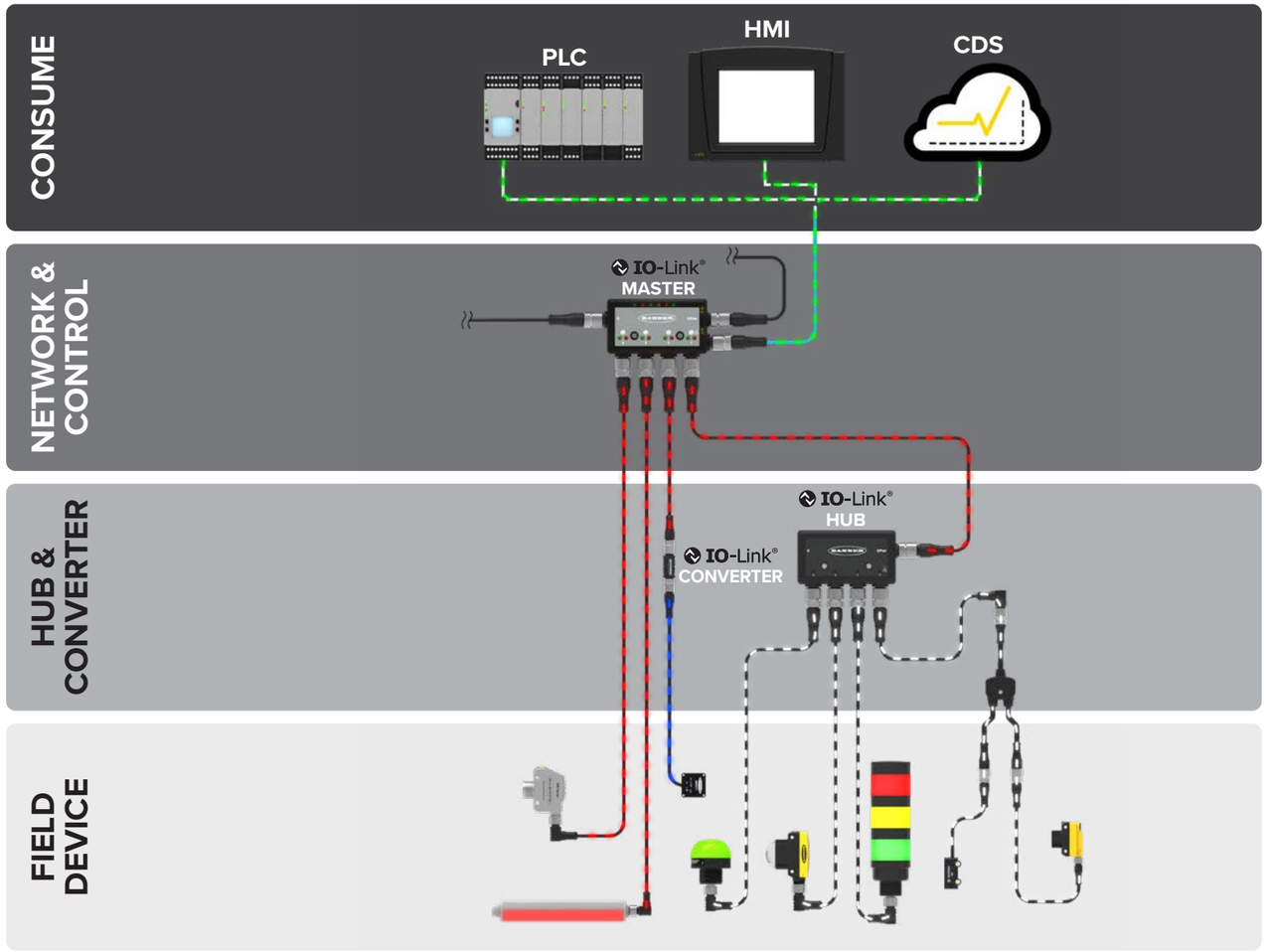
DXMR110-8K System Diagram



- Banner offers a wide selection of IO-Link sensors, lights, converters, hubs, and IO-Link masters
- Converters offer scalability for the future
- Online configuration software and AOIs make IO-Link device connection easier
- Rugged IO-Link masters are the most compact in the industry
- Advanced programmability allows engineers to solve unique application challenges

Introduction to IO-Link

In recent years, IO-Link systems have become widespread within industrial automation. IO-Link is an open-standard serial communication protocol that allows for the bi-directional exchange of data from sensors and devices that are connected to a master. The IO-Link master can transmit this data over various networks, fieldbuses, or backplane buses, making the data accessible for immediate action or long-term analysis via an industrial information system, like a PLC, HMI, and others. Banner IO-Link products reduce wiring, increase data availability, enable remote configuration and monitoring, simplify device replacement, and provide extended diagnostics. Banner Engineering offers a variety of IO-Link products for industrial applications including sensors, lighting products, converters, hubs, and IO-Link masters.



Field Devices

Connectivity

IO-Link Hubs & Converters

IO-Link Masters

Consume Data

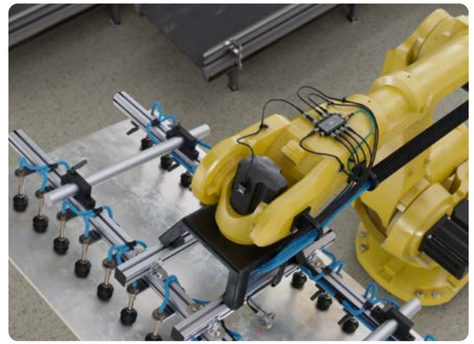
IO-Link® FIELD DEVICES

Capture Actionable Data

Banner is a leader in IO-Link solutions for industrial applications. We offer sensing and lighting products specifically designed to excel in IO-Link applications. Our IO-Link photoelectric sensors provide precise object detection for enhanced automation and control. Our fiber optic amplifiers offer seamless data exchange with exceptional accuracy. Our laser measurement sensors enable precise distance and position measurements in IO-Link applications for efficient and accurate process monitoring. With robust detection capabilities, our radar sensors ensure reliable, real-time object tracking in IO-Link networks, even in challenging environments. To enhance performance of IO-Link systems, Banner lighting products offer brilliant illumination, improving visibility and enabling better decision-making. Versatile designs allow for easy mounting and integration, simplifying installation and reducing downtime. And all Banner products are built to withstand harsh industrial environments, making them ideal for IO-Link applications.

Optimize Robotic End-of-Arm Tooling Applications

- Banner's compact and light weight IO-Link masters can help optimize machine designs and performance in robotic end-of-arm tooling applications
- Unique form factor with M12 ports on the sides allowing better cable routing and less cable bend radius issues

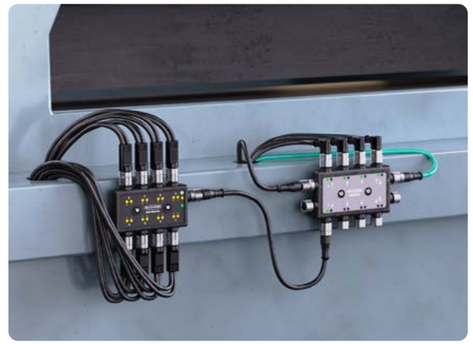


Object Verification on Bottling Line

- Banner's IO-Link Q4X laser distance sensor offers dual discrete outputs. IO-Link allows for remote device configuration, sensor backup and easier diagnostics.
- With the capability to detect height changes as small as 0.5 mm and distances up to 300 mm, the Q4X can solve distance-based applications regardless of target surface reflectivity, including black foam on black plastic, black rubber in front of metal, multicolor packaging and targets of all colors

Reduce Machine Costs, Simplify System Designs, and Reduce Installation Time

- Combinations of Banner IO-Link masters and IO-Link hubs allow the processing of up to 128 I/O signals
- Standardizing on IO-Link hubs enables users to reduce wiring to the PLC and standardize on M12 cables, which are cost effective and easy to install



Learn more at snapsignal.bannerengineering.com

IO-Link® FIELD DEVICES

QS18 All-Purpose Compact Sensors

- Includes rugged, sealed housing with protected circuitry
- Easily fits (or retrofits) almost any mounting situation
- Has less than 1 millisecond output response for excellent sensing repeatability
- Capable of ranges up to 20 m
- Offers mechanical and electronic adjustable field background suppression

Series	Output State	Output	Input	Sensing Mode	Connection
QS18	**V**	**K**	**6**	**LP**	**Q8**
QS18 = Standard **QS18E** = Expert	**V** = Complementary output **A** = Light operate **R** = Dark operate	**K** = IO-Link	**6** = 10-30 V DC	**E** = Emitter **R** = Receiver **LP** = Polarized retroreflective **D** = Diffuse **AF###** = Adjustable-field with range **XLPC** = Coaxial polarized retroreflective with clear object detection	**Blank** = 2 m cable **Q** = 150 mm cable with M8 QD **Q5** = 150 mm cable with M12 QD **Q7** = Integral M8 QD **Q8** = Integral M12 QD QD models require mating cordset

Q20 Compact Sealed Sensors

- Compact, rugged, sealed, overmolded plastic housing
- Standard 3 mm threaded mounting holes on 25.4 mm (1 in.) spacing

Series	Output	Sensing Mode	Connection
Q20	**K**	**AF200**	**Q**
	K = PNP with IO-Link	**AF200** = Adjustable-field with 200 mm range **AF400** = Adjustable-field with 400 mm range	**Q** = 150 mm cable with M8 QD **Q5** = 150 mm cable with M12 QD **Q7** = Integral M8 QD QD models require mating cordset

Q2X Laser Measurement Sensors

- Measure farther with the industry's longest sensing range for a sensor in a compact housing
- Sense the most challenging targets like dark or shiny poly bags with a powerful infrared laser with best-in-class excess gain
- Employ sensors in many applications by consolidating to one sensor model with an array of sensing modes, including background suppression, window mode, and dual model

Family	Housing Style	Mode	Range	Beam Color	Connection
Q2X	**K**	**LAF**	**3**	**IR**	**Q5**
	K = IO-Link with discrete	**LAF** = Laser adjustable-field	**3** = 3 m **2** = 2 m	**IR** = Infrared	**Q** = 150 mm M8 pigtail QD **Q5** = 150 mm M12 pigtail QD QD models require mating cordset

Q76E Wide Beam Retroreflective Sensors

- Visible red beam for simple alignment and bright LEDs for visual indication
- Up to four meter range for mounting flexibility
- Two sensitivity levels for detection of challenging targets such as shrink wrapped pallets, small objects and film or perforated packaging
- Easy set-up, adjustment and LO/DO selectable via single push button

Range	Input	Output	Cable	Models
0.4 mm to 4.0 m	10 to 30 V DC	1 PNP/NPN light operate with IO-Link; 1 PNP dark operate	200 mm PUR cable with a 4-pin M12 male quick disconnect	**Q76E-KP-ZLVC-Q5**

DF-G3 Long-Range Fiber Optic Amplifiers

- Easy-to-use DIN-rail-mountable fiber optic sensor
- Compact housing with dual digital displays and bright output LEDs for easy programming and status monitoring
- Available in high power models, ultra-fast models, and specialty models
- Compatible with a wide variety of fiber optic cables to fit into any application

Family	LED Color*			Discrete Output Type	Output Configuration	Connection
DF-G3				**K**	**D**	**2M**
DF-G1 **DF-G2** **DF-G3**	**Blank** = Visible red LED **B** = Blue LED† **G** = Green LED†	**W** = White LED† **IR** = Infrared LED **LIR** = Long infrared LED**		**K** = IO-Link	**S** = Complementary **D** = Dual discrete*	**2M** = 2m cable **Q3** = 150 mm cable with M8 QD **Q5** = 150 mm cable with M12 QD **Q7** = Integral 4 pin M8 QD models require mating cordset

*Not available with DF-G1 models
**Not available with DF-G2 models
†Not available with DF-G3 models

LTF Long-Range Laser Measurement Sensors

- Best in class combination of range, repeatability and accuracy enables reliable target detection and precise distance measurement
- Durable IP67 metal housing with 100G shock rating
- High ambient light immunity and stable performance across temperatures provides reliable performance in challenging environments

Series	Range	Output	Laser Class	Sensing Mode	Connector
LTF	**12**	**K**	**C2**	**LD**	**Q**
	12 = 12 m **12** = 24 m	**K** = Dual discrete (NPN/PNP configurable) with IO-Link	**C2** = Class 2	**LD** = Laser diffuse	**Q** = Rotatable M12 QD QD models require mating cordset

IO-Link® FIELD DEVICES

T30R Radar Sensors

- Reliable detection of high-dielectric targets (like metal or large amounts of water) and lower-dielectric materials (such as wood, rock, or organic material)
- Compact, IP67-rated housing for use in challenging environments (T30RW model features IP69K-rated housing)
- Crosstalk immunity, allowing for multiple sensors to be mounted in close proximity

Series	Housing		Beam Angle		Bandwidth		Output		Connector
T30R		–	**1515**	–		–	**KD**		**Q**
	Blank = Standard **W** = IP69K*		**1515** = 15° x 15° beam **4545** = 45° x 45° beam		**Blank** = Standard **C** = Near range* **L** = Long range*		**KD** = Dual discrete with IO-Link **KI** = Discrete with IO-Link and 4–20 mA analog **KU** = Discrete with IO-Link and 0–10 V analog		**Q** = Integral M12 QD **QP** = 150 mm M12 QD pigtail QD models require mating cordset

*Only available in 1515 beam angles

Q4X Rugged Laser Measurement Sensors

- Best price with performance short-range sensing solution
- Most compact, rugged IP69, Ecolab-certified, stainless-steel housing
- Dual mode for contrast and clear object detection without a reflector
- Flush mount or barrel mount housing options for versatility in mounting

Threaded-Barrel Q4XT

Series	Housing Style	Output	Mode	Range	Connector
Q4X	**T**	**K**	**LAF**	**300**	– **Q8**
	T = 18 mm threaded barrel	**K** = Dual discrete with IO-Link	**LAF** = Laser adjustable-field	**600** = 25–600 mm **300** = 25–300 mm **100** = 25–100 mm	**Q8** = Integral QD

Flush-Mount Q4XF

Series	Housing Style	Output	Mode	Range	Connector
Q4X	**F**	**K**	**LAF**	**310**	– **Q8**
	F = Flush face	**K** = Dual discrete with IO-Link	**LAF** = Laser adjustable-field	**610** = 35–610 mm **310** = 35–310 mm **110** = 35–110 mm	**Q8** = Integral QD

Q5X Laser Measurement Sensor

- Best price with performance mid-range sensing solution
- Highest excess gain for detecting the darkest targets at extreme angles
- Dual mode for contrast and clear object detection without a reflector
- Jam detection model alerts operators to production line jams, reducing or preventing downtime

Series	Output	Mode	Range (mm)		Connector	Options
Q5X	**K**	**LAF**	**2000**	–	**Q8**	
	K = Configurable dual discrete with IO-Link on all models **KU** = 0–10 V with push/pull discrete output or IO-Link **KI** = 4–20 mA with push/pull discrete output or IO-Link	**LAF** = Laser adjustable field background suppression	**2000** **3000*** **5000** **10000**		**Q8** = Integral swivel M12 connector *KU and KI models available in 3000 mm range only **Jam model only available with 2000 mm	**-Jam** = Jam model** **Blank** = Standard model

LE Precision Mid-Range Laser Measurement Sensors

- Highest-precision sensor for mid-range applications from 100 mm to 1 m
- Low-temperature effect for measurement stability in any environment
- Class 1 and Class 2 laser options

Series	Range	Output	Laser Class	Connector
LE	**550**	**K**		**Q**
	550 =100–1000 mm **250** =100–400 mm	**K** = IO-Link and (1) PNP discrete NOTE: Discrete NPN/PNP is user configurable	**Blank** = Class 2 **C1** = Class 1	**Q** = Rotatable M12 QD QD models require mating cordset

LM Compact Laser Measurement Sensors

- Short-range, high precision, even on shiny metals
- Smallest spot size for more measurements and fewer color-transition errors
- High excess gain for detecting the darkest targets
- Least affected by temperature changes, for measurement stability in any environment
- Small stainless-steel housing for longevity and durability

Series	Range (mm)	Output	Connector
LM	**150**	**KI**	**QP**
	150 = 50–150 **80** = 40–80	**KI** = Discrete with IO-Link and 4–20 mA analog **KU** = Discrete with IO-Link and 0–10 V analog	**QP** = PVC 150 mm cable with M12 QD

IO-Link® FIELD DEVICES

QCM50 High-Performance Color Sensors

- Reliable color detection across the entire range of the sensor
- Up to twelve colors can be detected with one sensor, reducing inventory costs and enabling faster changeover
- Anti-glare model is available to reliably detect reflective targets
- Intuitive configuration with integrated digital display and on-board buttons

Series	IO-Link	Number of Outputs	Sensing Range		Connector		Number of Pins
QCM50	**K**	**3**	**D25**		**Q8**		**5**
	K = IO-Link	**1**	**D25** = 18 to 32 mm		**Q8** = Integral M12		**4**
		3	**D40** = 18 to 40 mm				**5**
		5	**D60** = 20 to 150 mm				**8**

EZ-ARRAY Measuring Light Curtains

- Applications include edge and center-guiding, loop tension control, hole sizing, parts counting and on-the-fly product sizing and profiling
- Closely spaced infrared beams provide 5 mm resolution or 2.5 mm single edge resolution
- Controller functionality is built into the receiver, so basic setup requires no controller, software, or PC
- Configuration options include 14 measurement modes, three scanning methods, two analog and two discrete outputs, and a serial output

Array Length	Total Beams	Receiver Discrete Output	Receiver Analog Output	Emitter Models	Receiver Models
150 mm	30	PNP	Voltage (0-10 V)	**EA5E150Q**	**EA5R150XK2Q**
300 mm	60			**EA5E300Q**	**EA5R300XK2Q**
450 mm	90			**EA5E450Q**	**EA5R450XK2Q**
600 mm	120			**EA5E600Q**	**EA5R600XK2Q**
750 mm	150			**EA5E750Q**	**EA5R750XK2Q**
900 mm	180			**EA5E900Q**	**EA5R900XK2Q**
1050 mm	210			**EA5E1050Q**	**EA5R1050XK2Q**
1200 mm	240			**EA5E1200Q**	**EA5R1200XK2Q**
1500 mm	300			**EA5E1500Q**	**EA5R1500XK2Q**
1800 mm	360			**EA5E1800Q**	**EA5R1800XK2Q**
2100 mm	420			**EA5E2100Q**	**EA5R2100XK2Q**
2400 mm	480			**EA5E2400Q**	**EA5R2400XK2Q**

WLS15 Pro LED Strip Lights

- Provides operator guidance for assembly and manufacturing processes
- Configurable, dynamic indication in a slim, sealed LED strip light
- Nineteen color options plus animations and direct sensor interface give limitless options to convey status, resulting in clear communication

Series	Style	Cascadable	Color	Length (mm)	Window	Construction	Control	Connector
WLS15	**P**	**X**	**RGB**	**0360**	**D**	**S**	**K**	**QP**
	P = Pro	**X** = Non-cascadable	**RGB** = RGB multicolor	**0220** **0640** **0360** **0920** **0500** **1200**	**D** = Diffuse	**S** = Sealed (IP66, IP67)	**K** = IO-Link	**QP** = 150 mm cable with M12 QD

WLS27 Pro LED Strip Lights

- Programmable models with RGBW LEDs for use in indication, illumination, and inspection applications
- IO-Link helps reduce costs, increase process efficiency, and improves machine availability

Series	Style	Cascadable	Color	Lighted Length (mm)	Window	Construction	Control	Connector
WLS27	**P**	**X**	**RGBW**	**285**	**D**	**S**	**K**	**Q**
	P = Pro	**X** = Non-cascadable	**RGBW** = RGBW multicolor	**145** **570** **285** **850** **430** **1130**	**D** = Diffuse plastic **H** = Heavy diffuse plastic	**S** = Sealed	**K** = IO-Link	**Q** = M12 integral QD QD models require mating cordset

WLS28 Pro LED Strip Lights

- High quality illumination and indication from RGBW LEDs
- Six white color temperatures for comfort and compatibility
- Thirteen color options for varied indication and inspection uses
- IO-Link gives full access to individual LED control, color, flashing, intensity, and animation settings, as well as advanced operating modes for displaying distance, count, time, and position

Series	Style	Cascadable	LED Color	Lighted Length (mm)	Window	Construction	Control	Connector
WLS28	**P**	**X**	**RGBW**	**285**		**X**	**K**	**Q**
	P = Pro	**X** = Non-cascadable	**RGBW** = RGBW multicolor	**145** **570** **285** **850** **430** **1130**	**Blank** = Clear plastic **D** = Diffuse plastic **L25** = 25° lensed window **L25D** = 25° diffuse lensed window	**X** = IP50	**K** = IO-Link	**Q** = M12 integral QD QD models require mating cordset

IO-Link® FIELD DEVICES

TL50 Pro Tower Lights

- Up to ten segments for advanced status signaling and high-resolution process details
- Advanced animations like level, timer, counter, and action mode provide dynamic visual response
- Parameter and process data options on IO-Link models enable fast and complete control of functionality

Housing	Number of Segments	Audible Alarm	Control	Housing Color	Connection
TL50	**3**	**A**	**K**		**Q**
TL50 = Standard **TL50C** = Compact **TL50BL** = Beacon **TL50PS** = Pro Select	**1*** **6*** **2*** **7*** **3** **8*** **4*** **9*** **5*** **10***	**Blank** = None **A** = Audible **ALS** = Sealed audible continuous tone* **AOS** = Omni-directional sealed audible continuous tone* **AOSI** = Omni-directional sealed audible continuous tone with intensity adjust*	**K** = IO-Link	**Blank** = Black **C** = Gray*	**Q** = M12 integral QD **QP** = 150 mm cable with M12 QD*

QD models require mating cordset
*Not available with pro select models

TL70 Pro Tower Lights

- Pro series tower lights provide classic segment control as well as advanced status indication that adds nuance to the visual factory
- Allows users to configure color, flashing, rotation, and light intensity
- Models with IO-Link communication enable almost limitless capacity for custom indication

Preassembled Pro Models with IO-Link

Housing	Style	Number of Segments	Audible Alarm*	Control	Housing Color	Connection
TL70	**P**	**3**	**A**	**K**		**Q**
	P = Pro	**1** = 1 segment **2** = 2 segments **3** = 3 segments **4** = 4 segments **5** = 5 segments **6** = 6 segments	**Blank** = None **A** = Standard audible **AL** = Loud audible **AP** = Programmable audible	**K** = IO-Link	**Blank** = Black **C** = Gray	**Q** = 4-pin M12 integral QD **QP** = 4-pin 150 mm cable with M12 QD

QD models require mating cordset
*Not available with six-light models

CL50 Pro Column Lights

- Rugged, versatile, and easy-to-install multicolor indicators
- Bright, easy-to-see operator guidance and indication of equipment status
- Customized indication possibilities, including color, flash patterns, and light intensity
- Audible models available with sealed, omni-directional audible element

Series	Style	Audible Alarm	Control	Connection
CL50	**P**	**A**	**K**	**Q**
	P = Pro	**Blank** = None **A** = Omni-directional sealed audible	**K** = IO-Link	**Q** = 4-pin M12 integral QD

K30 Pro Indicators

- IO-Link models give full access to color, flashing, rotating, and dimming settings as well as advanced animations such as dynamic sequence mode and LED control
- Polycarbonate housing protects against impact and withstands high-pressure, high-temperature washdown to ensure reliable performance in challenging environments

Series	Style	Housing	Control	Connection
K30	**P**	**L**	**K**	**Q**
	P = Pro	**L** = Dome	**K** = IO-Link	**Q** = 4-pin M12 integral QD **QP** = 150 mm PVC cable with 4-pin M12 QD

QD models require mating cordset

K50 Pro Indicators

- Bright, uniform indicator light
- Fourteen color options including: green, red, yellow, blue, white, cyan, magenta
- IO-Link models give full access to color, flashing, rotating, and dimming settings as well as advanced animations such as dynamic sequence mode and LED control

Series	Material	Color & Input	Audible Alarm**	Connection
K50L2		**RGBK**	**A1**	**Q**
K50L2 = Dome **K50CL2** = Compact***	**Blank** = Standard **F** = FDA grade	**RGBK** = RGB muliticolor with IO-Link	**Blank** = No audible **A1** = Audible **AL1** = Loud audible **ALS** = Sealed audible	**Blank** = 2 m integral cable **Q** = M12 integral QD*** **QP** = 150 mm cable with M12 QD

**Audible models not available in FDA grade material or compact
***Compact and integral QD models not available in FDA grade material

QD models require mating cordset

K50 Pro Beacon Indicators

- Bright indicator with individually visible LEDs
- Intense levels of light output for areas with high ambient light, including outdoor environments
- IO-Link control allows access to full color, flashing, and dimming controls as well as advanced animations for millions of color possibilities

Series	Style	Housing	Control	Connection
K50	**P**	**BL**	**K**	**Q**
	P = Pro	**BL** = Beacon	**K** = IO-Link	**Q** = M12 integral QD

QD models require mating cordset

K50 Pro Touch with Display Indicators

- Four-digit, seven-segment LED display with two independent touch areas
- Clearly communicate status and receive feedback, improving throughput and productivity
- Ideal interface device for pick-to-light, condition monitoring, and general operator interaction in industrial environments

Series	Style	Activation Method	Housing	Display	Control	Connection
K50	**P**	**T**	**C**	**D4**	**K**	**Q**
	P = Pro	**T** = Touch	**C** = Compact	**D4** = 4-digit LED display	**K** = IO-Link	**Q** = 4-pin M12 integral QD **QP** = 150 mm cable with 4-pin M12 QD

QD models require mating cordset

IO-Link® FIELD DEVICES

K50 Optical Touch Button Indicators

- Rugged, cost-effective, and easy-to-install solutions for error-proofing and parts-verification applications
- Illuminated dome provides easy-to-see job light status
- Up to fourteen standard colors in one device
- IO-Link models enable color and animation customization, managed dynamically by the master, plus individual LED control
- Sequence mode can be used to indicate level, takt time, and more

Series	Style	Activation Method	Control	Connection
K50	**P**	**FF50**	**K**	**Q**
	P = Pro	**FF50** = 50 mm fixed field* **FF100** = 100 mm fixed field* **FF200** = 200 mm fixed field*	**K** = IO-Link	**Q** = 4-pin integral M12 QD **QP** = 150 mm PVC cable with 4-pin integral M12 QD QD models require mating cordset

*Cutoff distance will vary from specified range based on target and tolerances.

K90 Pro Indicators

- Large, bright, uniform indicator light
- Seven default colors in one device (green, red, yellow, blue, white, cyan, magenta)
- IO-Link models provide access to full color, flashing, and dimming controls as well as advanced animations for millions of color possibilities

Series	Style	Housing	Control	Connection
K90	**P**	**L**	**K**	**Q**
	P = Pro	**L** = Dome	**K** = IO-Link	**Q** = 5-pin M12 integral QD **QP** = 150 mm cable with M12 QD QD models require mating cordset

K30 Pro Touch Button Indicators

- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Up to fourteen colors in one device
- Devices are completely self-contained: No controller needed
- Ergonomically designed to eliminate hand, wrist, and arm stresses associated with repeated switch operation: No physical force required to operate

Series	Style	Activation Method	Control	Connection
K30	**P**	**T**	**K**	**QP**
	P = Pro	**T** = Touch	**K** = IO-Link	**Q** = 4-pin M12 integral QD **QP** = 150 mm PVC cable with 4-pin M12 QD QD models require mating cordset

K50 Pro Touch Indicators

- Bright LED indicators combined with touch-activated switching capabilities
- Advanced touch technology allows for high immunity to water while still working with gloves
- Up to fourteen color variations in one device
- Mechanical button models available for traditional, tactile feedback
- Programmable using Banner's IO-Link system for customization of colors and animation

Pro Touch Models with IO-Link or PICK-IQ

Series	Style	Activation Method	Housing	Control	Connection
K50	**P**	**T**	**C**	**K**	**Q**
	P = Pro	**T** = Touch **TF** = Touch, FDA grade **TV** = Touch, vibration feedback **TFV** = Touch, FDA grade, vibration feedback	**C** = Compact* **Blank** = Standard dome	**K** = IO-Link	**Q** = 4-pin M12 integral QD** **QP** = 150 mm cable with M12 QD** QD models require mating cordset

*Not available in FDA grade material or with vibration feedback
**Not available in FDA grade material

Pro Push Button Models with IO-Link

Series	Style	Activation Method	Control	Connection
K50	**P**	**PB**	**K**	**Q**
	P = Pro	**PB** = Push button	**K** = IO-Link	**Q** = 4-pin M12 integral QD QD models require mating cordset

K50 Pro Touch with Audible Indicators

- Integral audible alarm has fourteen tones with customization and intensity control
- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Integral audible can be used as standalone indicator or as an input to touch conditions
- Can be actuated with bare hands or gloves
- Compact models available for lower profile applications
- IO-Link models give full access to color, flashing, rotating, and dimming settings as well as advanced animations such as dynamic sequence mode and LED control

Series	Style	Activation Method	Housing	Control	Audible	Connection
K50	**P**	**T**	**C**	**K**	**A**	**QP**
	P = Pro	**T** = Touch	**C** = Compact **Blank** = Standard dome	**K** = IO-Link	**A** = Audible	**Q** = 4-pin M12 integral QD **QP** = 150 mm PVC cable with 4-pin M12 QD QD models require mating cordset

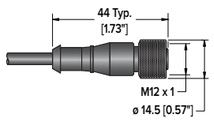
Connect Your Devices

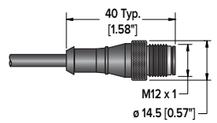
IO-Link products typically incorporate M12 connectors, which are the industry standard for joining devices. IO-Link allows you to standardize on unshielded M12 connectivity which is readily available and cost effective. Any device that does not have an M12 connector can be easily converted using field-wireable M12 connectors.

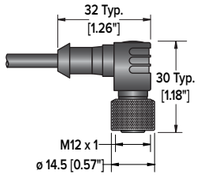
Cable: PVC jacket, PUR (polyurethane) connector body, nickel-plated brass coupling nut

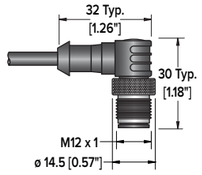
Conductors: 22 AWG or 24 AWG (open shield only) high-flex stranded, gold-plated contacts

Temperature: -40° to +90° C

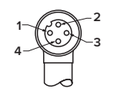
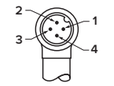


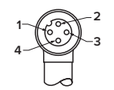
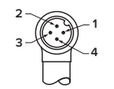






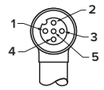
4-Pin M12 Cordsets (Voltage: 250 V DC/AC, Current: 4 A)

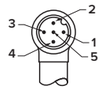
	Length	Straight	Right-Angle	Pinout	
4-Pin Female QD to Flying Leads	1 m	MQDC-403	—	Female 	**1** = Brown **2** = White **3** = Blue **4** = Black
	2 m	MQDC-406	MQDC-406RA		
	3 m	MQDC-410	—		
	5 m	MQDC-415	MQDC-415RA		
	9 m	MQDC-430	MQDC-430RA		
	15 m	MQDC-450	MQDC-450RA		
	18 m	MQDC-460	MQDC-460RA		
	21 m	MQDC-470	MQDC-470RA		
	30 m	MQDC-4100	MQDC-4100RA	22 AWG	Cable ø – 5.2 mm
4-Pin Male QD to Flying Leads	2 m	MQDMC-406	MQDMC-406RA	Male 	**1** = Brown **2** = White **3** = Blue **4** = Black
	5 m	MQDMC-415	MQDMC-415RA		
	9 m	MQDMC-430	MQDMC-430RA	22 AWG	Cable ø – 5.2 mm

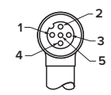
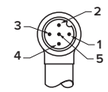
	Length	Straight/Straight (female/male)	Straight/Right-Angle (female/male)	Pinout	
4-Pin Double-Ended	0.3 m	MQDEC-401SS	MQDEC-401SR	Female 	**1** = Brown **2** = White **3** = Blue **4** = Black
	0.6 m	MQDEC-402SS	—		
	0.9 m	MQDEC-403SS	MQDEC-403SR		
	1.8 m	MQDEC-406SS	MQDEC-406SR		
	3.0 m	MQDEC-410SS	—		
	3.6 m	MQDEC-412SS	MQDEC-412SR		
	4.5 m	MQDEC-415SS	MQDEC-415SR		
	6.1 m	MQDEC-420SS	MQDEC-420SR		
	9.2 m	MQDEC-430SS	MQDEC-430SR		
	15.2 m	MQDEC-450SS	MQDEC-450SR	Male 	
				22 AWG	Cable ø – 5.2 mm

Note: Not all models are shown. Please contact Banner for other available double-ended styles.

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

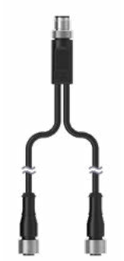
	Length	Straight	Right-Angle	Pinout
5-Pin Female QD to Flying Leads	0.9 m	MQDC1-503	—	Female  **1** = Brown **2** = White **3** = Blue **4** = Black **5** = Gray
	2 m	MQDC1-506	MQDC1-506RA	
	5 m	MQDC1-515	MQDC1-515RA	
	9 m	MQDC1-530	MQDC1-530RA	
	19 m	MQDC1-560	—	
	30 m	MQDC1-5100	—	22 AWG Cable ø – 5.6 mm

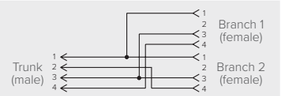
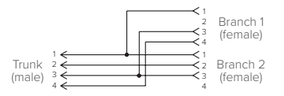
	Length	Straight	Right-Angle	Pinout
5-Pin Male QD to Flying Leads	2 m	MQDMC-506	MQDMC-506RA	Male  **1** = Brown **2** = White **3** = Blue **4** = Black **5** = Gray
	5 m	MQDMC-515	MQDMC-515RA	
	9 m	MQDMC-530	MQDMC-530RA	22 AWG Cable ø – 5.6 mm

	Length	Straight/Straight (female/male)	Straight/Right-Angle	Pinout
5-Pin Double-Ended	0.3 m	MQDEC-501SS	—	Female  **1** = Brown **2** = White **3** = Blue **4** = Black **5** = Gray
	1 m	MQDEC-503SS	—	
	2 m	MQDEC-506SS	—	Male 
	5 m	MQDEC-515SS	—	22 AWG Cable ø – 5.6 mm

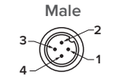
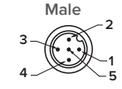
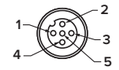
Note: Not all models are shown. Please contact Banner for other available double-ended styles.

M12 Splitters



	Models	Cable Lengths: Branches (Female)	Cable Lengths: Trunk (Male)	Wiring Diagrams
4-Pin	S15YA4-M124-M124-0.2M	2 x 0.2 m	No Trunk	
	S15YA24-M124-M124-0.2M			

M12 Field Wireables

	Male/Female	Straight	Pinout
4-Pin M12 Field Wireable	Male	BFW-M12M4-6X	Male 
	Female	BFW-M12F4-6X	Female  **1** = Brown **2** = White **3** = Blue **4** = Black
5-Pin M12 Field Wireable	Male	BFW-M12M5-6X	Male 
	Female	BFW-M12F5-6X	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	RJ45  **1** = White/orange **2** = Orange **3** = White/blue **6** = Blue
	5 m	STP-M12D-415	Male 
	9 m	STP-M12D-430	**1** = White/orange **2** = White/blue **3** = Orange **4** = Blue 2 x 24 Pair AWG Cable ø – 6.2 mm UTP Stranded
4-Pin Male M12 to 4-Pin Male M12	0.3 m	BCD-M12DM-M12DM-0.3M	Male 
	1 m	BCD-M12DM-M12DM-1M	**1** = White/orange **2** = White/green **3** = Orange **4** = Green 2 x 24 Pair AWG Cable ø – 6.2 mm UTP Stranded

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

IO-Link® HUBS & CONVERTERS

Convert to a Unified Protocol

Legacy devices are common in most industrial settings. These devices have data outputs that include discrete NPN/PNP signals, 4–20 mA signals, 0–10 V signals, and many more types. You can incorporate all these disparate signals into your IO-Link system with Banner's extensive line of IO-Link converters and hubs. After the physical connections are made, the next step is to get all the devices speaking the same language. With Banner IO-Link products, all these signals can be quickly converted to a unified communications protocol. This enables facilities to build a flexible IO-Link network. Many of Banner's IO-Link converters are the size of an AA battery, are simply inserted inline via an M12 connector, and can begin converting signals the instant they're installed.

S15C Converter

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

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

S15C Converter IO-Link®

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

ANALOG
PWM / PFM
Discrete (NPN/PNP)
Modbus
IO-Link®

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

R45C IO-Link to Analog Out Converter

- Compact analog to IO-Link device converter outputs an analog value, voltage, or current, as presented by the IO-Link Master
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- 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 = Integral M12 quick disconnect

IO-Link® HUBS & CONVERTERS

R45C IO-Link to 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
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- Connects directly to a sensor or anywhere in-line for ease of use

Housing	Function		Male		Female 1		Connector
R45	**C**	–	**K**	–	**II**		**Q**

C = Converter
K = IO-Link
II = Analog current in/out
UU = Analog voltage in/out
Q = Integral M12 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 standards
- 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 = Integral M12 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 ports, PNP with 2 inputs/outputs per port
K = IO-Link
Q = M12 integral quick disconnect

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

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**	–	**8B21**	–	**K**	**Q**

R95 = 8-port
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

IO-Link® HUBS & CONVERTERS

R95C Analog Input to IO-Link Hub

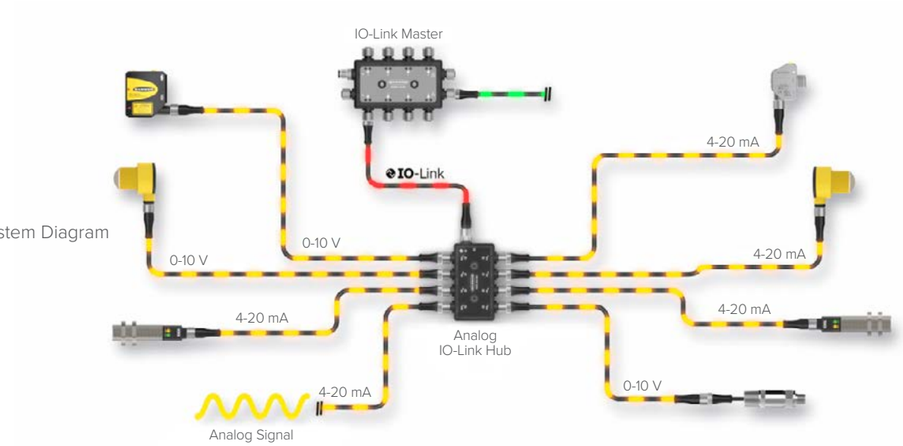
- Compact analog to IO-Link device converter that receives an analog source and outputs the value to the IO-Link master
- R95C IO-Link hubs are a quick, easy, and economical way to integrate non-IO-Link devices into an IO-Link system
- Rugged over-molded design meets IP65, IP67, and IP68 standards
- Connects directly to a sensor or anywhere in-line for ease of use

Housing	Function		Converter		Control	Connector
R95	**C**	–	**8UI**	–	**K**	**Q**
	C = Converter		**8UI** = 8 port, analog, 1 input per port		**K** = IO-Link	**Q** = M12 Integral quick disconnect

Integrate Analog Devices Into Your IO-Link System

Banner's R95C 8-port Analog Input IO-Link Hub simplifies adding analog devices to an IO-Link system. It takes up to eight analog signal inputs (either current or voltage) and consolidates them into one IO-Link data stream. The R95C reduces the need for shielded cabling, using simple 4-wire M12 cordsets and connections to save installation time and hardware costs, while eliminating the need for expensive PLC analog input cards.

R95C System Diagram



Accessories

SMBR90S
Mounting Bracket
(use multiples to stack)

SMBR95RA
Right-angle
Mounting Bracket

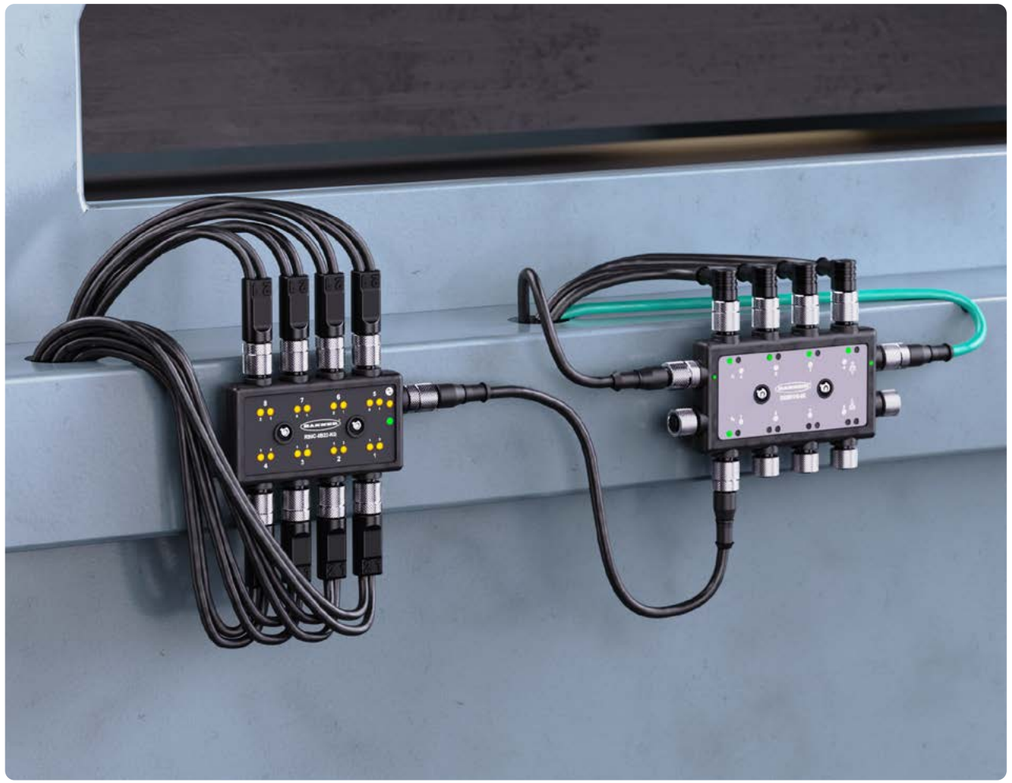
LMBM12MAG
Attaches to
M12 cordset end
(magnetic)

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

LMBM12SP
Attaches to
M12 cordset end

LMBS15MAG
Attaches to S15C
(magnetic)

LMBS15SP
Attaches to S15C



Build Your Network

Banner IO-Link masters serve as the gateway for the connection of IO-Link devices, including sensors, lighting products, IO-Link Hubs, and more. Banner IO-Link masters are the most compact in the industry and enable users to flexibly send IO-Link data where it needs to go, whether it's to a PLC, HMI, SCADA or cloud platform such as Banner CDS.

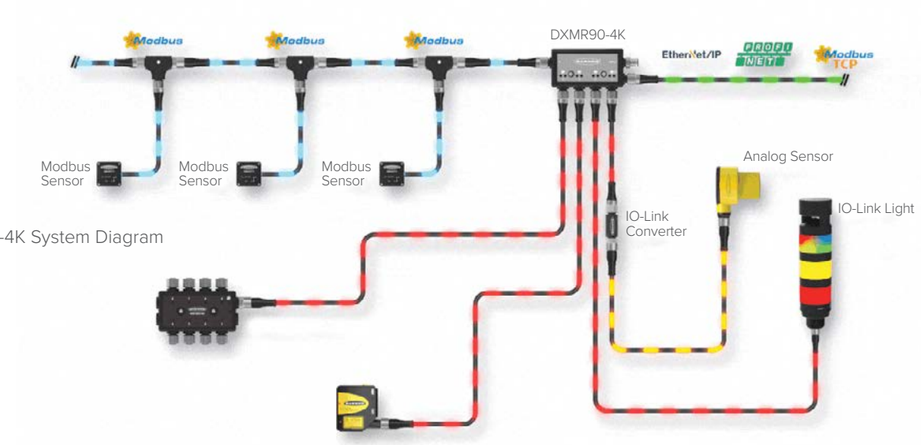
DXMR90-4K Multiprotocol IO-Link Master

The DXMR90-4K IO-Link Master houses a processor that receives signals from sensors and other connected devices through four dedicated IO-Link ports. As a centralized hub, the DXMR90 combines all these signals into one unified stream of insightful data, which can be exported via industrial Ethernet protocols. The controller also has advanced programmability via scriptbasic and action rules that allows facilities to use the IO-Link master as a controller in a standalone application, eliminating the need for a PLC. The DXMR90-4K IO-Link Master also has a Modbus RTU client port for expanding your connection possibilities.

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

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

Accessories

SMBR90S
Mounting Bracket
(use multiples to stack)

SMBR90RA
Mounting Bracket

SMBR90RADIN
DIN Rail
Mounting Bracket

SMBR90RAMAG
Magnetic
Mounting Bracket

PSW-24-1
Power Supply

STP-M12D-406
Ethernet Cordset

DXMR110-8K Multiprotocol IO-Link Master

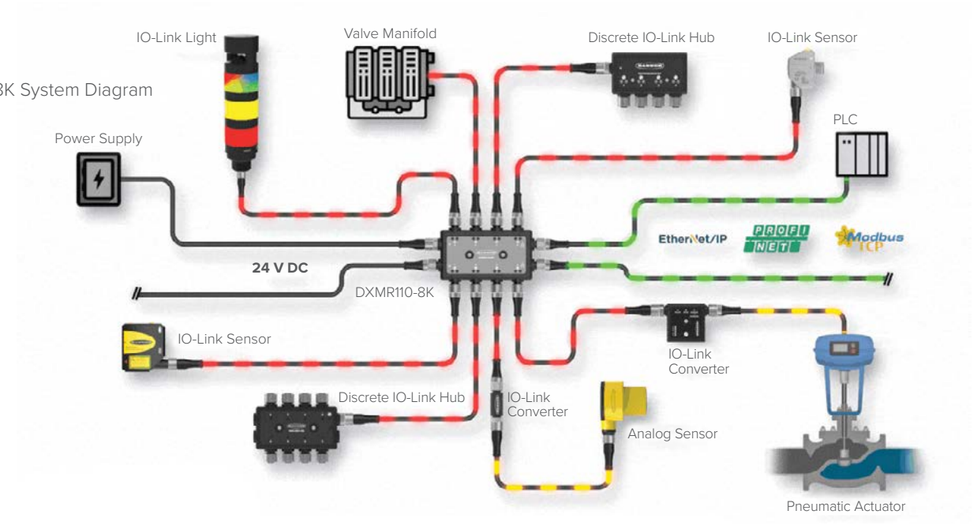
- Local control or connectivity with automation protocols, including EtherNet/IP, Modbus/TCP, and PROFINET
- Logic processing and problem-solving capable of deploying solutions to process and control data from multiple devices
- IP67 housing simplifies installation in any location by eliminating the need for a control cabinet
- Consolidation of 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

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, or 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.

R45C IO-Link Master with Modbus RTU Interface

- 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-disconnects
- Two 4-pin M12 female quick-disconnects
- 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 standards

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 QD

R90C IO-Link Master with Modbus RTU Interface

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® CONSUME DATA

Consume Data to Optimize Productivity

IO-Link data is typically sent to a higher-level control system or a supervisory device. This can be a programmable logic controller (PLC), a distributed control system (DCS), a human-machine interface (HMI), a cloud dashboard such as Banner Cloud Data Services, or any other compatible device that can process and interpret the IO-Link data. The specific destination depends on the system architecture and the intended application of the IO-Link communication.

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.

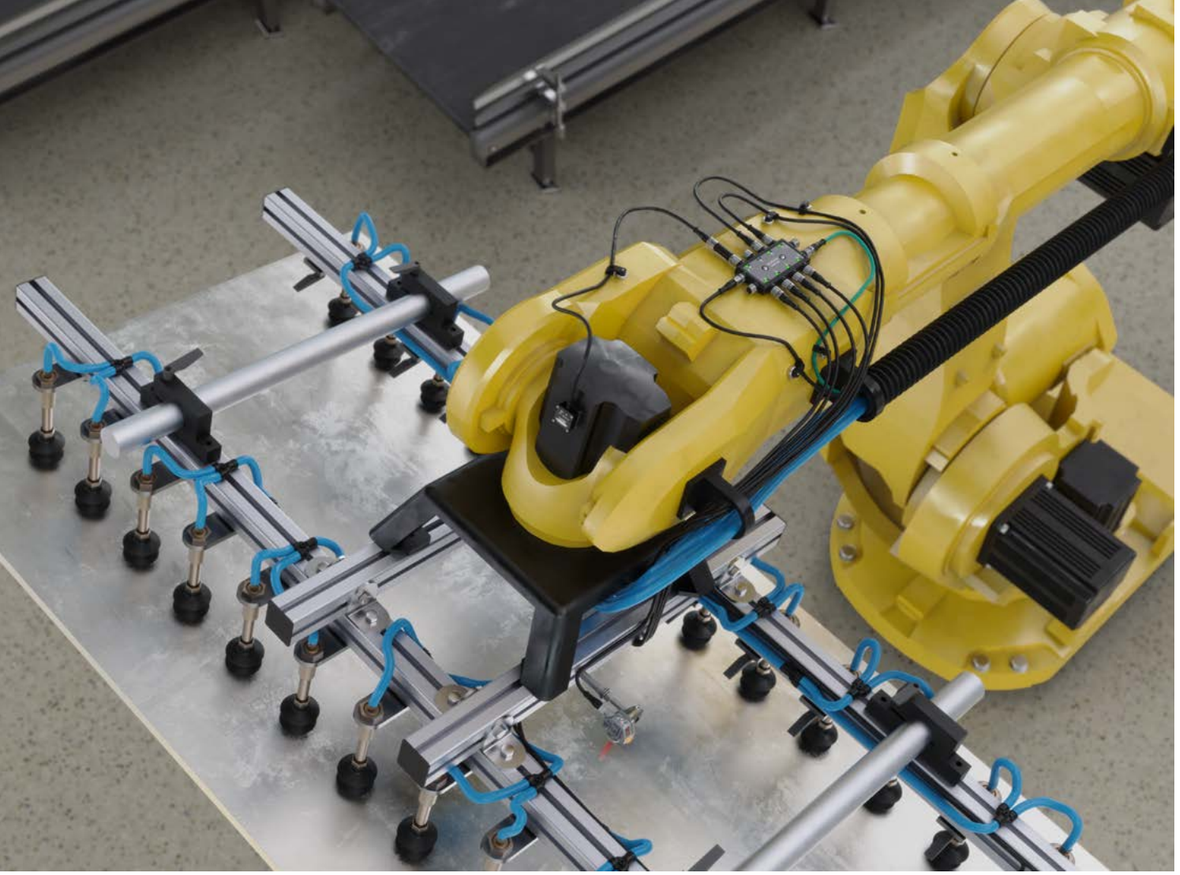
Banner Cloud Data Services (CDS)

- 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.
- Users can remotely access data anytime and anywhere using an internet-connected device. In addition, they can define parameters to control when to receive notifications via email or SMS message. On-demand visibility and real-time alerts allow remote monitoring and diagnosis of systems quickly.
- Predictive maintenance is a key capability of Banner's IIoT solutions. The CDS 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

- IO-Link's unique open architecture allows you to send data where you need it.
- Banner's IO-Link masters support EtherNet/IP®, Modbus/TCP, PROFINET, and Modbus RTU, so that data can be interfaced with industrial systems flexibly.

Visit **bannercds.com** for more information




BANNER
4
3
2
1
C


BANNER

More Sensors, More Solutions.

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

SCAN ME

BANNER
more sensors, more solutions

1-888-373-6767 • bannerengineering.com

PN B_51828679 rev. A