# Banner In-Series Diagnostics



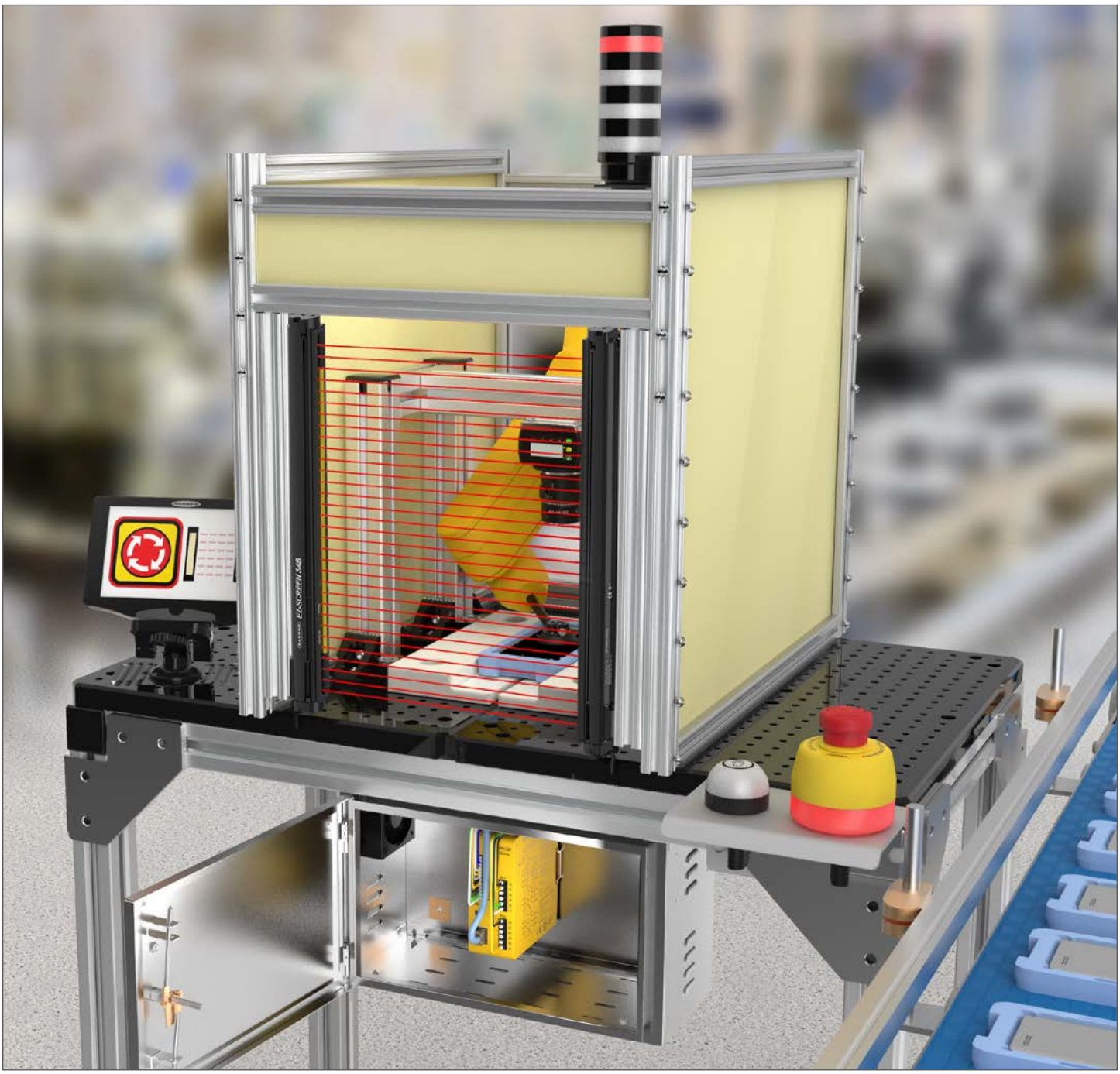
## Banner In-Series Diagnostics

**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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## Cut Costs by Preventing and Reducing Downtime

### Gather Real-Time Data About Safety Systems

In-Series Diagnostics gives machine owners and operators greater insight into the health and performance of their equipment, making them less reliant on outside experts to solve system problems. Users can monitor the status of each device in their safety system in real-time, identify the location and nature of any potential problems, and receive alerts if a critical event does occur, so equipment can get back up and running as soon as possible.



## Reduce and Simplify Wiring

### Cost-Effective and Easy to Implement

Connect up to 32 ISD devices in a series chain using plug-and-play industry standard M12 4-pin cables and T-connectors. The ISD protocol overlays the diagnostic data for each device on top of the safety OSSD signal wires, delivering the highest level of safety and advanced diagnostic over two wires. This error-proofs the system, reduces controller I/O, and eliminates the time, hassle, and expense of running designated cables between the device and control panel.




## Intuitive Setup and PLC Integration

### Easy to Design and Implement

Create a safety configuration in mere minutes with the free PC software, which provides an intuitive on-screen interface incorporating drag-and-drop icons. Download the configuration using the XM3 external memory drive, no PC required. Integration with the PLC is made easy with the export-tag feature that automates the typical manual entry of tag values in the PLC. Quickly set the controller's IP address using the on-board LCD display via the ClickSet IP feature.

Banner
In-Series
Diagnostics

# ISD-Enabled Products by Banner

## SC10 Safety Controller





- Safety Controller + ISD to PLC Gateway
- Easy to configure with free PC software
- Connect up to 64 ISD devices
- Supports up to 70 total safety devices
- Two independently controlled 6A safety relay outputs
- Profient, Ethernet/IP, Modbus TCP

## XS26-ISDd Safety Controller





- Safety Controller + ISD to PLC Gateway
- Easy to configure with free PC software
- Connect up to 256 ISD devices
- Expandable up to: 394 total safety devices and 68 safety outputs
- Profient, Ethernet/IP, Modbus TCP

## ISD to IO-Link Modules

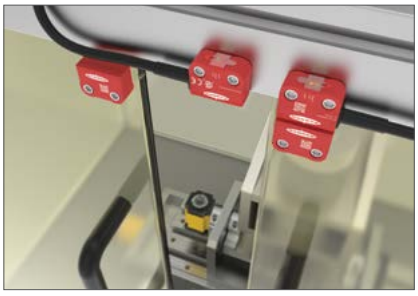




- Compact field device
- ISD to IO-Link Gateway
- Connect up to 32 ISD devices
- Easily daisy-chain to a separate safety relay or controller
- IP20 and IP69 models available

## RFID Safety Switches





- High tolerance to misalignment
- 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 ISD devices while achieving the highest level of safety

## Illuminated E-Stops





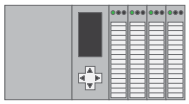
- Illuminated base flashes red to quickly identify which button has been pressed
- Illuminated base is green, yellow, or unlit to indicate it is armed and ready for operation
- Unique OSSD safety outputs simplify wiring and allow it to be included in an In-Series Diagnostics (ISD) chain
- Cascade up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

# Add Other Safety Devices to an ISD Chain

**In-Series Diagnostics System Overview**



HMI



PLC

EtherNet/IP

Modbus TCP/IP

PROFINET





## ISD Connect





- Add any safety device with two 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 the highest level of safety

## Compatible with ISD Connect



**SSA-EB1P-02-A01** — 30 mm Panel-Mounted E-Stop with M12 QD Pigtail



**SI-GL42** — Locking Safety Switch



**SI-HGZ63FQDxx** — SI-HG63 Series Hinged Safety Switch



**MQEAC-601-Q5A** — SI-HG63 to ISD Connect Adapter Cable



**CSE5A-M1251M1251** — Two Mechanical Switches to ISD Connect Adapter Cable

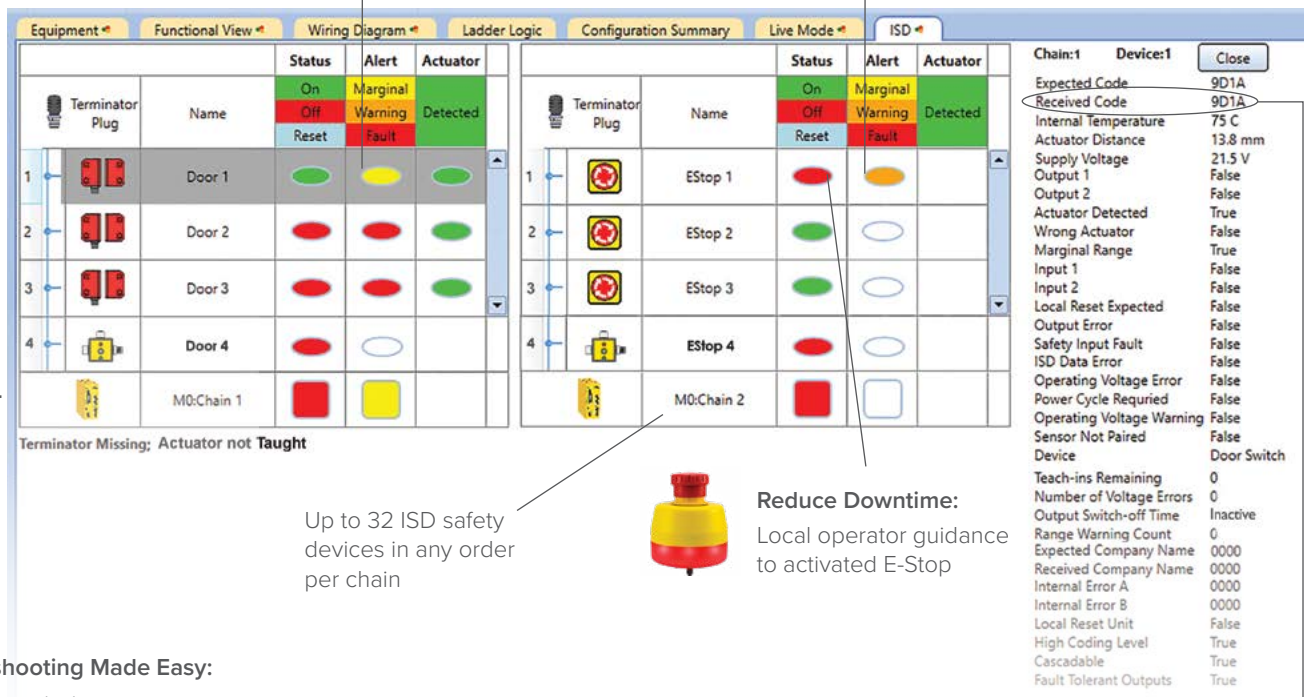
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# Software to Design, Configure, and Manage Your Safety System

**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



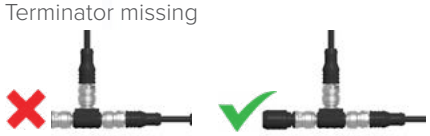

Up to 32 ISD safety devices in any order per chain

**Reduce Downtime:**

Local operator guidance to activated E-Stop

**Troubleshooting Made Easy:**

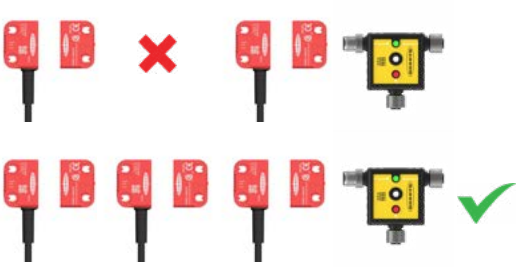
Terminator missing



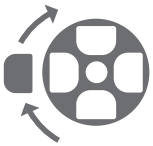
Actuator not taught



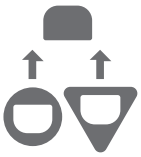
Wrong number of devices



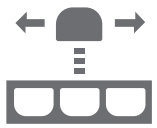
**Additional Uses for ISD**



Rotation/Indexing



Tool Identification



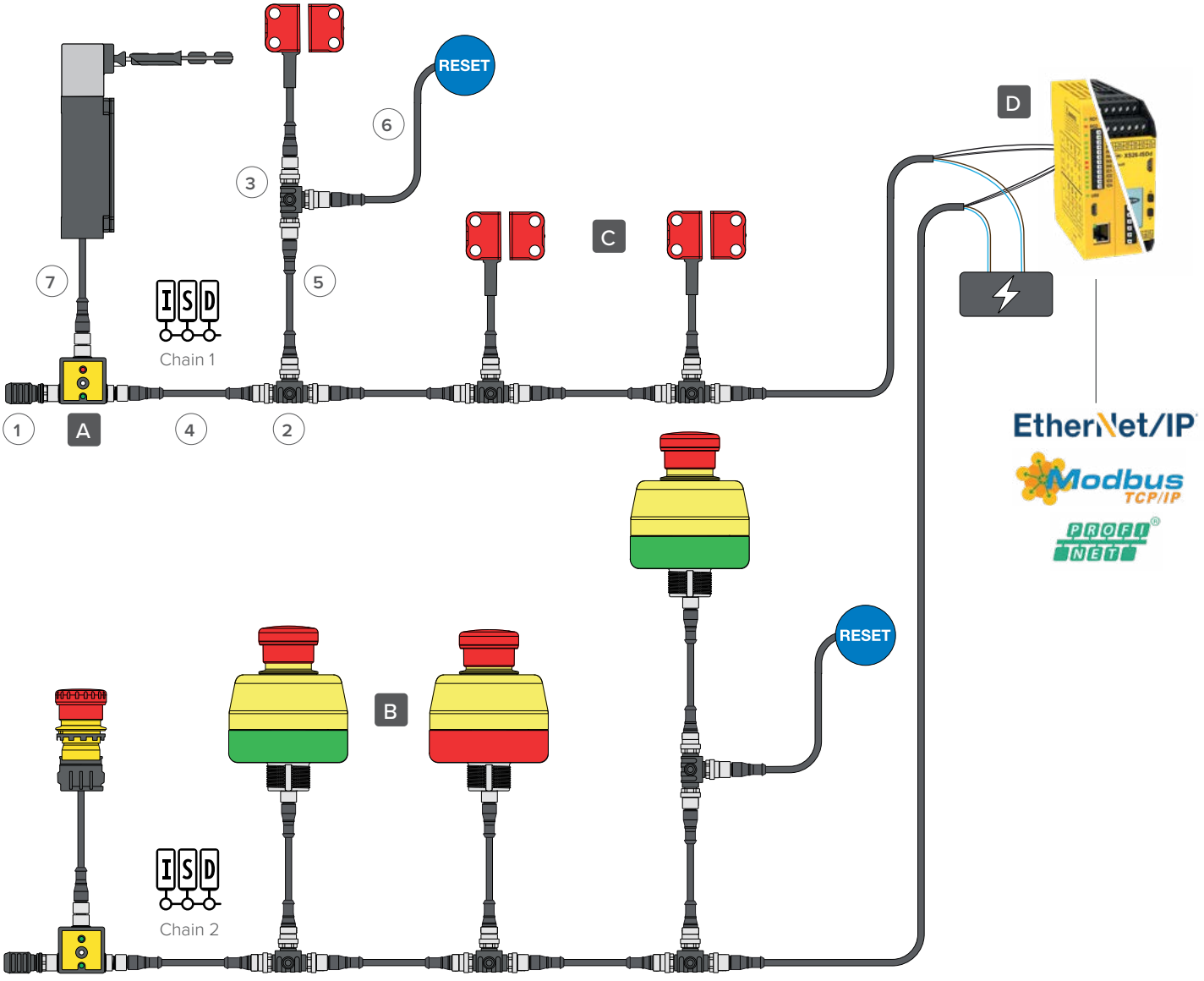
Position Verification

## Easy to Implement with AutoDetect ISD

Upon initial power-up, the system activates AutoDetect ISD, which identifies devices added to the ISD chains and informs the PLC of these changes. With this new feature, users can add up to 256 ISD devices with a few clicks of a mouse. It provides flexibility for dynamic safety system configurations—users can add, move, or remove safety devices as needed, and then easily error-proof the entire safety system prior to deployment.

# A Guide to Completing Your Safety System

- 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




Banner Safety Products with ISD

- **A** **ISD Connect**
  (Use to connect non-ISD devices to a chain)
- **B** **Illuminated E-Stops**
- **C** **RFID Safety Switches**
- **D** **SC10-2roe or XS26-ISDd Safety Controllers**

Connectors and Cordsets

1. **SI-RFA-P**
   Termination plug
2. **SI-RFA-TS**
   4-pin, 8-pin, 4-pin T-adapter for series ISD devices
3. **SI-RFA-TK**
   8-pin, 4-pin, 8-pin T-adapter for local reset button or power supply connection
4. **MQDEC-4xxSS**
   4-pin male/female M12 double-ended cable (straight to straight)
5. **DEE2R-8xxD**
   8-pin male/female M12 double-ended cable (straight to straight)
6. **MQDC-4xx**
   4-pin female M12 to flying lead cable
7. **MQDMC-5xx**
   5-pin female M12 to flying lead cable

## Safety Controllers

| Model* | Description | Industrial Ethernet | Inputs/ Convertible | Independently Controlled Safe Outputs | Max. Safety Output Rating |
|---|---|---|---|---|---|
| XS26-ISDd  | Base Controller  | ✓ | 26/8 | 2 | 0.5A PNP @24 V dc |
| XS8si  | Safety Input Module | | 8/2 | NA | NA |
| XS16si  | Safety Input Module | | 16/4 | NA | NA |
| XS2so  | Safety Output Module | | NA | 1 | 0.75A PNP @24 V dc |

| Model* | Description | Industrial Ethernet | Inputs/ Convertible | Independently Controlled Safe Outputs | Max. Safety Output Rating |
|---|---|---|---|---|---|
| XS4so  | Safety Output Module | | NA | 2 | 0.5A PNP @24 V dc |
| XS1ro  | Safety Relay Output Module | | NA | 1 | 6A; 2 NO, 1 NC aux |
| XS2ro  | Safety Relay Output Module | | NA | 2 | 6A; 2 NO, 1 NC aux |
| SC10-2roe  | Base Controller  | ✓ | 10/4 | 2 | 6A; 3 NO |

* Models operate at 24 V dc +/- 20%.

## RFID Safety Switches



Family: **SI-RF**

System Type: **D**
- **D** = Cascade with (ISD)

Reset: **T** —
- **T** = Automatic (Trip)
- **L** = Manual (Latch)

Coding*: **U**
- **L** = Low
- **H** = High
- **U** = Unique

Connector: **P8**
- **P8** = 250 mm pigtail, M12 8-pin QD

QD models require mating cordset

**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



Family: **SSA-EB1PL**
- **Illuminated E-Stop**

Color Armed: **Y**
- **X** = OFF
- **Y** = Yellow Solid
- **G** = Green Solid

Color Pressed: **R**
- **R** = Red Flashing

Shroud Option: [ ]
- **Blank** = None
- **S1** = Shroud

— Outputs: **0D**
- **0D** = OSSD Outputs with ISD

Enclosure Style: **ECQ8**
- **ECQ8** = 30 mm Round
- **ED1Q8** = Flush Mount Square

Reset: **R**
- **Blank** = Without Local Reset
- **R** = With Local Reset

## ISD Connect



Family: **SSA-ISD**
- **ISD Connect**

—

Device Input Type: **TC**
- **TC** = 2 NC Sets of Dry Contacts

Input Pin Configuration: **A**
- **A** = 5-pin Config A

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