

## Banner In-Series Diagnostics



**Cut costs by preventing and reducing downtime**  
Local operator guidance and remote actionable data



**Reduce and simplify wiring**  
Up to 32 plug-n-play devices with one in-series connection — achieves the highest level of safety; up to Category 4, PL e, SIL CL 3

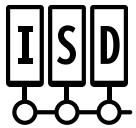


**Intuitive setup and PLC integration**  
Easy to use software and auto tag export



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Banner  
In-Series  
Diagnostics

# ISD-Enabled Products by Banner

## RFID Safety Switches



- High tolerance to misalignment and provides data to prevent downtime
- Basic, medium and high tamper resistance models available
- Features an IP69 rating and resistance to both vibration and metal shavings
- Cascade up to 32 sensors while achieving the highest level of safety

## Illuminated E-Stops



- Illuminated base flashes red to quickly identify which button has been pressed
- Illuminated base turns green, yellow or unlit to indicate it is armed and ready for operation
- Unique OSSD Safety outputs simplify wiring and allowing it to be included in an In-Series Diagnostics (ISD) chain
- Cascade up to 32 devices while achieving the highest level of safety

## SC10 Safety Controller



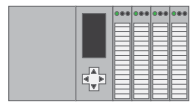
- Free and intuitive PC configuration software
- Connects up to 64 ISD devices, and has 6 available safe inputs for other devices
- Two independently controlled safety relay outputs, with 6 Amps each
- Industrial Ethernet two-way communication enables 256 virtual non-safe status outputs and 80 virtual non-safe inputs

# Add a Non-ISD Device to an ISD Chain

## In-Series Diagnostics System Overview



HMI



PLC



## ISD Connect



- Add any safety device with 2 normally closed sets of contacts to an ISD Chain.
- Bright LEDs for simplified local diagnostics
- Flexible mounting in any orientation with integral mounting hole and visible LEDs on both sides
- Add up to 32 Non-ISD devices to an ISD Chain and achieve up to the highest level of safety

## ISD Connect Compatible



SI-QS90E-Q5A

Mechanical Safety Switch - plastic body  
(52 x 90 mm)



SI-LM40KHE-Q5A

Mechanical Safety Switch - metal body  
(40 x 119 mm)



SI-LS100F-Q5A

Mechanical Safety Switch - plastic body  
(31 x 100 mm)



SI-LS83E-Q5A

Mechanical Safety Switch - plastic body  
(30 x 83 mm)



SI-HGZ63-FQDxx

Zinc Hinged Safety Switch



MQEAC-601-Q5A

SI-HG63 to ISD Connect  
adaptor cable



CSE5A-M1251M1251

Two mechanical switches to  
ISD Connect adaptor cable



SSA-EB1P-02-A01

30 mm Panel-mounted E-Stop  
w/ M12 QD pigtail

# Software To Design, Configure, and Manage Your Safety System

Prevent Downtime:

**Marginal**

Alert to check Door 1 for misalignment  
before it causes downtime

**Warning**

Alert to check E-Stop 1 for low voltage  
before it causes downtime

Troubleshooting Made Easy:

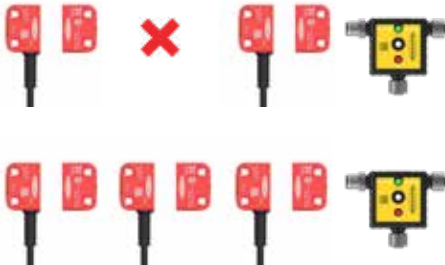
Terminator missing



Actuator not taught



Wrong number of devices



Equipment Functional View Wiring Diagram Ladder Logic Configuration Summary Live Mode ISD

Terminator Plug	Name	Status	Alert	Actuator
1	Door 1	On	Marginal	Detected
2	Door 2	Off	Warning	Detected
3	Door 3	Reset	Fault	Detected
4	Door 4	Reset	Fault	Detected
	MQChain 1	Reset	Fault	Detected

Terminator Missing: Actuator not Taught

Terminator Plug	Name	Status	Alert	Actuator
1	EStop 1	On	Marginal	Detected
2	EStop 2	Off	Warning	Detected
3	EStop 3	Reset	Fault	Detected
4	EStop 4	Reset	Fault	Detected
	MQChain 2	Reset	Fault	Detected

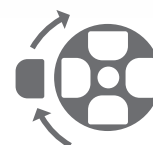
Chain:1 Device:1 Close

Expected Code	9D1A
Received Code	9D1A
Internal Temperature	75 C
Actuator Distance	13.8 mm
Supply Voltage	21.5 V
Output 1	False
Output 2	False
Actuator Detected	True
Wrong Actuator	False
Marginal Range	True
Input 1	False
Input 2	False
Local Reset Expected	False
Output Error	False
Safety Input Fault	False
ISD Data Error	False
Operating Voltage Error	False
Power Cycle Required	False
Operating Voltage Warning	False
Sensor Not Paired	False
Device	Door Switch
Teach-ins Remaining	0
Number of Voltage Errors	0
Output Switch-off Time	Inactive
Range Warning Count	0
Expected Company Name	0000
Received Company Name	0000
Internal Error A	0000
Internal Error B	0000
Local Reset Unit	False
High Coding Level	True
Cascadable	True
Fault Tolerant Outputs	True

Up to 32 ISD safety devices in any order per chain

Reduce Downtime:  
Local operator guidance to activated E-Stop

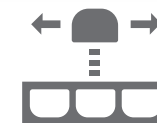
Additional uses for ISD



Rotation/Indexing



Tool Identification



Position Verification

- Simplified wiring using T-adapters and cost-effective 4-pin cables
- Achieves the highest level of safety; up to Category 4, PL e, SIL CL 3



## SC10-2roe

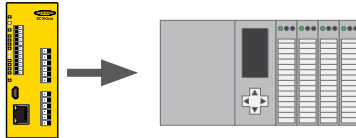
### Expedite PLC Integration with Tag Export Feature

- Eliminates error-prone manual entries
- Import tags to PLC via .csv or .xml files
- Defines actionable In-Series Diagnostic data within the PLC
- For more information visit [bannerengineering.com/safetycontroller](http://bannerengineering.com/safetycontroller)

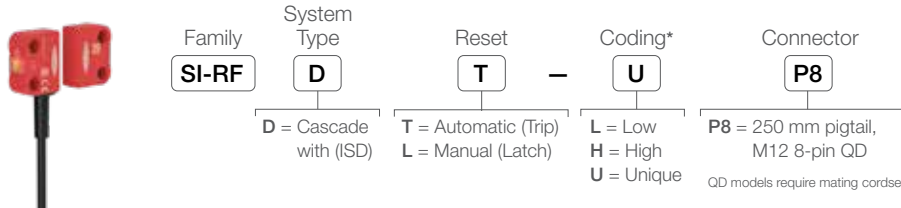


## SC-XM3 Fast Programming and Swapout

- Backup copy of configuration, password, network settings
- Download configuration without a PC
- Save time during panel build
- Fast swapout minimizes downtime



## RFID Safety Switches

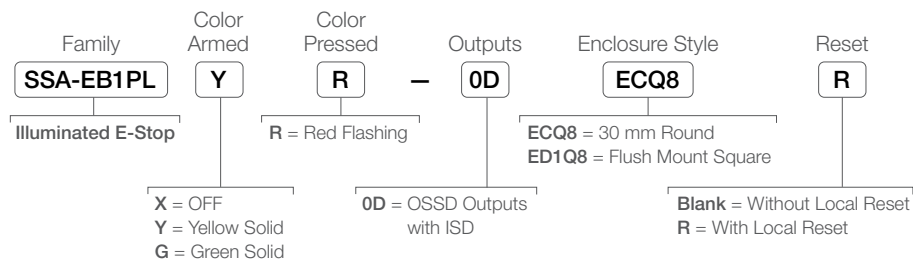


**NOTE: SI-RF-A Actuator is required to complete a sensor solution. Ordered separately.**

### \* Tamper Resistant Coding

- Low (L)—The SI-RF Safety Switch accepts any SI-RF-A actuator
- High (H)—The SI-RF Safety Switch only accepts the last taught-in actuator, a maximum of 12 teach-in processes are possible
- Unique (U)—The SI-RF Safety Switch only accepts the taught-in actuator, and only one teach-in process is possible

## Illuminated E-Stops



## ISD Connect

