Installation Instructions

Allen-Bradley

POINT I/O 220V AC Input Module

Catalog numbers 1734-IM2, 1734-IM4, 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://www.rockwellautomation.com/literature/) 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.

	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.
	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 and recognize the consequences.
	SHOCK HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.
	BURN HAZARD: Labels may be on or inside the equipment (for example, drive or motor) to alert people that surfaces may reach dangerous temperatures.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Environment and Enclosure

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.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Preventing Electrostatic Discharge

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 wrist strap.
- 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.

North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:	**Informations sur l'utilisation de cet équipement en environnements dangereux:**
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.	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.
EXPLOSION HAZARD • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • 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. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.	**RISQUE D'EXPLOSION** • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • 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. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc plated, yellow-chromate steel DIN rail to be sure of proper grounding. The use of other DIN rail materials, such as aluminum and plastic, which 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.

About the Module

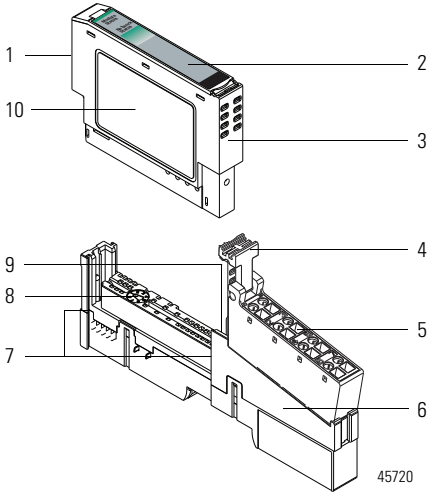
Note that this series C product can be used with the following:

- 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 is one of the following:

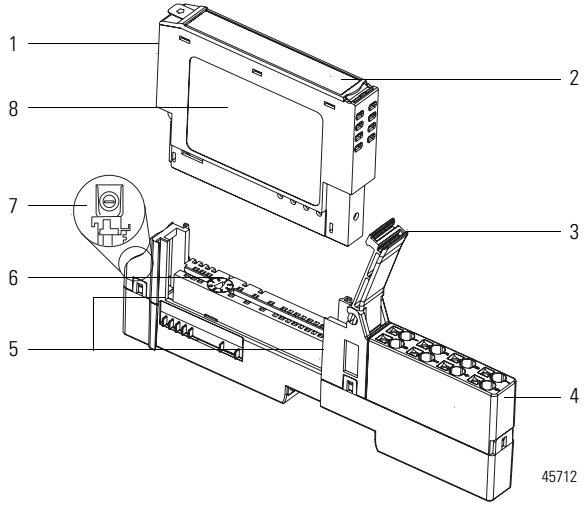
- 1734-TB or 1734-TBS POINT I/O two-piece terminal base, which includes the 1734-RTB removable terminal block
- 1734-TOP or 1734-TOPS POINT I/O one-piece terminal base

Modules Mounted on Removable Terminal Block and Mounting Base



	Description		Description
1	Module locking mechanism	6	Mounting base
2	Slide-in writable label	7	Interlocking side pieces
3	Insertable I/O module	8	Mechanical keying
4	Removable Terminal Block handle	9	DIN rail locking screw (orange)
5	Removable Terminal Block (RTB)	10	Module wiring diagram

Modules Mounted on 1734-TOP or 1734-TOPS One-piece Terminal Base

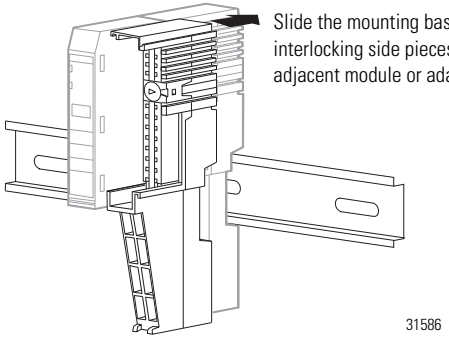


	Description		Description
1	Module locking mechanism	5	Interlocking side pieces
2	Slide-in writable label	6	Mechanical keying
3	Handle	7	DIN rail locking screw (orange)
4	1734-TOP or 1734-TOPS one-piece terminal base with screw or spring clamp	8	Module wiring diagram

Mount the I/O Base

To mount the I/O base on the DIN rail (Allen-Bradley part number 199-DR1; 46277-3; EN50022), proceed as follows:

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



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

Install the Module

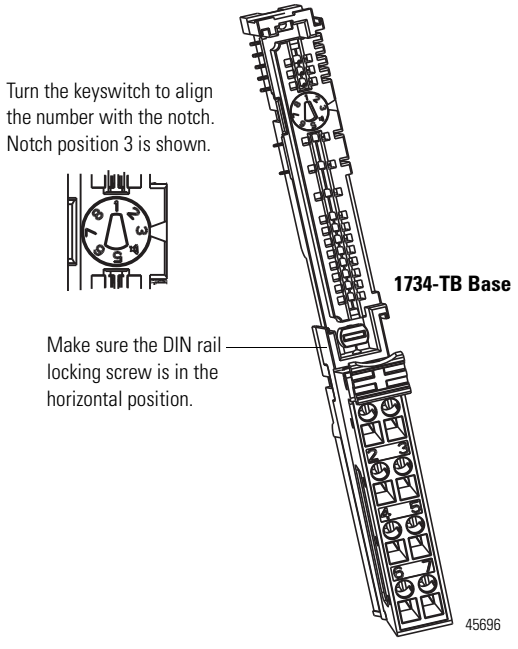
The module can be installed before or after base installation. Make sure that the mounting base is correctly keyed before installing the module into the mounting base. In addition, make sure the mounting base locking screw is positioned horizontal in reference to the base.

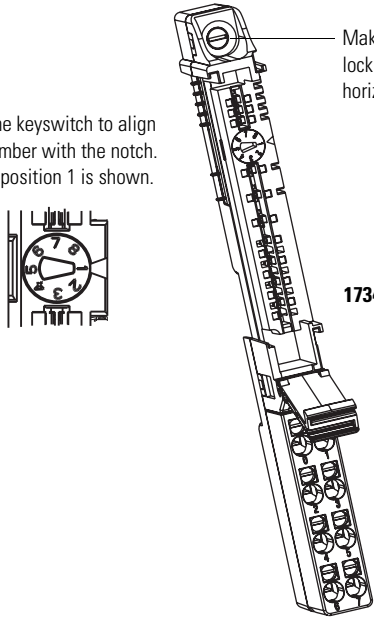
WARNING: When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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.

1. Using a bladed screwdriver to 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. 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. The module locks into place.

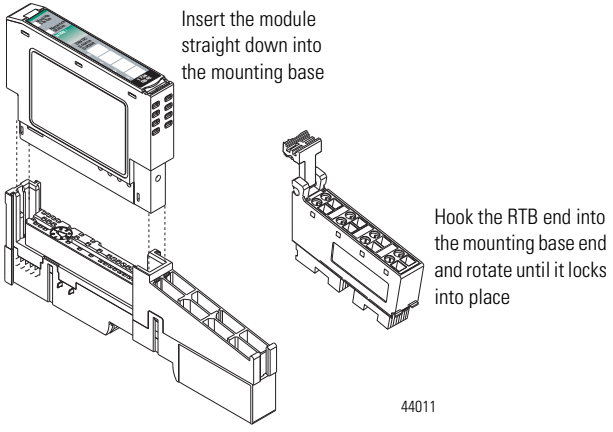



Make sure the DIN-rail locking screw is in the horizontal position.
Turn the keyswitch to align the number with the notch. Notch position 1 is shown.
1734-TOP Base
45697

Install the Removable Terminal Block

A Removable Terminal Block (RTB) is supplied with your wiring base assembly. To remove, pull up on the RTB handle. This allows the mounting base to be removed and replaced as necessary without removing any of the wiring. To reinsert the Removable Terminal Block, proceed as follows:

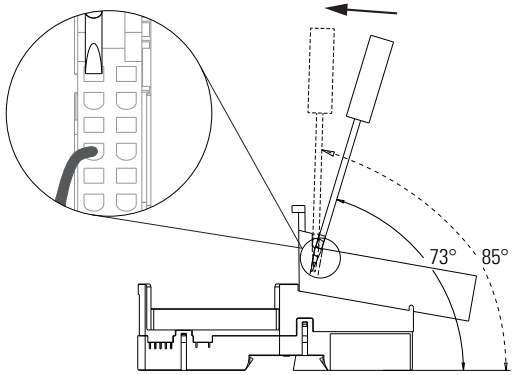
1. Insert the end opposite the handle into the base unit. This end has a curved section that engages with the wiring base.
2. Rotate the terminal block into the wiring base until it locks itself in place.
3. If an I/O module is installed, snap the RTB handle into place on the module.



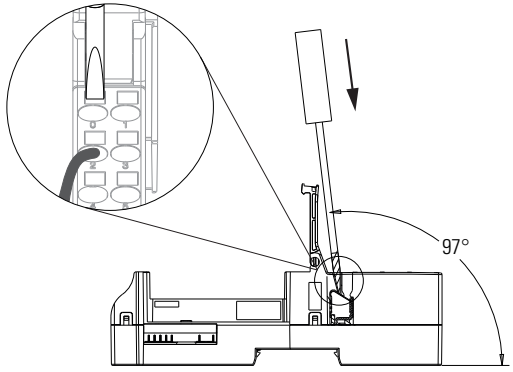
WARNING: When you connect or disconnect the Removable Terminal Block (RTB) with field side power applied, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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

WARNING: For 1734-RTBS and 1734-RTB3S, to latch and un-latch the wire, insert a bladed screwdriver (catalog number 1492-N90 – 3 mm diameter blade) into the opening at approximately 73° (blade surface is parallel with top surface of the opening) and push up gently.



WARNING: For 1734-TOPS and 1734-TOP3S, to latch and un-latch the wire, insert a bladed screwdriver (catalog number 1492-N90 – 3 mm diameter) into the opening at approximately 97° (blade surface is parallel with top surface of the opening) and press in (do not push up or down).



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, if wired.

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

WARNING: When you connect or disconnect the Removable Terminal Block (RTB) with field side power applied, 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.

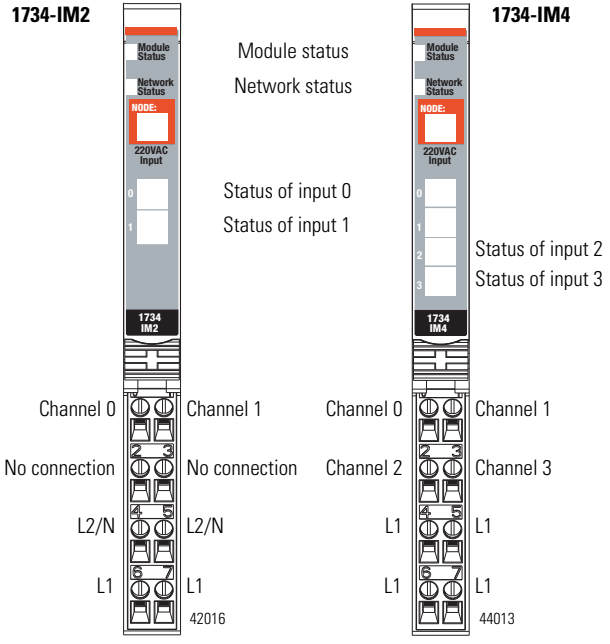
3. Press on the module lock on the top of the module.
4. Pull on the I/O module to remove from the base.

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.

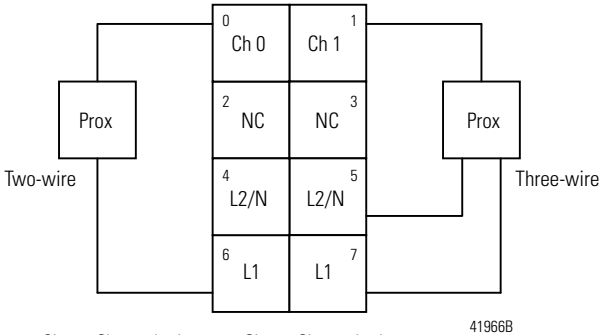
5. Repeat steps 1, 2, 3 and 4 for the module to the right.
6. Use a small bladed screwdriver to rotate the orange base locking screw to a vertical position. This releases the locking mechanism.
7. Lift straight up to remove.

Wire the Module



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.

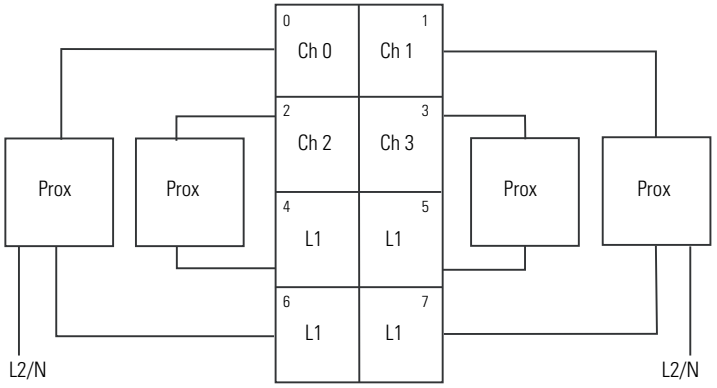
Catalog Number 1734-IM2



Ch 0 = Channel 0 Input
Ch 1 = Channel 1 Input
NC = No Connection
L2/N = 220V AC Neutral
L1 = 220V AC

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-IM4



Ch0 = Channel 0 Input
Ch1 = Channel 1 Input
Ch2 = Channel 2 Input
Ch3 = Channel 3 Input
L2/N = 220V AC Neutral
L1 = 220V AC

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

Module power is supplied from the internal power bus.

Use an external neutral bus or a 1734-CTM module for AC (220V) neutral connections, if required.

Communicate with Your Module

I/O messages are sent to (consumed) and received from (produced) the POINT I/O modules. These messages are mapped onto 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).

Default Data Map for 1734-IM2

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-IM4

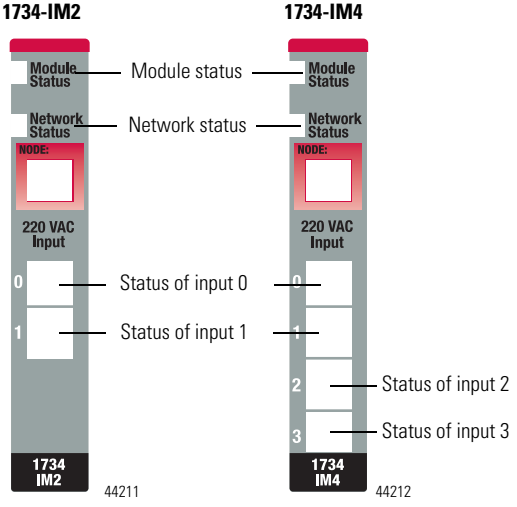
Message size: 1 Byte

	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 Status Indicators

Refer to the following diagram and table for information on how to interpret the status indicators.



Indicator Status for Modules

State	Description	Recommended Action
Module status		
Off	No power applied to device.	Apply power to device.
Solid green	Device operating normally.	None.
Flashing green	Device needs commissioning due to missing, incomplete, or incorrect configuration.	Configure device properly.
Flashing red	Recoverable fault.	1. Cycle power to device. 2. If condition persists, replace device.
Solid red	Unrecoverable fault may require device replacement.	Replace device.
Flashing red/green	Device is in self-test mode.	None.

Indicator Status for Modules

State	Description	Recommended Action
Network status		
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 dup_MAC-id test 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.
Solid green	Device is online and has connections in the established state.	None.
Flashing red	One or more I/O connections are in timed-out state.	Check for I/O module failure, and correct, as needed.
Solid 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 Identity Communication Faulted Request – long protocol message.	Verify that adapter is properly installed, and reinstall, as needed.
I/O status		
Off	Input is in the off-state.	None.
Solid yellow	Input is in the on-state.	None.

Specifications

220V AC Input Modules – 1734-IM2 and 1734-IM4

Attribute	Value
Number of inputs	**1734-IM2** – 2 (1 group of 2) nonisolated, sink **1734-IM4** – 4 (1 group of 4) nonisolated, sink
On-state voltage range, min	159V AC
On-state voltage range, nom	220V AC
On-state voltage range, max	264V AC
On-state current, min	6.2 mA @ 159V AC, 60 Hz
On-state current, nom	8.5 mA @ 220V AC, 60 Hz
On-state current, max	10.2 mA @ 264V AC, 60 Hz
Off-state voltage, max	43V AC
Off-state current, max	2.9 mA
Input impedance, nom	22.3 kΩ
Delay time[1] Off to On and On to Off	20 ms hardware filter plus 1…65.535 ms digital filter programmable in increments of 1 ms
Keyswitch position	8

(1) 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.

General Specifications

Attribute	Value
Module location	1734-TB, 1734-TBS, 1734-TOP, or 1734-TOPS
POINTBus current, max	75 mA @ 5V DC
Power dissipation, max	**1734-IM2** – 0.48 W @ 264V AC **1734-IM4** – 0.80 W @ 264V AC
Thermal dissipation, max	**1734-IM2** – 1.63 BTU/hr @ 264V AC **1734-IM4** – 2.73 BTU/hr @ 264V AC
Isolation voltage	240V (continuous), type tested @ 3250V DC for 60 s, field-side to system
External AC power supply voltage, nom	220V AC, 60 Hz
External AC power supply voltage range	159…264V AC, 47…63 Hz
Dimensions (HxWxD), approx.	56.0 x 12.0 x 75.5 mm (2.21 x 0.47 x 2.97 in.)
Wiring category[1]	1 – on signal ports
Wire size	0.25…2.5 mm^2 (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)

(1) 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
Vibration	IEC 60068-2-6, (Test Fc, Operating): 5 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	CISPR 11 Group 1, Class A
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 MHz…2000 MHz 10V/m with 200 Hz 50% pulse 100%AM @ 900 MHz 10V/m with 200 Hz 50% pulse 100%AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80%AM from 2000…2700 MHz
EFT/B immunity	IEC 61000-4-4: ±4 kV @ 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
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80%AM @ 150 kHz…80 MHz

Certifications

Certification (when product is marked)[1]	Value
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 2014/30/EU EMC Directive, compliant with: 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 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation
RCM	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) See the Product Certification link at http://www.rockwellautomation.com/products/certification/ for Declaration 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://www.rockwellautomation.com/support/, 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://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem 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 product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation 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, follow these procedures.

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

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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