GuardLink™

Device level safety linking technology

Introducing GuardLink 2.0

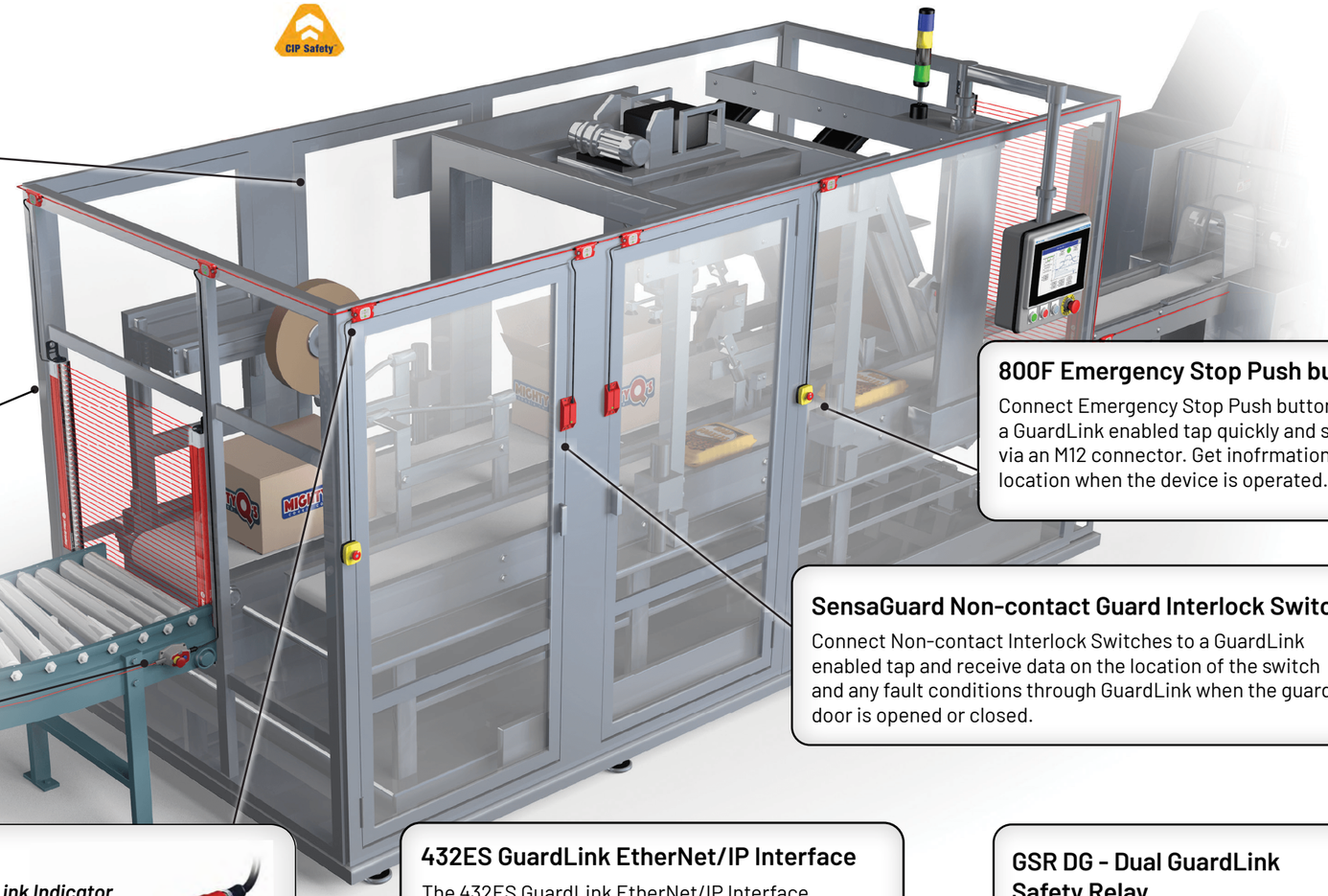
Allen-Bradley
by ROCKWELL AUTOMATION

Rockwell Automation

Smart Safety - over EtherNet/IP connectivity

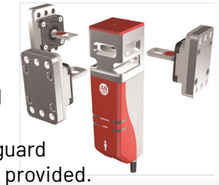
Allen-Bradley
by ROCKWELL AUTOMATION

EtherNet/IP
CIP Safety



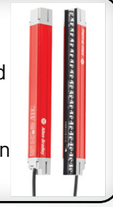
440G-MZ Guard Locking Interlock Switch

Guard Locking switches lock/unlock signals can be provided, giving the devices current state and specific location within the system. Individual indication of the guard doors state including guard open, guard closed, guard locked or guard unlocked can also be provided.



450L Light Curtains

450L Light curtains can be connected simply to GuardLink via a GuardLink enabled tap. Access to the light curtains status along with the location can be communicated.



800F Emergency Stop Push button

Connect Emergency Stop Push buttons to a GuardLink enabled tap quickly and simply via an M12 connector. Get inofrmation on its location when the device is operated.

Lifeline 5

Connect a Lifeline™ 5 Cable Pull Switch to get the location of the device and rope tension status to avoid nuisance trips from occurring when operated.

SensaGuard Non-contact Guard Interlock Switch

Connect Non-contact Interlock Switches to a GuardLink enabled tap and receive data on the location of the switch and any fault conditions through GuardLink when the guard door is opened or closed.

GuardLink Enabled Tap Indication

LED Input Indicator

Green = Connected input device healthy

Flashing Green = Connected input device healthy but fault on system

Red = Trip on connected input device

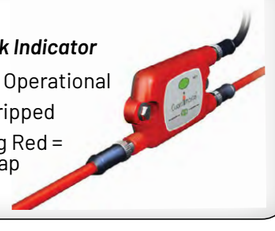
Flashing Red = Connected input device has not performed correctly

LED Link Indicator

Green = Operational

Red = Tripped

Flashing Red = Faulty tap



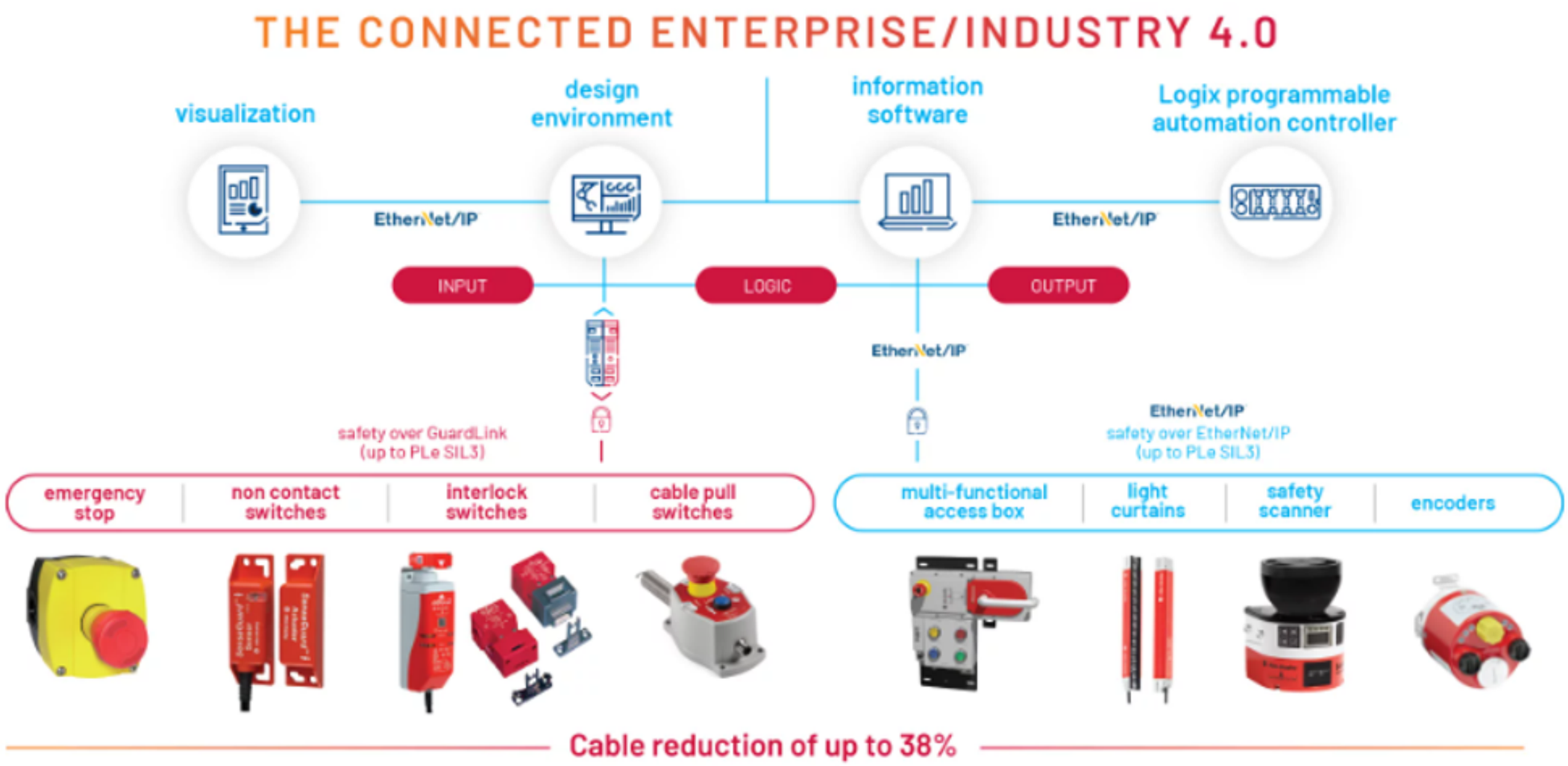
432ES GuardLink EtherNet/IP Interface

The 432ES GuardLink EtherNet/IP Interface monitors three independent channels of GuardLink enabled devices and communicates the status of those devices to a safety-rated controller over a CIP Safety EtherNet/IP network.

GSR DG - Dual GuardLink Safety Relay

The GSR DG - Dual GuardLink Safety Relay can monitor two GuardLink channels and communicate status information for each safety input device via the EtherNet/IP Network Interface

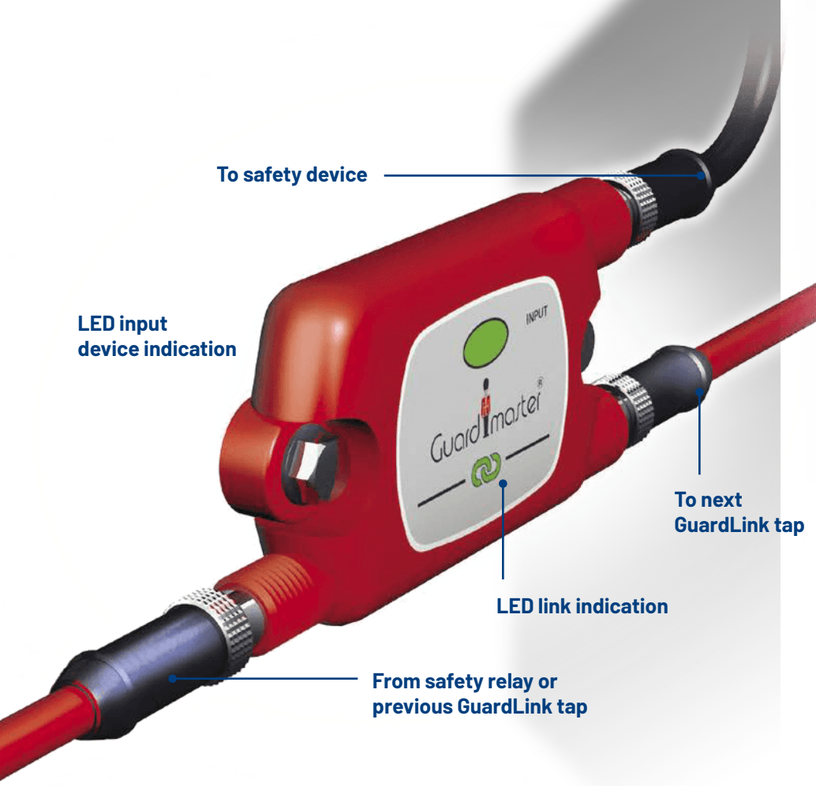
Smart safety devices



Smart Safety solutions provide detailed diagnostic data to your design environment, visualization system, information software, and GuardLogix® Programmable Automation Controller – enabling Smart Machines for Smart Manufacturing and helping to increase productivity and minimize downtime while reducing total cost of ownership.

GuardLink

Device level safety linking technology



to **diagnostic data** when the safety function occurs

- No configuration is required, with wiring achieved through the use of standard cables with M12 connectors
- A maximum of 32 safety input devices can be connected in series
- GuardLink enabled taps allow standard safety input devices with either electromechanical or solid state safety outputs to be connected to a GuardLink system
- Device connections available for both 4-pin, 5-pin and 8-pin devices
- Taps available for power-to-release and power-to-lock guard locking applications.
- Remote lock/unlock and fault reset of safety input devices can be achieved
- Passive taps allow safety input devices with built-in GuardLink technology to be connected to a GuardLink system
- Certified for applications up to and including PLe Cat 4 (ISO 13849-1) and SIL 3 (IEC 61508)

Why choose GuardLink?

Series connection of safety input devices is common practice in safety-related control systems. However, when the system trips, fault finding can be difficult due to the lack of diagnostic information. Providing diagnostics historically meant connecting auxiliary contacts from each safety input device to the PLC increasing costs due to the need for additional input cards, and increased installation time to hard wire each auxiliary contact to the allocated input. GuardLink provides both safety information and diagnostics through the same cable, with the diagnostics available via EtherNet/IP™, reducing the amount of wiring required for the safety system, and the cost and time to install the solution.

GuardLink 2.0 Protocol

The advanced diagnostics of GuardLink 2.0 features are achieved using the Series B GuardLink-enabled 'smart' taps and the Series B 440G-MZ guard locking switches along with the 432ES-IG3.

GuardLink 2.0 provides **automatic diagnostics reporting** enhanced warning and fault conditions to help reduce troubleshooting and machine down time.

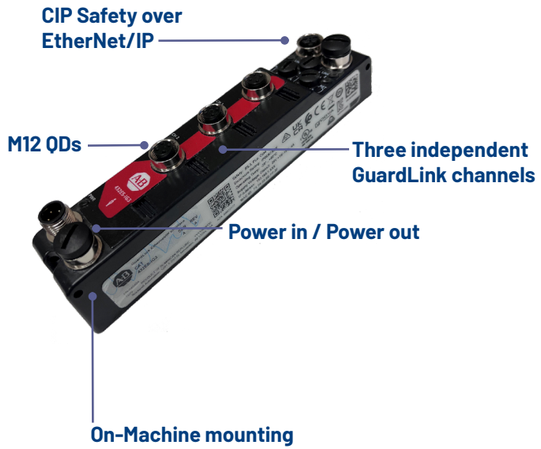
432ES Interface	440S Taps	440G-MZ
Internal fault	Internal fault	Internal fault
Low system power warning	Low system power warning	Low system power warning
High system power warning	High system power warning	High system power warning
Channel faulted	Short circuit	GuardLink signal fault
Terminator fault	GuardLink signal fault	Invalid actuator fault
Too many devices	Discrepancy fault	Teach process error
Unverified device		Teach limit exceeded
Ethernet port disconnected		Lock detection fault
		Locking fault
		Actuator detection fault
		Actuator not paired
		End of life warning
		Over temperature
		Under temperature

GuardLink

Controller and communication technology

GuardLink provides two control and communication alternatives.

432ES GuardLink EtherNet/IP Interface (432ES-IG3)



- GuardLink 2.0 protocol with enhanced diagnostics
- CIP Safety over EtherNet/IP compatible with GuardLogix L3 and L8 controllers
- Linear, star, or DLR network connections
- On-machine mounting, IP66, 67 and 69K
- Three independent GuardLink channels up to 32 devices per channel
- Control 1, 2, or up to 3 machine zones
- Power in and power out connections for daisy chaining with similar products
- Automatic diagnostic reporting when used with PanelView™ 5000 displays and Factory-Talk® View Site Edition.

Dual GuardLink Relay with GuardLink EtherNet/IP Interface (440R-DG2R2T (DG) with 440R-ENETR)

- GuardLink 1.0 protocol with sequential diagnostics
- Standard message communication over EtherNet/IP compatible ControlLogix controllers
- Linear, star, or DLR network connections
- In-cabinet mouting, IP40
- Two GuardLink channels, up to 32 devices per channel
- Inputs can also connect to devices with OSSD and mechanical contacts
- Control one zone with each DG relay

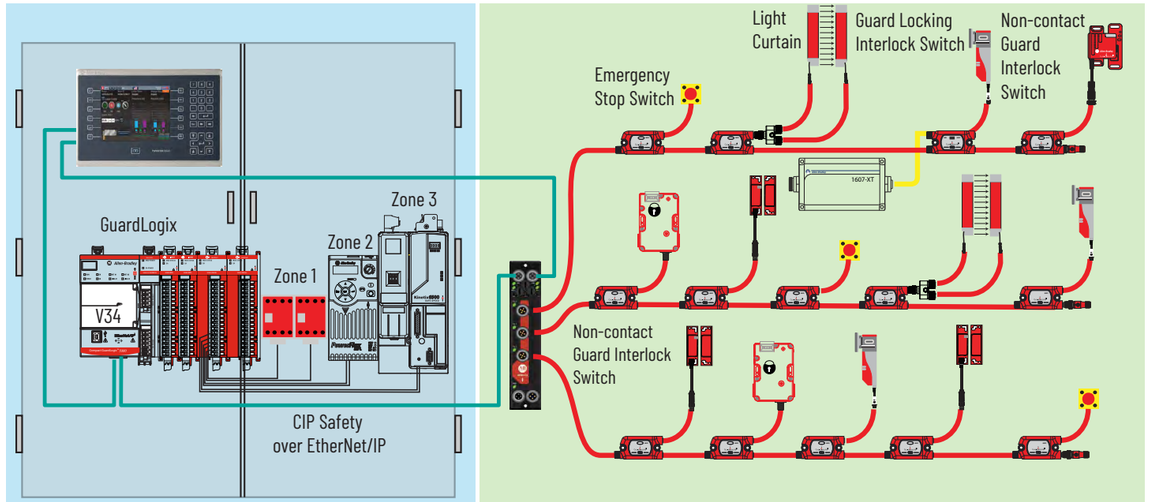
The safety device is connected to a GuardLink enabled connection tap or a passive tap in a trunk and drop topology. The DG Guardmaster safety relay monitors up to two GuardLink circuits. Or use the 432ES EtherNet/IP On-Machine™ GuardLink adapter to control up to three zones with directly linking the GuardLink system to The Connected Enterprise®.

GuardLink

System examples

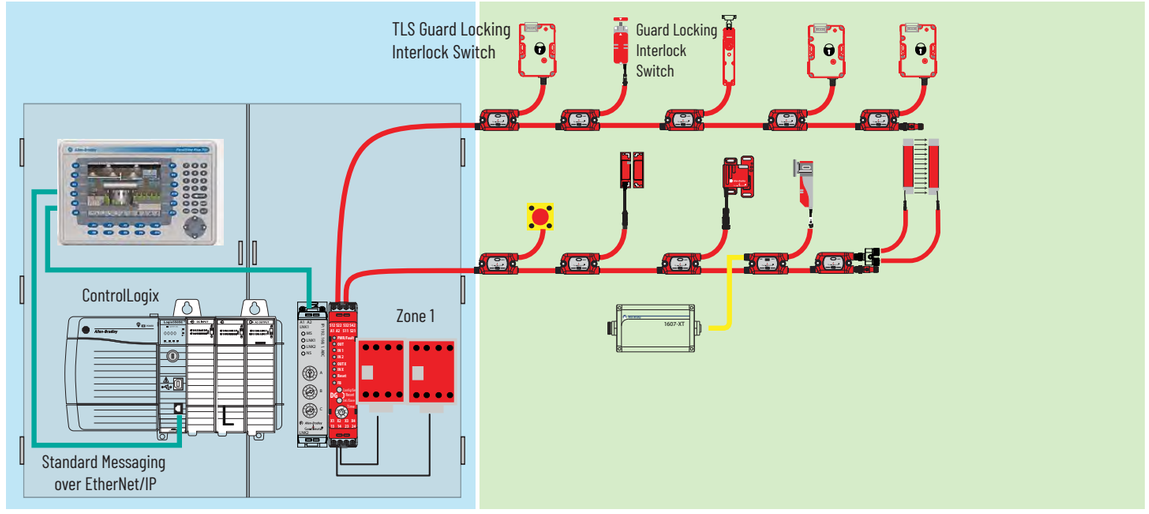
In-Cabinet | **On-Machine**

432ES GuardLink EtherNet/IP Interface (432ES-IG3)



Three independent GuardLink channels controlling three machine zones with a GuardLogix® controller.

Dual GuardLink Relay with GuardLink EtherNet/IP Interface (440R-DG2R2T (DG) with 440R-ENETR)



Two GuardLink channels controlling one machine zone, with lock control from a ControlLogix® controller.

Ordering details

Product	Description	GuardLink Protocol
	432ES-IG3, network cable and power cable	
432ES-IG3	GuardLink EtherNet/IP™ Network Interface	2.0
1585D-M4UBJM-*(1)	Ethernet Cable: Cat5e, 100 Mbit/s, 4 Conductors, M12, Straight Male, RJ45, Straight Male, Teal, PUR	-
889D-F4AE-*(2)	Cordset: DC Micro (M12), Female, Straight, 4-pin, PVC, Yellow, Unshielded, No Connector, 18 AWG	-
	Safety Relay, Ethernet/IP Network Intergace and cable to the first GuardLink enabled tap	
440R-ENETR	EtherNet/IP™ Network Interface	-
440R-DG2R2T	Guardmaster™ Safety Relay Dual GuardLink	1.0
889D-F4NE-*(2)	Cordset: DC M12, Female, Straight, 4-pin, PVC, Red, Unshielded, No Connector, 18 AWG	-
	GuardLink enabled taps and cables to connect between the taps	
400S-SF5D	5-Pin GuardLink enabled tap for use with 4- or 5-pin electronic safety input devices	2.0
440S-SF8D	8-Pin GuardLink enabled tap for use with 8-pin electronic safety input devices, power-to-release	2.0
440S-SLF8D	8-Pin GuardLink enabled tap for use with 8-pin electronic safety input devices, power-to-lock	2.0
440S-MF5D	5-Pin GuardLink enabled tap for use with 4- or 5-pin electromechanical safety devices	2.0
440S-MF8D	8-Pin GuardLink enabled tap for use with 8-pin electromechanical safety devices, power-to-release	2.0
440S-MLF8D	8-Pin GuardLink enabled tap for use with 8-pin electromechanical safety devices, power-to-lock	2.0
440S-PF5D	5-Pin Passive tap for use with 5-pin GuardLink-enabled safety devices	-
440S-PF5D4	5-Pin Passive power tap for use with 5-pin GuardLink-enabled safety devices and additional power	-
889D-F4NEDM-*(3)	Patchcord: DC M12, Female, Straight, 4-pin, PVC, Red, Unshielded, DC M12, Male, Straight, 18 AWG	-
	Connection cables from the GuardLink enabled taps to the input devices	
889D-F4NEDM-*(4)	Patchcord: DC M12, Female, Straight, 4-pin, PVC, Red, Unshielded, DC M12, Male, Straight, 18 AWG	-
889D-F5NCDM-*(4)	Patchcord: DC M12, Female, Straight, 5-pin, PVC, Red, Unshielded, DC M12, Male, Straight, 22 AWG	-
889D-F8NBDM-*(4)	Patchcord: DC M12, Female, Straight, 8-pin, PVC, Red, Unshielded, DC M12, Male, Straight, 24 AWG	-
	GuardLink-enabled switches	
440G-MZ Ser. B	Guard locking switch, power-to-release, power-to-lock, standard or unique, escape release. See 440G-UM004 for selection	2.0
	Accessories	
898D-418U-DM2	Terminator for last GuardLink tap	-
440S-GLTAPBRK1	GuardLink tap mounting bracket - QTY 1	-
440S-GLTAPBRK5	GuardLink tap mounting bracket - QTY 5	-

(1) Replace * in order number with 0M15, 0M2, 0M3, 0M6, 1, 2, 2M5, 3, 4, 5, 10, 15, 20, 30 or 40 for standard cable length in meters

(2) Replace * in order number with 0M3, 0M6, 1, 2, 5, 10, 15, 20 or 30 (max) for standard cable length in meters

(3) Replace * in order number with 0M3, 0M6, 1, 2, 5, 10, 15, 20 or 30 for standard cable length in meters (30 m max with guard locking, 100 m max with no guard locking)

(4) Replace * in order number with 0M3, 0M6, 1, 2, 5 or 10 (max) for standard cable length in meters

where 0M15=150 mm, 0M2=200 mm, 0M3 =300 mm, 0M6=600 mm, 2M5=2.5 m

Next generation of machinery safety devices

440G-LZ Guard Locking Interlock Switch

The 440G-LZ Guard Locking Interlock Switch is designed for partial body access guard doors. This switch combines microprocessor technology with an RFID coded actuator and features a locking bolt drive mechanism that locks only when the correct actuator is detected. The switch is TÜV certified to PLe, Cat. 4 (ISO 13849-1) which is the highest level of safety for guard door position and lock monitoring.

450L GuardShield POC Safety Light Curtain

This next generation light curtain system features a patented transceiver technology. The functionality of a pair of 450L GuardShield™ safety li ght curtains can be selected by inserting plug-in modules. Once powered up, the transceiver learns its functionality from the plug-in module and begins operating as a transmitter or a receiver. A selection of plug-in modules are available offering different functions. This greatly reduces stock and provides a flexible,cost-effective safety solution that is ideal for hand and finger detection.

Lifeline 5 Cable Pull Switches

The 440E Lifeline™ 5 Cable Pull Switches are microprocessor-based solutions that bring advanced features and diagnostics that help enhance safety and improve productivity. These switches offer features and functions that simplify setup and allow for more efficient maintenance and troubleshooting.

SensaGuard Non-contact Interlock Switches

The SensaGuard™ Non-contact Interlock Switches feature the latest generation of RFID technology for coding and inductive technology for sensing. These switches have a large sensing range and tolerance to misalignment. They are cost-effective solutions for a wide range of industrial safety applications.

Safety, Compliance and Productivity

Rockwell Automation has a well-deserved reputation for helping you improve productivity and quality. We're also the world's largest safety system provider.

Rockwell Automation is the industry leader in safety & compliance, helping reduce injuries and costs while improving productivity throughout your site. Our expertise, experience, and products have established us as the world leader in industrial safety technology, enhancing your business performance with functional safety solutions.

Best-in-Class Safety & Productivity

Multiple studies have shown that safety and productivity go hand in hand. These studies identified three key elements separating best-in-class plants from average performers:

- The safety culture
- A formalized risk management strategy
- Use of technologies that significantly improve both safety and productivity

Reduce Time to Design, Develop and Deliver Safety Solutions

Rockwell Automation can help improve your performance through formalized risk management practices and technologies to identify and mitigate machine, process, and electrical safety hazards. We provide the industry's most complete offering of safety services and products, and a suite of tools to help accelerate safety system development and ensure compliance.

Rockwell Automation, Inc. (NYSE:ROK), the world's largest company dedicated to industrial automation, makes its customers more productive and the world more sustainable. Throughout the world, our flagship Allen-Bradley® and Rockwell Software® product brands are recognized for innovation and excellence.

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