



## *Installation Instructions*

# **POINT I/O 120Vac Input Module**

Catalog Numbers 1734-IA2, 1734-IA4, Series C

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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://literature.rockwellautomation.com>) 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.

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

<b>WARNING</b> 	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.
<b>IMPORTANT</b>	Identifies information that is critical for successful application and understanding of the product.
<b>ATTENTION</b> 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you to identify a hazard, avoid a hazard, and recognize the consequences.
<b>SHOCK HAZARD</b> 	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
<b>BURN HAZARD</b> 	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

## North American Hazardous Location Approval

<p><b>The following information applies when operating this equipment in hazardous locations.</b></p>	<p><b>Informations sur l'utilisation de cet équipement en environnements dangereux.</b></p>		
<p>Products marked CL I, DIV 2, GP A, B, C, D are suitable for use in Class I Division 2 Groups A, B, C, D, hazardous locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.</p>	<p>Les produits marqués CL I, DIV 2, GP A, B, C, D ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.</p>		
<p><b>WARNING</b></p> 	<p><b>EXPLOSION HAZARD -</b></p> <ul style="list-style-type: none"> <li>• Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.</li> <li>• Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.</li> <li>• Substitution of components may impair suitability for Class I, Division 2.</li> <li>• If this product contains batteries, they must only be changed in an area known to be nonhazardous.</li> </ul>	<p><b>AVERTISSEMENT</b></p> 	<p><b>RISQUE D'EXPLOSION –</b></p> <ul style="list-style-type: none"> <li>• Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.</li> <li>• Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.</li> <li>• La substitution de composants peut rendre cet équipement inadéquat à une utilisation en environnement de Classe 1, Division 2.</li> <li>• S'assurer que l'environnement est classé non dangereux avant de changer les piles.</li> </ul>

**ATTENTION**



This product is grounded through the DIN rail to chassis ground. Use zinc plated, yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials, such as aluminum and plastic that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.87 in.) and use end-anchors appropriately.

### Environment and Enclosure

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**ATTENTION**

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters (6562 feet) 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 open-type equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

Besides this publication, see:

- Industrial Automation Wiring and Grounding Guidelines, for additional installation requirements, Allen-Bradley publication 1770-4.1.
  - NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.
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## Prevent Electrostatic Discharge

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**ATTENTION**

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.
  - Use a static-safe workstation, if available.
  - Store the equipment in appropriate static-safe packaging when not in use.
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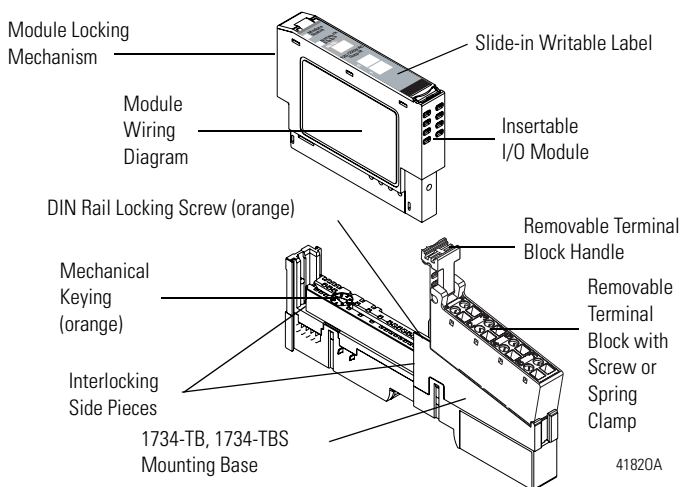
## Before You Begin

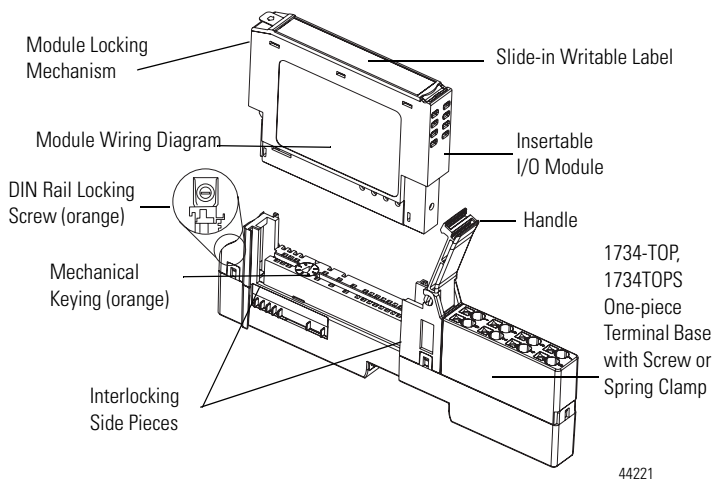
Note that this series C product can be used with the following:

- DeviceNet and PROFIBUS adapters
- ControlNet and EtherNet/IP adapters, using RSLogix 5000 software, version 11 or later

See the figures to familiarize yourself with major parts of the module, noting that the wiring base assembly consists of one of the following:

- 1734-TB or 1734-TBS POINT I/O two-piece terminal base, which includes the 1734-RTB removable terminal block
- 1734-TOP or 1734-TOPS POINT I/O single-piece terminal base

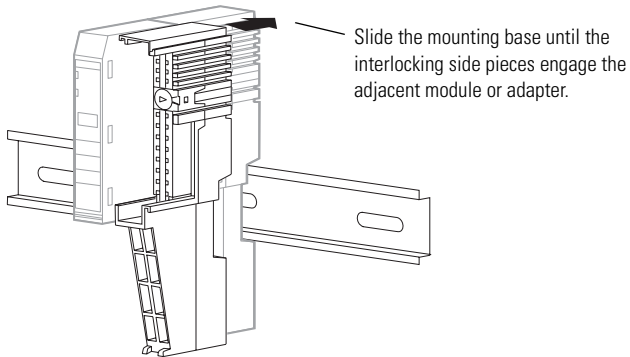




## Install the Mounting Base

To install the mounting base on the DIN rail, proceed as follows.

1. Position the mounting base vertically above the installed units (adapter, power supply, or existing module).



31586

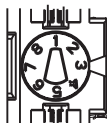
2. Slide the mounting base down so that the interlocking side pieces engage the adjacent module or adapter.
3. Press firmly to seat the mounting base on the DIN rail so that the mounting base snaps into place.



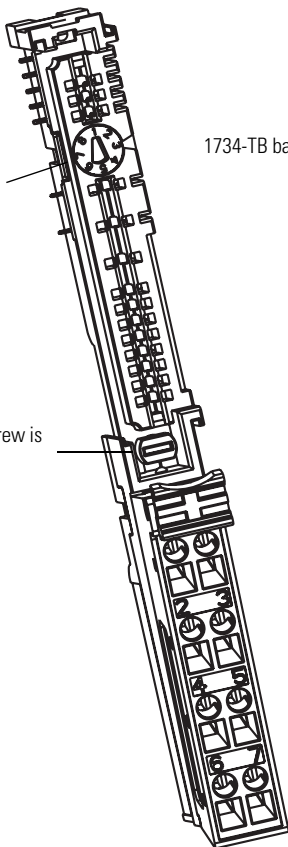
## Install the Module

The module can be installed before or after base installation. Make sure that the mounting base is correctly keyed before installing the module into the mounting base. In addition, make sure the mounting base locking screw is positioned horizontally with reference to the base.

Turn the keyswitch to align the number with the notch. Notch position 3 is shown.



Be sure the DIN-rail locking screw is in the horizontal position.



1734-TB base is shown.

44229

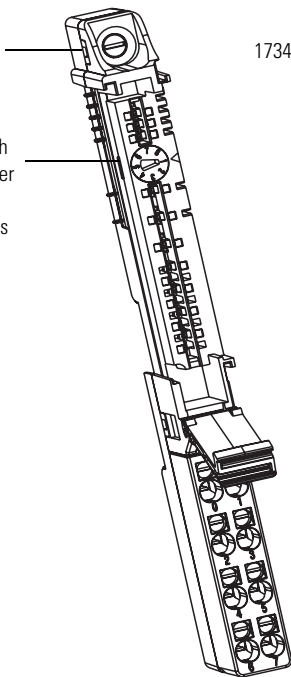
## 10 POINT I/O 120V ac Input Module

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Be sure the DIN-rail locking screw is in the horizontal position.

Turn the keyswitch to align the number with the notch. Notch position 1 is shown.

1734-TOP base is shown.



44228

**WARNING**

When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

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1. Using a bladed screwdriver, rotate the keyswitch on the mounting base clockwise until the number required for the type of module being installed aligns with the notch in the base.
2. Make certain the DIN-rail locking screw is in the horizontal position, noting that you cannot insert the module if the locking mechanism is unlocked.
3. Insert the module straight down into the mounting base and press to secure so that the module locks into place.

### **Install the Removable Terminal Block (RTB)**

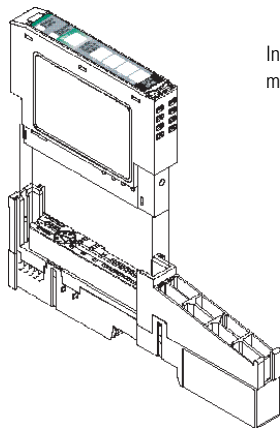
A removable terminal block (RTB) is supplied with your wiring base assembly. To remove, pull up on the RTB handle. You can remove and replace without removing any of the wiring. To reinsert the RTB, proceed as follows.

1. Insert the end opposite the handle into the base unit, noting that this end has a curved section that engages with the wiring base.
2. Rotate the terminal block into the wiring base until it locks itself in place.

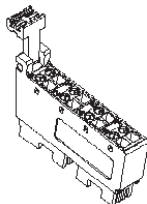
## 12 POINT I/O 120V ac Input Module

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3. If an I/O module is installed, snap the RTB handle into place on the module.



Insert the module straight down into the mounting base.



Hook the RTB end into the mounting base end and rotate until it locks into place.

44011

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**WARNING**

When you connect or disconnect the removable terminal block (RTB) with field-side power applied, an electrical arc can occur. This can cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

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## Remove a Mounting Base

To remove a mounting base, you must remove any installed module and the module installed in the base to the right. Remove the removable terminal block (RTB), if wired.

1. Unlatch the RTB handle on the I/O module.
2. Pull on the RTB handle to remove the RTB.

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**WARNING**

When you connect or disconnect the removable terminal block (RTB) with field-side power applied, an electrical arc can occur. This can cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding.

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3. Press on the module lock on the top of the module
  4. Pull on the I/O module to remove it from the base.

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**WARNING**

When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Be sure that power is removed or the area is nonhazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

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## 14 POINT I/O 120V ac Input Module

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5. Repeat steps 1...4 for the module to the right.
6. Use a small-bladed screwdriver to rotate the orange base-locking screw to a vertical position to release the locking mechanism.
7. Lift straight up to remove.

### Wire the Module

To wire the module, refer to the figures and tables.

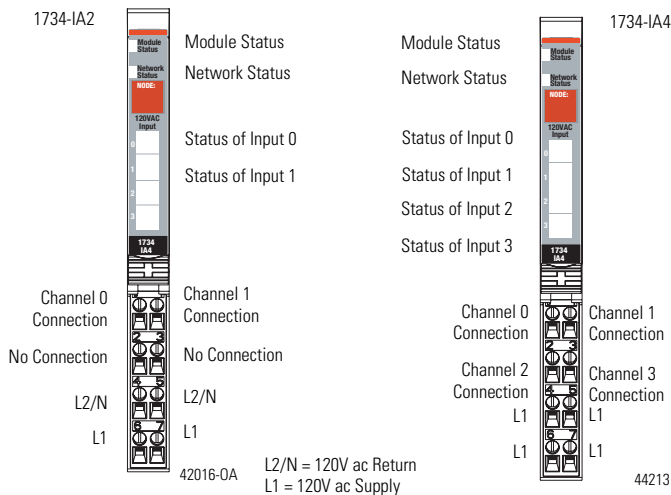
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**WARNING**

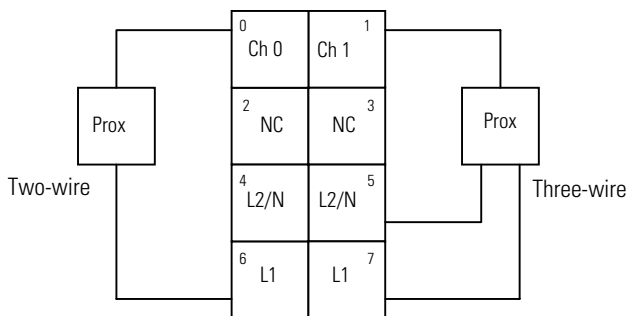
If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

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## Wire the Module



## Catalog Number 1734-IA2



Ch 0 = Channel 0 Input  
 NC = No Connection  
 L1 = 120V ac

Ch 1 = Channel 1 Input  
 L2/N = 120V ac Neutral

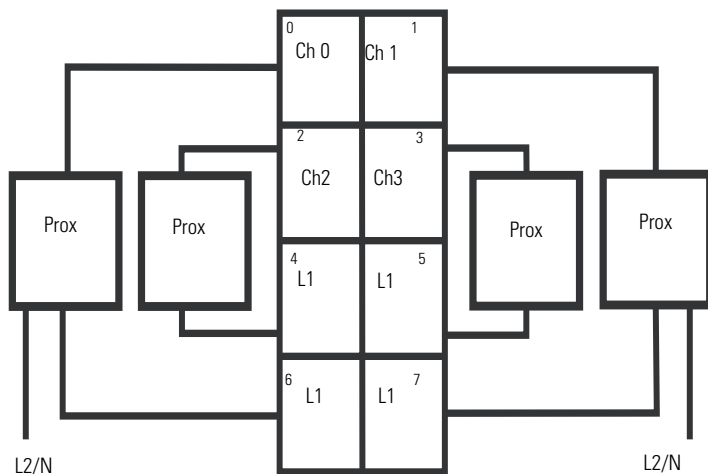
41966B

Channel	Input Terminal	Return	Supply
0	0	4	6
1	1	5	7

Module power is supplied from the internal power bus.



## Catalog Number 1734-IA4



Ch0 = Channel 0 Input

Ch1 = Channel 1 Input

Ch2 = Channel 2 Input

Ch3 = Channel 3 Input

L2/N = 120V ac Neutral

L1 = 120V ac

44230

Channel	Input Terminal	Common Terminal	Power
0	0		4
1	1		5
2	2		6
3	3		7

Module power is supplied from the internal power bus.

## Communicating with the Module

I/O messages are sent to (consumed) and received from (produced) the POINT I/O modules. These messages are mapped into the processor's memory. This POINT I/O input module produces 1 byte of input data (scanner Tx) (state). It does not consume data (scanner Rx).

Refer to the table that shows the default data map.

### Default Data Map for 1734-IA2 Modules - Message Size: 1 Byte

	7	6	5	4	3	2	1	0
Produces (scanner Rx)							Ch1	Ch0
Consumes (scanner Tx)	No consumed data							

Where: Ch0 = channel 0, Ch1 = channel 1, 0 = Off, 1 = On

### Default Data Map for 1734-IA4 Modules

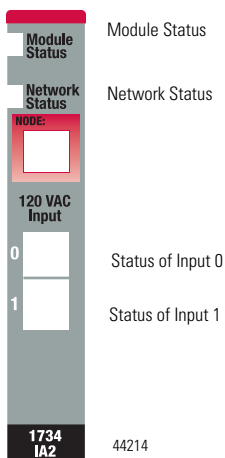
	7	6	5	4	3	2	1	0
Produces (scanner Rx)					Ch3	Ch2	Ch1	Ch0
Consumes (scanner Tx)	No consumed data							

Where: Ch0 = channel 0, Ch1 = channel 1, Ch2 - channel 2, Ch3 = channel 3  
0 = Off, 1 = On

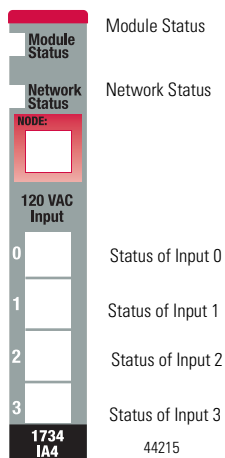
## Interpret the LED Indicators

See the figures and tables for information about how to interpret LED indicators.

### 1734-IA2



### 1734-IA4



## Interpret the LED Indicators

State	Description	Recommended Action
Module Status		
Off	No power applied to device.	Apply power to device.
Green	Device operating normally.	None.
Flashing Green	Device needs commissioning due to configuration missing, incomplete, or incorrect.	Configure device properly.
Flashing Red	Recoverable fault.	1. Cycle power to device. 2. If condition persists, replace device.

**Interpret the LED Indicators**

<b>State</b>	<b>Description</b>	<b>Recommended Action</b>
Red	Unrecoverable fault may require device replacement.	Replace device.
Flashing Red/Green	Device is in self-test.	None.
<b>Network Status</b>		
Off	Device is not online. - Device has not completed dup_MAC_id test. - Device not powered - check module status indicator.	Apply power to device, wait for MAC_id to complete, and correct, as needed.
Flashing Green	Device is online but has no connections in the established state.	None - device is in Idle or Program mode.
Green	Device online and has connections in the established state.	None.
Flashing Red	One or more I/O connections in timed-out state.	Check for I/O module failure, and correct, as needed.
Red	Critical link failure - failed communication device. Device detected error that prevents it from communicating on the network.	Verify that adapter and terminal bases are properly installed, and reinstall, as needed.
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 Identify Communication Faulted Request - long protocol message.	Verify that adapter is properly installed, and reinstall, as needed.
<b>I/O Status</b>		
Off	Input is in the off-state.	None.
Yellow	Input is in the on-state.	None.

## Specifications

### 1734-IA2 and 1734-IA4 120V ac Input Module

Attribute	Value
Number of Inputs	1734-IA2 - 2 (1 group of 2) nonisolated, sinking 1734-IA4 - 2 (1 group of 4) nonisolated, sinking
On-state Voltage Range, Min	65V ac
On-state Voltage Range, Nom	120V ac
On-state Voltage Range, Max	132V ac
On-state Current, Min	4.0 mA @ 65V ac, 60 Hz
On-state Current, Nom	7.5 mA @ 120V ac, 60 Hz
On-state Current, Max	8.5 mA @ 132V ac, 60 Hz
Off-state Voltage, Max	43V ac
Off-state Current, Max	2.7 mA @ 43V ac
Input Impedance, Nom	10.6 k $\Omega$
Delay Time <sup>(1)</sup> Off to On and On to Off	20 ms hardware filter plus 1...64 ms digital filter programmable in increments of 1 ms
Keyswitch Position	8

<sup>(1)</sup> Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off filter time is the time from the input signal dropping below the valid level to recognition by the module. Due to the randomness of the ac line-cycle measurement capture point and response time of the hardware filter, the maximum hardware delay is 20 ms plus the filter time.

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### General

Attribute	Value
Module Location	1734-TB, 1734-TBS, 1734-TOP, or 1734-TOPS wiring base assembly
POINTBus Current, Max	75 mA @ 5V dc
Power Dissipation, Max	0.1 W @ 132V ac
Thermal Dissipation, Max	3.4 BTU @ 132V ac
Isolation Voltage	240V, Reinforced Insulation Type Tested at 3250 V dc for 60 s, field-side to system
External ac Power Supply Voltage, Nom	120V ac, 60 Hz
External ac Power Supply Voltage Range	85...132V dc, 47...63 Hz
Dimensions (HxWxD), Approx.	56.0 x 12.0 x 75.5 mm (2.21 x 0.47 x 2.97 in.)
Conductor Category	1 - on signal ports <sup>(1)</sup>
Wire Size	0.25... 2.5 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 75 °C (167 °F) or greater 1.2 mm (3/64 in.) insulation max
Weight, Approx	30.9 g (1.09 oz)
North American Temp Code	T4A
Enclosure Type Rating	None (open-style)
Terminal Base Screw Torque	0.8 Nm (7 lb-in)

<sup>(1)</sup> Use this conductor category information for planning conductor routing as described in Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 .

## Environmental Specifications

Attribute	Value
Temperature, Operating	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...55 °C (-4...131 °F)
Temperature, Storage	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)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% noncondensing
Shock, Operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, Nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g at 10...500 Hz
ESD Immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80%AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100%AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100%AM at 1890 MHz 3V/m with 1 kHz sine-wave 80%AM from 2000...2700 MHz
Conducted RF Immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80%AM from 150 kHz...80 MHz
EFT/B Immunity	IEC 61000-4-4: ±4 kV at 5 kHz on signal ports
Surge Transient Immunity	IEC 61000-4-5: ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Emissions	CISPR 11 Group 1, Class A

## Certifications

Certification	Value	
Certifications (when product is marked) <sup>(1)</sup>	c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584 UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810
	CE	European Union 89/336/EEC EMC Directive, compliant with: EN 50082-2; Industrial Immunity EN 61326; 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 and B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
	C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions

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

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Publication 1734-IN010C-EN-E - January 2007

PN 953030-59

Supersedes publication 1734-IN010B-EN-P - April 2002

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