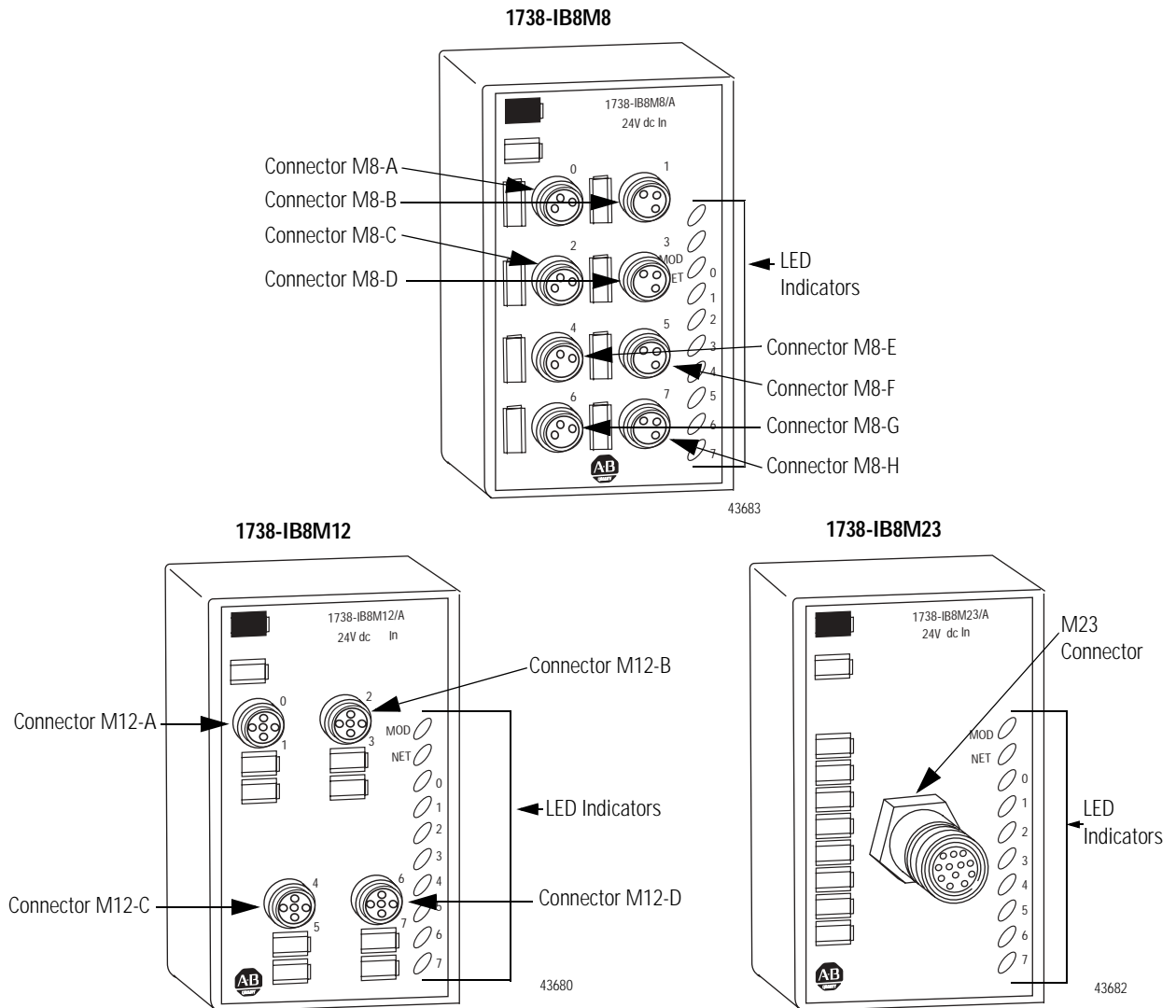# ArmorPoint 24V dc Input Modules, Series A

Cat. Nos. 1738-IB2M12, -IB4M8, -IB4M12, -IB8M8, -IB8M12, -IB8M23, -IV4M12, -IV8M8, -IV8M12, -IV8M23

The ArmorPoint™ I/O family consists of modular I/O modules. The sealed IP67 housing of these modules requires no enclosure. (Note that environmental requirements other than IP67 may require an additional appropriate housing.) I/O connectors are sealed M8 (pico), M12 (micro) or M23 styles. The mounting base ships with the module.

1738-IB8M8

Connector M8-A
Connector M8-B
Connector M8-C
Connector M8-D
LED Indicators
Connector M8-E
Connector M8-F
Connector M8-G
Connector M8-H

1738-IB8M8/A
24V dc In

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1738-IB8M12

1738-IB8M12/A
24V dc In

Connector M12-A
Connector M12-B
LED Indicators
Connector M12-C
Connector M12-D

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1738-IB8M23

1738-IB8M23/A
24V dc In

M23 Connector
LED Indicators

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Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.ab.com/manuals/gi) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc. is prohibited.

Throughout this manual we use notes to make you aware of safety considerations.

WARNING	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you: • identify a hazard • avoid a hazard • recognize the consequence
SHOCK HAZARD	Labels may be located on or inside the equipment to alert people that dangerous voltage may be present.
SHOCK HAZARD	Labels may be located on or inside the equipment to alert people that surfaces may be dangerous temperatures.

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ATTENTION

⚠

Environment and Enclosure

This equipment is intended for use in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "enclosed" equipment. It should not require additional system enclosure when used in locations consistent with the enclosure type ratings stated in the Specifications section of this publication. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings, beyond what this product provides, that are required to comply with certain product safety certifications.

NOTE: See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

ATTENTION

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Preventing Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, store the equipment in appropriate static-safe packaging.
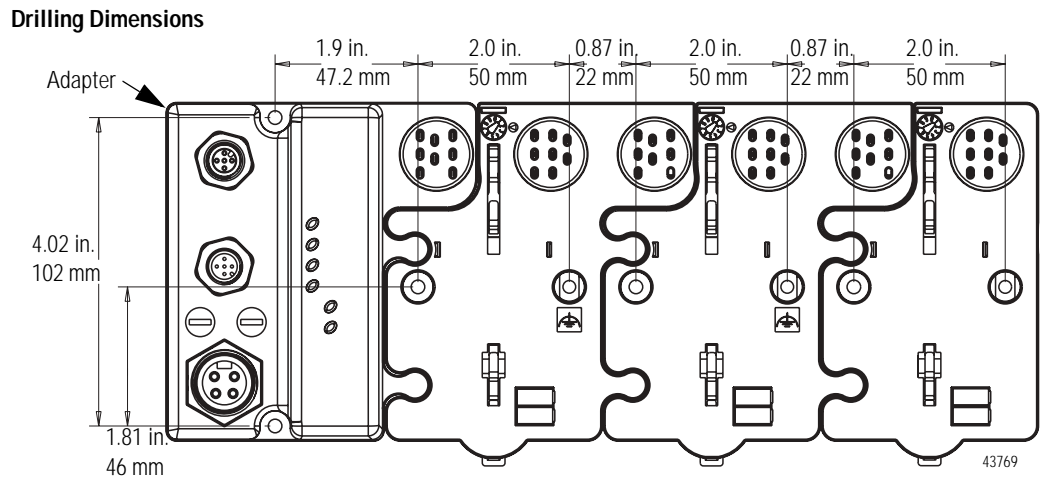
Mount the I/O Base

To mount the base on a wall or panel, use the screw holes provided in the base.

IMPORTANT	The module must be mounted on a grounded metal mounting plate or other conductive surface.

A drilling dimensions mounting illustration for the base with an adapter is shown below.

Drilling Dimensions


Install the mounting base as follows:

1. Lay out the required points as shown in the drilling dimension drawing.

2. Drill the necessary holes for #8 (M4) machine or self-tapping screws.

3. Mount the base using #8 (M4) screws.

4. Ground the system using the ground lug connection. (The ground lug connection is also a mounting hole.)
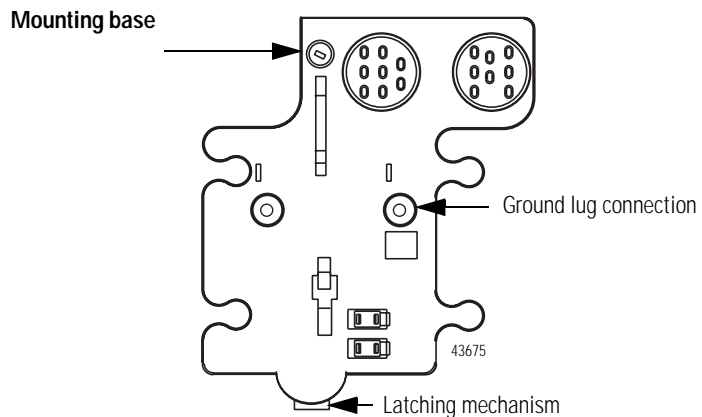
Install the Digital Input Module

To install the digital input module:

1. Using a bladed screwdriver, rotate the keyswitch on the mounting base clockwise until the number 1 aligns with the notch in the base.

2. Position the module vertically above the mounting base. The module will bridge two bases.

Module will bridge two bases.
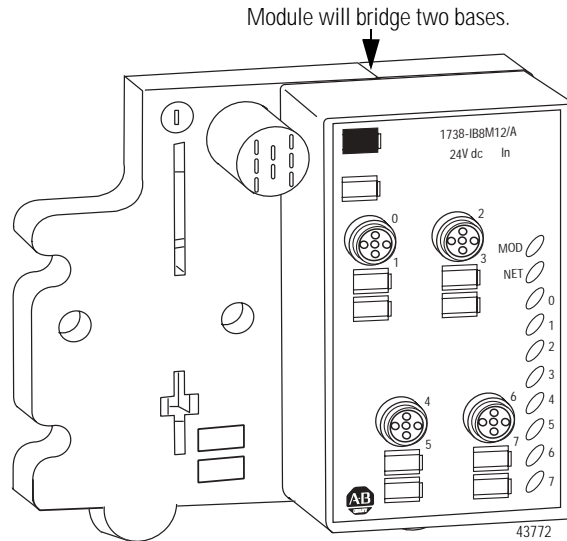
3. Push the module down until it engages the latching mechanism. You will hear a clicking sound when the module is properly engaged.

The locking mechanism will lock the module to the base.

Remove the Module From the Mounting Base

To remove the module from the mounting base:

1. Put a flat blade screwdriver into the slot of the orange latching mechanism.

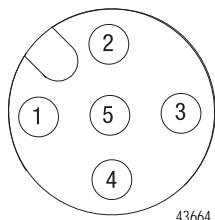**2.** Push the screwdriver toward the module to disengage the latch.

The module will lift up off the base.

3. Pull the module off of the base.

Wire the Modules

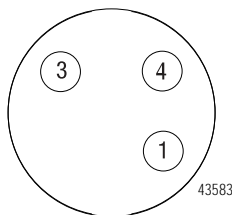Following are wiring instructions for the modules.

### 1738-IB2M12, 1738-IB4M12, and 1738-IV4M12

(view into connector)
Pin 1 - 24V dc
Pin 2 - No Connect
Pin 3 - Common
Pin 4 - Input 0 (M12-A)
          Input 1 (M12-B)
          Input 2 (M12-C) (1738-IB4M12 and 1738-IV4M12 modules only)
          Input 3 (M12-D) (1738-IB4M12 and 1738-IV4M12 modules only)
Pin 5 - No Connect

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1738-IB4M8, 1738-IB8M8, and 1738-IV8M8

(view into connector)
Pin 1 - 24V dc
Pin 3 - Common
Pin 4 - Input 0 (M8-A)
           Input 1 (M8-B)
           Input 2 (M8-C)
           Input 3 (M8-D)
           Input 4 (M8-E) (1738-IB8M8 and 1738-IV8M8 modules only)
           Input 5 (M8-F) (1738-IB8M8 and 1738-IV8M8 modules only)
           Input 6 (M8-G) (1738-IB8M8 and 1738-IV8M8 modules only)
           Input 7 (M8-H) (1738-IB8M8 and 1738-IV8M8 modules only)

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1738-IB8M12 and 1738-IV8M12
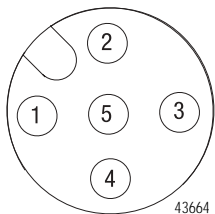
(view into connector)
Pin 1 - 24V dc

Pin 2 - Input 1 (M12-A)	Pin 4 - Input 0 (M12-A)
Input 3 (M12-B)	Input 2 (M12-B)
Input 5 (M12-C)	Input 4 (M12-C)
Input 7 (M12-D)	Input 6 (M12-D)
Pin 3 - Common	Pin 5 - No Connect

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1738-IB8M23 and 1738-IV8M23
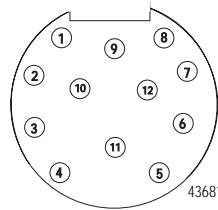
(view into connector)

Pin 1 - Input 0   Pin 7 - Input 6
Pin 2 - Input 1   Pin 8 - Input 7
Pin 3 - Input 2   Pin 9 - Return (Com)
Pin 4 - Input 3   Pin 10 - Return (Com)
Pin 5 - Input 4   Pin 11 - 24V dc
Pin 6 - Input 5   Pin 12 - Chassis

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ATTENTION	Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP67 requirements.

Communicate With Your Module

I/O messages are sent to (consumed) and received from (produced) the modules. These messages are mapped into the processor's memory. These modules produce 1 byte of input data (scanner Rx - status). They do not consume I/O data (scanner Tx).

Default Data Map for the Modules

1738-IB2M12 Module

Message size: 1 Byte

	7	6	5	4	3	2	1	0	
Produces (Rx)	Not Used						Ch1	Ch0	Channel status
Where: 0 = off, 1 = on									

1738-IB4M8, -IB4M12, and -IV4M12 Modules

Message size: 1 Byte

	7	6	5	4	3	2	1	0	
Produces (Rx)	Not Used				Ch3	Ch2	Ch1	Ch0	Channel status
Where: 0 = off, 1 = on									

1738-IB8M8, -IB8M12, -IB8M23, -IV8M8, -IV8M12, and -IV8M23 Modules

Message size: 1 Byte

	7	**6**	**5**	**4**	**3**	**2**	**1**	**0**	
Produces (Rx)	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1	Ch0	Channel status
Where: 0 = off, 1 = on									

Troubleshoot With the Indicators

1738-IB8M12

1738-IB8M12/A
24V dc   In

Module Status Indicators
Network Status Indicators

I/O Status Indicators

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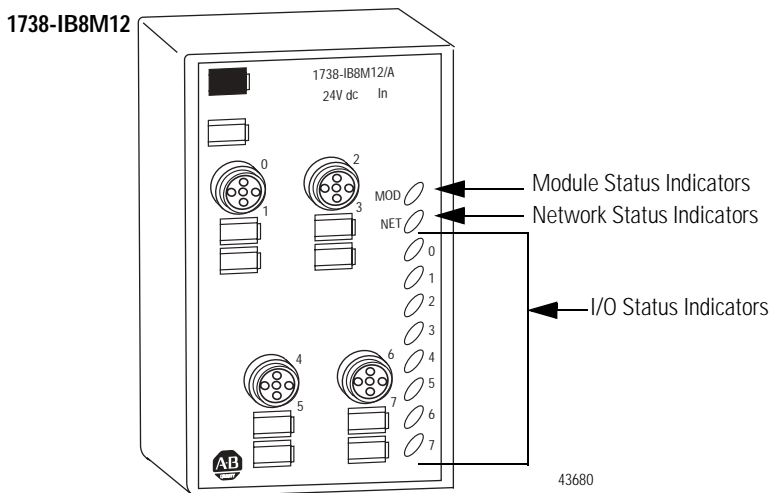
Indication	**Probable Cause**
Module Status	
Off	No power applied to device
Green	Device operating normally
Flashing Green	Device needs commissioning due to missing, incomplete, or incorrect configuration
Flashing Red	Recoverable fault
Red	Unrecoverable fault - may require device replacement
Flashing Red/Green	Device is in self-test

Indication	Probable Cause
Network Status	
Off	Device is not on line: - Device has not completed dup_MAC_ID test. - Device not powered - check module status indicator.
Flashing Green	Device is on line but has no connections in the established state.
Green	Device is on line and has connections in the established state.
Flashing Red	One or more I/O connections in timed-out state.
Red	Critical link failure - failed communication device. Device detected error that prevents it from communicating on the network.
Flashing Red/Green	Communication faulted device - the device has detected a network access error and is in communication faulted state. Device has received and accepted an Identity Communication Faulted Request - long protocol message.

Indication	Probable Cause
I/O Status	
Off	Input is in the off state
Yellow	Input on

Specifications

Following are specifications for the 1738 ArmorPoint digital input modules.

ArmorPoint Digital Input Modules	
Inputs per Module	1738-IB2 - 2 (1 group of 2) nonisolated, sinking 1738-IB4 - 4 (1 group of 4) nonisolated, sinking 1738-IV4 - 4 (1 group of 4) nonisolated, sourcing 1738-IB8 - 8 (1 group of 8) nonisolated, sinking 1738-IV8 - 8 (1 group of 8) nonisolated, sourcing
Voltage, Off-State Input, Maximum	5V dc
Voltage, On-State Input, Maximum Minimum Nominal	 28.8V dc 10V dc 24V dc
Current, Off-State Input, Maximum	1.5 mA
Current, On-State Input, Maximum Minimum Nominal	 5 mA 2 mA 4 mA @ 24V dc
Input Impedance, Maximum Nominal	 4.7 kΩ 3.6 kΩ
Input Delay Time OFF to ON	0.5 ms hardware + (0-63 ms selectable[1])

ArmorPoint Digital Input Modules	
Input Delay Time, ON to OFF	0.5 ms hardware + (0-63 ms selectable[1])
Input Point Density	2, 4, or 8
Field Power Bus Supply Voltage Range, Nominal	10-28.8V dc 24V dc
Keyswitch Position	1
General Specifications	
LED Indicators	2, 4, or 8 yellow input status, logic side 1 green/red network status, logic side 1 green/red module status, logic side
PointBus Current, Maximum	75 mA @ 5V dc
Power Dissipation, Maximum	1738-IB2 - 0.7W @ 28.8V dc 1738-IB4 and -IV4 - 1.0W @ 28.8V dc 1738-IB8 and -IV8 - 1.6W @ 28.8V dc
Thermal Dissipation, Maximum	1738-IB2 - 2.4 BTU/hr. @ 28.8V dc 1738-IB4 and -IV4 - 3.4 BTU/hr. @ 28.8V dc 1738-IB8 and -IV8 - 5.5 BTU/hr. @ 28.8V dc
Isolation Voltage (continuous-voltage withstand rating)	50V rms Tested at 1250V ac rms for 60s
Dimensions (includes I/O module Inches and mounting base) (Millimeters)	4.72H x 2.83W x 1.65D (120H x 72W x 42D)
Operating Temperature	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20 to 60°C (-4 to 140°F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Un-packaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Un-packaged Non-operating Dry Heat), -40 to 85°C (-40 to 185°F)
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5-95% non-condensing
Shock	IEC60068-2-27 (Test Ea, Unpackaged Shock): Operating 30g Non-operating 50g
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz
ESD Immunity	IEC 61000-4-2: 6kV contact discharges 8kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 2000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900Mhz 10V/m with 200Hz 50% Pulse 100%AM at 1890Mhz
EFT/B Immunity	IEC 61000-4-4: ±3kV at 5kHz on signal ports
Surge Transient Immunity	IEC 61000-4-5: ±1kV line-line(DM) and ±2kV line-earth(CM) on signal ports
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80MHz

General Specifications (continued)

Emissions	CSPR 11: Group 1, Class A
Enclosure Type Rating	Meets IP65/66/67 (when marked)
Mounting Base Screw Torque	#8 screw, 7.5 in. lbs. in Aluminum, 16 in. lbs. in Steel
Weight Imperial (Metric)	0.64 lb. (0.29 kg)
Wiring Category[2]	1 - on signal ports
Certifications:[3] (when product is marked)	c-UL-us UL Listed Industrial Control Equipment, certified for US and Canada
	CE European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity
	C-Tick Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions

1. Input OFF to ON or ON to OFF delay is time from a valid input signal to recognition by the module.

2. Use this Conductor Category information for planning conductor routing. Refer to Publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines".

3. See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned:

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

ArmorPoint is a trademark of Rockwell Automation.

www.rockwellautomation.com