Safety I/O Modules

І/О Туре	Cat. No.	Description	Page	
DC safety sinking input	5069-IB8S	1832V DC 8-point, safety sinking input module	82	
	5069-IB8SK	1832V DC 8-point, conformal coated safety sinking input module		
DC safety output	5069-0BV8S	1832V DC 8-point, safety output module that can be used as a Bipolar output module or sourcing output module	00	
	5069-0BV8SK	1832V DC 8-point, conformal coated safety output module that can be used as a Bipolar output module or sourcing output module	90	

5069-IB8S and 5069-IB8SK Safety Sinking Input Modules

When the module is wired as shown, it is suitable for applications that are rated up to, and including, Category 3 as defined in ISO 13849-1.

IMPORTANT: Remember the following:

- The switches are suitable for applications that are rated up to, and including, SIL CL3, PLe, Cat. 3.
- The light curtain is suitable for applications that are rated up to, and including, SIL CL3, PLe, Cat. 4.

Channel Connections

The diagram shows devices that are connected to safety input channels 0, 1, 6, and 7. You are not restricted to using only those channels.

You can connect devices to any safety input channel or combination of channels as needed.

SA Power

Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
- 5069-FPD field potential distributor

IMPORTANT: Remember the following:

- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You
 must connect DC power to the component, that is, controller,
 adapter, or field potential distributor, that provides SA Power to
 the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete the following steps.
- Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
- 2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
- 3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 4** as defined in ISO 13849-1. To achieve that suitability rating, you may have to perform diagnostic testing and monitoring of the safety function.

One diagnostic test method is to configure the safety input channel for Safety Pulse Test to test the circuit for short circuits to 24V DC. Safety input pairs must be associated with different Test Output sources.

Channel Connections

The diagram shows devices that are connected to safety input channels 0 and 1, and to test outputs 0 and 1. You are not restricted to using only those safety input channels. You can connect devices to any channel or combination of channels as needed.

SA Power

Connections to an external power supply that provides SA power via the SA Power RTB on one of the following:

- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter

• 5069-FPD field potential distributor

- **IMPORTANT**: Remember the following:
- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You must connect DC power to the component, that is, controller, adapter, or field potential distributor, that provides SA Power to the modules.
- If you install modules in a system that use AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
 - Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
 - 2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
- 3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.

IMPORTANT: When the power supply and muting lamp are configured for a test output, you much connect the return wire on the device to a COM point on the module.



When the module is wired as shown, and the requirements listed are met in the project of the safety controller, it is suitable for applications that are rated up to, and including, **Category 3** as defined in ISO 13849-1.

To achieve that suitability rating, you must meet the following requirements:

- Fault Exclusion is External Wiring fault.
- Use a SIL CL3, PLd, Cat. 3 qualified sensor.
- One of the following configuration combinations:
 - Input Point Mode = Safety Pulse Test
 - Test Output Mode = Pulse Test
 - Input Point Mode = Safety
 - Test Output Mode = Power Supply

Channel Connections

The diagram shows a device that is connected to safety input channel 0 and test output channel 0. You are not restricted to using only those channels.

You can connect devices to any safety input channel or combination of channels as needed.

We recommend that you connect even-numbered input points to even-numbered test output points and odd-numbered input points to odd-numbered test output points.

This wiring practice can maximize diagnostic independence and separation.



SA Power Connections to an external power supply that provides SA power via

- the SA Power RTB on one of the following:
- Compact GuardLogix 5380 controller
- 5069-AENTR or 5069-AEN2TR EtherNet/IP Adapter
 5069-FPD field potential distributor
- **IMPORTANT**: Remember the following:
- The 5069-IB8S and 5069-IB8SK modules use DC SA power. You
 must connect DC power to the component, that is, controller,
 adapter, or field potential distributor, that provides SA Power to
 the modules.
- If you install modules in a system that uses AC SA power and DC SA power, you must install them on separate SA power buses.
- You use a 5069-FPD field potential distributor to establish a new SA Power bus in a system. SA Power buses are isolated from each other. To keep the modules on separate SA Power buses, complete these steps.
- 1. Install the modules that use one type of SA power, for example DC, to the right of the adapter or controller, that is, the first SA Power bus.
- 2. Install the 5069-FPD field potential distributor to establish a second SA Power bus.
- 3. Install the modules that use the other type of SA power, for example AC, on the second SA Power bus.
- The SA Power to adjacent SA Power electrical isolation that the 5069-FPD field potential distributor provides has a rating of 240V AC (continuous) reinforced insulation type.







Technical Specifications - 5069-IB8S and 5069-IB8SK

Attribute	5069-IB8S, 5069-IB8SK	
Safety Inputs		
On-state voltage, min	10V DC	
On-state voltage, nom	24V DC	
On-state voltage, max	32V DC	
On-state current, min	1.8 mA	
On-state current, nom	2 mA	
On-state current, max	2.2 mA	
Off-state voltage, max	5V DC	
Off-state current, max	1.5 mA	
Input delay time		
Off to On	User selectable time: 0 ms50 ms Default is 0 ms	
On to Off	User selectable time: 0 ms50 ms Default is 0 ms	
Safety integrity Level (SIL)	SIL CL3, PLe, Cat. 4	
Safety reaction time (SRT)	6 ms	
Test Outputs		
Output current per channel, max	0.3 A	
Output current per group, max	1.2 A	
Output current per module, max	1.2 A	
Test output pulse width	< 700 µs	
Test output pulse period	< 100 ms	
Test output field capacitance, max	0.5 μF	
Test output short circuit protection	Yes	
Test output leakage current	1.5 mA	
Test output overvoltage protection ⁽¹⁾	Yes	
SA Power reverse voltage protection	Yes	
SA Power overvoltage protection, max	36.5V DC	
Timestamp of inputs	No	
CIP Sync™	Yes	
Overrides	No	
Pulse latching	No	
Events	No	
Pattern matching	No	
Extended counters	No	
Scheduled outputs	No	
Power consumption	3.8 W	

(1) Also known as Thermal Shutoff.

General Specifications - 5069-IB8S, 5069-IB8SK

Attribute	5069-IB8S, 5069-IB8SK	
Inputs	8 channels, safety sinking	
Test Outputs	2 test output channels 2 test output/muting output channels	
Voltage category	12/24V DC source	
Voltage and current ratings - System is mounted in Horizontal orientation		
Input Rating	2.5 mA per channel	
Test Output Rating	300 mA per channel	
MOD Power	75 mA @ 1832V DC	
MOD Power Passthrough, max ⁽¹⁾	5 A @ 1832V DC	
SA Power	100 mA@ 1832V DC	
SA Power Passthrough, max ⁽²⁾	9.95 A @ 1832V DC	
Voltage and current ratings - System is mounted in any orientation other than Horizontal (module de-rating) ⁽³⁾		
Input Rating	2.5 mA per channel	
Test Output Rating	200 mA per channel	
MOD Power	75 mA @ 1832V DC	
MOD Power Passthrough, max ⁽¹⁾	5 A @ 1832V DC	
SA Power	100 mA @ 1832V DC	
SA Power Passthrough, max ⁽²⁾	5 A @ 1832V DC	
Do not exceed 5 A MOD or SA Power Passthrough current draw in any orientation other than Horizontal.		
Power dissipation, max	3.5 W	
Thermal dissipation, max	4 W	
Isolation voltage	250V (continuous), Basic Insulation Type	
Module keying	Electronic module keying, software configurable	
Indicators	1 green/red module status indicator 1 green/red SA power status indicator 12 yellow/red I/O status indicators	

General Specifications - 5069-IB8S, 5069-IB8SK

Attribute	5069-IB8S, 5069-IB8SK	
Slot width	1	
Dimensions (HxWxD), approx	144.57 x 22 x 105.42 mm (5.69 x 0.87 x 4.15 in.)	
DIN rail	Compatible zinc-plated chromate-passivated steel DIN rail. You can use the EN50022 - 35 x 7.5 mm (1.38 x 0.30 in.) DIN rail.	
RTB	One of these RTB types. • 5069-RTB18-SPRING RTB • 5069-RTB18-SCREW RTB IMPORTANT : You must order RTBs separately. RTBs do not ship with Compact 5000 I/O modules. We recommend that you order only the RTB type that your system requires.	
RTB torque (5069-RTB18-SCREW RTB only)	0.4 N•m (3.5 lb•in)	
RTB keying	None	
Wire type	Copper	
Wire category ⁽⁴⁾	2 - signal ports 1 wire per terminal for each signal port	
Wire size		
5069-RTB18-SCREW removable terminal block	0.51.5 mm² (2216 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 3.5 mm (0.14 in.) max diameter including insulation	
5069-RTB18-SPRING removable terminal block	0.51.5 mm² (2216 AWG) solid or stranded copper wire rated at 105 °C (221 °F), or greater, 2.9 mm (0.11 in.) max diameter including insulation	
Insulation stripping length		
5069-RTB18-SCREW connections	12 mm (0.47 in.)	
5069-RTB18-SPRING connections	10 mm (0.39 in.)	
Weight, approx	175 g (0.39 lb)	
Enclosure type	None (open - style)	
North American temp code	Τ4	
ATEX temp code	Τ4	
IECEx temp code	Τ4	

(1) Level of MOD Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, <u>5069-UM001</u>, CompactLogix 5480 Controllers User Manual, <u>5069-UM002</u>, and Compact 5000 EtherNet/IP Adapters User Manual, <u>5069-UM004</u>.

(2) Level of SA Power current that passes through the module depends on the system configuration, such as, module slot location and the other module types that are used in the system. For more information, see the CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual, <u>5069-UM001</u>, CompactLogix 5480 Controllers User Manual, <u>5069-UM002</u>, and Compact 5000 EtherNet/IP Adapters User Manual, <u>5069-UM004</u>.

(3) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.

(4) Use this Conductor Category information for planning conductor routing. For more information, see the Industrial Automation Wiring and Grounding Guidelines, publication <u>1770-4.1</u> and the appropriate system-level installation manual.

Environmental Specifications - 5069-IB8S, 5069-IB8SK

Attribute	5069-IB8S, 5069-IB8SK
Temperature, operating IEC 60068-2-1 (Test Ab, Operating Cold), IEC 60068-2-2 (TestBb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40+85 °C (-40+185 °F)
Temperature, surrounding air, max.	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) $^{(1)}$	50 °C (122 °F)
Temperature, ambient, max	
System is mounted in Horizontal orientation	60 °C (140 °F)
System is mounted in any orientation other than Horizontal (module de-rating) $^{(1)}$	50 °C (122 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	595% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	4.5 g @ 10500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	15 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	20V/m with 1 kHz sine-wave 80% AM from 802000 MHz 20V/m with 200 Hz 50% pulse 100% AM at 900 MHz 20V/m with 200 Hz 50% pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 20002700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	\pm 1 kV line-line (DM) and \pm 2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz80 MHz
Voltage variation IEC 61000-4-29	10 ms interruption on DC supply ports

(1) The additional supported mounting orientations are Inverted Horizontal, Vertical, Inverted Vertical, Upside Down, and Upside Up.

Certifications - 5069-IB8S, 5069-IB8SK

Certification ⁽¹⁾	5069-IB8S, 5069-IB8SK
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	 European Union 2014/30/EU EMC Directive, compliant with: EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/42/EC MD, compliant with: EN 60204-1; Electrical equipment of machines EN ISO 13849-1; Safety-related parts of control systems EN 62061; Functional safety of safety-related control systems Cat. 4/PLe according to EN ISO 13849-1, and SIL 3 according to EN 626011/IEC 61508/IEC 62511 European Union 2011/65/EU RoHS, compliant with: EN 50581; Technical documentation
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • Ex nA IIC T4 Gc • DEMKO 18 ATEX 2019X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • Ex nA IIC T4 Gc • IECEx UL 18.0014X
TÜV	TÜV Certified for Functional Safety; ⁽²⁾ • Capable of SIL 3, CAT. 4/PLe
КС	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

(2) When used with specified firmware revisions. See the Product Safety Certificate at http://www.rockwellautomation.com/global/certification/overview.page for a full list of safety-related certifications.