



Installation Instructions

POINT I/O 2 Current and 2 Voltage Input Analog Modules

Catalog Numbers 1734-IE2C and 1734-IE2V, Series C

Inside...

For This Topic	See Page
Important User Information	2
Environment and Enclosure	3
Preventing Electrostatic Discharge	4
Before You Begin	4
Identify Module Components	5
Install the Mounting Base	6
Install the Module	7
Install the Removable Terminal Block (RTB)	8
Remove a Mounting Base	9
Communicate with Your Module	10
Wire the Module	11
Troubleshoot with Indicators	14
North American Hazardous Location Approval	17
European Hazardous Location Approval	18
Specifications	19

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.

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

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.
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: <ul style="list-style-type: none">• identify a hazard• avoid a hazard• recognize the consequence
 SHOCK HAZARD	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.
 BURN HAZARD	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.

ATTENTION**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 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 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.

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

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.
-

Before You Begin

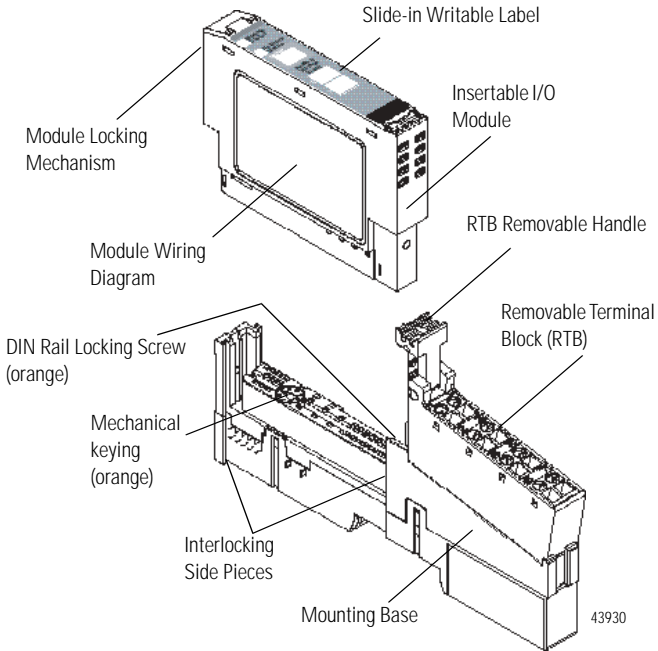
Read this manual for information about how to install the following modules.

- 1734-IE2C, Series C, POINT I/O Current Input Analog Module
- 1734-IE2V, Series C, POINT I/O Voltage Input Analog Module

You can use these Series C modules with DeviceNet and PROFIBUS adapters. If you are using RSLogix 5000 software version 11 or higher, you can also use these Series C modules with ControlNet and Ethernet adapters.

Identify Module Components

Use the figures to identify the external features of the modules.



Wiring Base Assembly is Terminal Base 1734-TB or 1734-TBS
(Mounting Base 1734-MB and Removable Terminal Block 1734-RTB or 1734-RTBS).

Install the Mounting Base

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

ATTENTION



POINT I/O is grounded through the DIN rail to chassis ground. Use zinc-plated, yellow-chromated steel DIN rail to assure proper grounding. The use of DIN rail materials (e.g., aluminum, plastic, etc.) 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.

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

The mounting base will snap into place.

ATTENTION



Do not discard the end cap shipped with an adapter or communication interface module. Use this end cap to cover the exposed interconnections on the last mounting base on the DIN rail. Failure to do so could result in equipment damage or injury from electric shock.

Install the Module

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.

Install the module before or after base installation. Make sure that you:

- correctly keyed the mounting base before installing the module into the mounting base
- positioned the mounting base locking screw horizontal with reference to the base

To install the module, proceed as follows.

1. Using a bladed screwdriver, rotate the keyswitch on the mounting base clockwise until the number required for the type of module you are installing 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 will lock into place.

Install the Removable Terminal Block (RTB)

A removable terminal block comes with your wiring base assembly. To remove, pull up on the RTB handle. You can now remove the mounting base and replace 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.

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.

- Use a small-bladed screwdriver to rotate the orange base locking screw to a vertical position.

This releases the locking mechanism.

- Lift straight up to remove.

Communicate with Your Module

POINT I/O modules send (consume) and receive (produce) I/O messages. You map these messages into the processor's memory.

This POINT I/O input module produces 6 bytes of input data (scanner Rx) and fault status data. It does not consume I/O data (scanner Tx).

Default Data Map Message size: 6 Bytes

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Produces (scanner Rx)	Input Channel 0 - High Byte								Input Channel 0 - Low Byte							
	Input Channel 1 - High Byte								Input Channel 1 - Low Byte							
	Status Byte for Channel 1								Status Byte for Channel 0							
	O R	U R	H H A	L L A	H A	L A	C M	C F	O R	U R	H H A	L L A	H A	L A	C M	C F
Consumes (scanner Tx)	No consumed data															

Where: CF = Channel Fault status; 0 = no error, 1 = fault
 CM = Calibration Mode; 0 = normal, 1 = calibration mode
 LA = Low Alarm; 0 = no error, 1 = fault
 HA = High Alarm; 0 = no error, 1 = fault
 LLA = Low/Low Alarm; 0 = no error, 1 = fault
 HHA = High/High Alarm; 0 = no error, 1 = fault
 UR = Underrange; 0 = no error, 1 = fault
 OR = Overrange; 0 = no error, 1 = fault

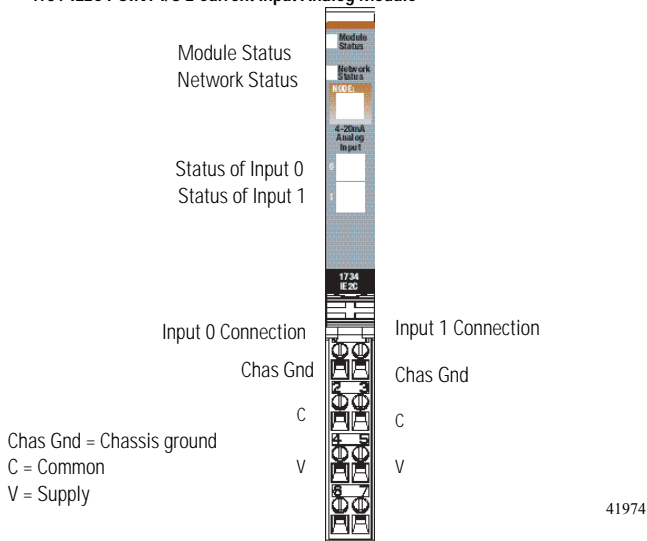
Wire the Module

WARNING



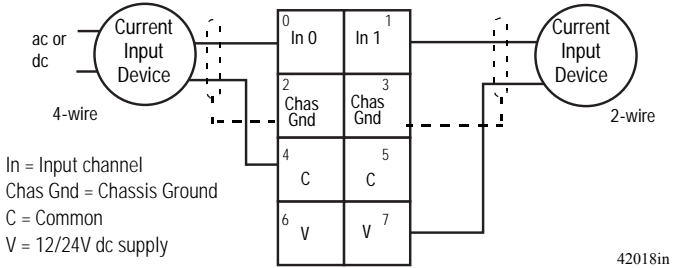
If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

1734-IE2C POINT I/O 2 Current Input Analog Module



12 POINT I/O 2 Current and 2 Voltage Input Analog Modules

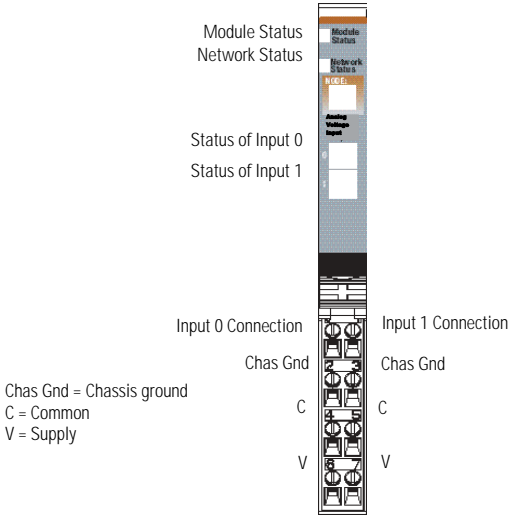
1734-IE2C POINT I/O 2 Current Input Analog Module



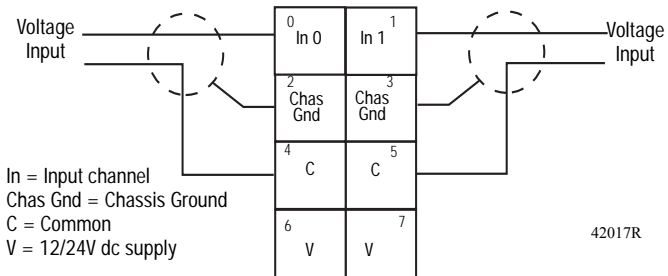
Channel	Current Input	Chassis Ground	Common	Supply
0	0	2	4	6
1	1	3	5	7

12/24V dc is provided by the internal field power bus.

1734-IE2V POINT I/O 2 Voltage Input Analog Module



1734-IE2V POINT I/O 2 Voltage Input Analog Module



14 POINT I/O 2 Current and 2 Voltage Input Analog Modules

Channel	Voltage Input	Chassis Ground	Common	Supply
0	0	2	4	6
1	1	3	5	7

12/24V dc is provided by the internal field power bus.

Troubleshoot with Indicators

Use the status indicators to troubleshoot your module.

1734-IE2C
POINT I/O 2 Current
Input Analog Module



Module Status
 Network Status

 Status of Input 0
 Status of Input 1

1734-IE2V
POINT I/O 2 Voltage
Input Analog Module



Module Status
 Network Status

 Status of Input 0
 Status of Input 1

41974



Indication	Probable Cause
Module Status	
Off	No power applied to device
Green	Device operating normally
Flashing Green	Device needs commissioning due to configuration missing, incomplete or incorrec.
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 online - Device has not completed dup_MAC_id test. - Device not powered - check module status indicator
Flashing Green	Device is online but has no connections in the established state
Green	Device online 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 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 Identify Communication Faulted Request - long protocol message.

16 POINT I/O 2 Current and 2 Voltage Input Analog Modules

Indication	Probable Cause
Channel Status	
Off	Module in CAL mode
Solid Green	Normal (channel scanning inputs)
Flashing Green	Channel being calibrated
Solid Red	No power or major channel fault
Flashing Red	Channel at end of range (0mA or 21mA) for 1734-IEC2C Channel at end of range (over or under) for 1734-IE2V

North American Hazardous Location Approval

<p>The following information applies when operating this equipment in hazardous locations:</p>	<p>Informations sur l'utilisation de cet équipement en environnements dangereux:</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>WARNING</p> 	<p>EXPLOSION HAZARD -</p> <ul style="list-style-type: none"> • 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.
<p>AVERTISSEMENT</p> 	<p>RISQUE D'EXPLOSION -</p> <ul style="list-style-type: none"> • 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.

European Hazardous Location Approval

European Zone 2 Certification (The following applies when the product bears the EEx marking)

This equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/EC.

DEMKO certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to this Directive.

The examination and test results are recorded in confidential report No 03NK30347.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 50021.

IMPORTANT

Observe the following additional Zone 2 certification requirements.

- This equipment is not resistant to sunlight or other sources of UV radiation.
 - The secondary of a current transformer shall not be open-circuited when applied in Class I, Zone 2 environments.
 - Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Zone 2 environments.
 - This equipment shall be used within its specified ratings defined by Allen-Bradley.
 - Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40% when applied in Class I, Zone 2 environments.
-

Specifications

Input Specifications	1734-IE2C	1734-IE2V
Number of Inputs	2 single-ended, non-isolated	
Input Resolution, Bits	16 bits - over 0-21mA 0.32 μ A/cnt	15 bits plus sign 320 μ V/cnt in unipolar or bipolar mode
Input Current	4-20mA 0-20mA	-
Input Voltage	-	0-10V (user configurable) (-0.0V under, +0.5V over) \pm 10V user configurable (-0.5V under, +0.5V over)
Absolute Accuracy ¹ Current or Voltage Input	0.1% Full Scale @ 25°C	
Accuracy Drift w/Temp. Current or Voltage Input	30ppm/°C	5ppm/°C
Input Update Rate (per module)	100ms @ Notch = 60Hz (default) 120ms @ Notch = 50Hz 24ms @ Notch = 250Hz 12ms @ Notch = 500Hz	
Input Step Response (per channel)	70ms @ Notch = 60Hz (default) 80ms @ Notch = 50Hz 16ms @ Notch = 250Hz 8ms @ Notch = 500Hz	
Digital Filter Time Constant	0...10,000ms (default = 0ms)	
Input Impedance	60 Ω	100K Ω
Input Resistance	60 Ω	200k Ω
Conversion Type	Delta Sigma	
Common Mode Rejection Ratio	120dB	

20 POINT I/O 2 Current and 2 Voltage Input Analog Modules

Input Specifications (continued)	1734-IE2C	1734-IE2V
Normal Mode Rejection Ratio	-60dB -3db Notch filter 15.7Hz @ Notch = 60Hz 13.1Hz @ Notch = 50Hz 65.5Hz @ Notch = 250Hz 131Hz @ Notch = 500Hz	
Data Format	Signed integer	
Maximum Overload	Fault protected to 28.8V dc	
Calibration	Factory calibrated	

General Specifications	1734-IE2C	1734-IE2V
Module Location	1734-TB or 1734-TBS wiring base assembly	
POINTBus Current	75mA @5V dc	
Power Dissipation	0.6W maximum @28.8V dc	0.75W maximum @ 28.8V dc
Thermal Dissipation	2.0 BTU/hr maximum @ 28.8V dc	2.5 BTU/hr maximum @ 28.8V dc
Isolation Voltage (continuous-voltage withstand rating)	50V continuous Tested to withstand 2550V dc for 60s No isolation between individual channels	50 V continuous Tested to withstand 2200V dc for 60s No isolation between individual channels
External dc power Supply Voltage Voltage Range Supply Current	24V dc nominal 10...28.8V dc 10mA @ 24V dc	24V dc nominal 10...28.8V dc 15mA @ 24V dc

General Specifications (continued)	1734-IE2C	1734-IE2V
Indicators	1 green/red network status indicator, logic side 1 green/red module status indicator, logic side 2 green/red input status indicators, logic side	
Keyswitch Position	3	
Dimensions Inches (Millimeters)	2.21H x 0.47W x 2.97L (56H x 12W x 75.5L)	
Operational 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...55°C (-4...131°F)	
Storage Temperature	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 Nonoperating Damp Heat): 5...95% noncondensing	
Vibration	IEC60068-2-6 (Test Fc, Operating) 5g @ 10-500Hz	
Shock Operating Non-Operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30g peak acceleration 50g peak acceleration	
Emissions	CISPR 11: Group 1, Class A	

22 POINT I/O 2 Current and 2 Voltage Input Analog Modules

General Specifications (continued)	1734-IE2C	1734-IE2V
ESD Immunity	IEC6100-4-2: 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 5.0 kHz on signal ports	
Surge Transient Immunity	IEC 61000-4-5: ±2kV line-earth(CM) on shielded ports	
Conducted RF Immunity	IEC61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80 MHz	
Enclosure Type Rating	None (open-style)	
Wire Size	14 AWG (2.5mm ²) - 22 AWG (0.25mm ²) solid or stranded copper wire rated at 75°C or greater 3/64 inch (1.2mm) insulation maximum	
Wire Category ²	1 on signal ports	
Terminal Base Screw Torque	0.6 Nm (7 lb-in)	
Weight	0.035 kg (0.08 lb)	

Certification ³ (when product is marked)	1734-IE2C	1734-IE2V
c-UL-us UL Listed Industrial Control Equipment, certified for U.S. and Canada	X	
c-UL-us UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada	X	X
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	X	X
C-Tick Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11, Industrial Emissions	X	X
EEx European Union 94/9/EC ATEX Directive, compliant with: EN 50021; Potentially Explosive Atmospheres, Protection "n" (Zone 2)	X	X

- 1 Includes offset, gain, non-linearity and repeatability error terms.
- 2 Use this Category information for planning routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
- 3 See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

POINT and POINTBus are trademarks of Rockwell Automation.
ControlNet is a trademark of ControlNet International, Ltd.
DeviceNet is a trademark of the Open DeviceNet Vendor Association.

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.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1734-IN027A-EN-E - May 2005

PN 957955-35

Supersedes Publication 1734-IN001B-EN-P - April 2002
and 1734-IN053C-EN-P - April 2002

Copyright © 2005 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.