



Installation Instructions

ControlLogix DH-485 Communications Module

Catalog Number(s) 1756-DH485

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About this Publication

Use this document to install the ControlLogix DH-485 communications module.

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.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.

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 to identify a hazard, avoid a hazard and recognize the consequences.
SHOCK HAZARD 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
BURN HAZARD 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that surfaces may be dangerous temperatures.

Environment and Enclosure

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 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.

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 Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 for additional installation requirements pertaining to this equipment.

Prevent 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 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.
-

Removal and Insertion Under Power

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.

Single-point Serial Communication Connections

WARNING





If you connect or disconnect the serial cable with power applied to this module or the serial device on the other end of the cable, 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.

North American Hazardous Location Approval

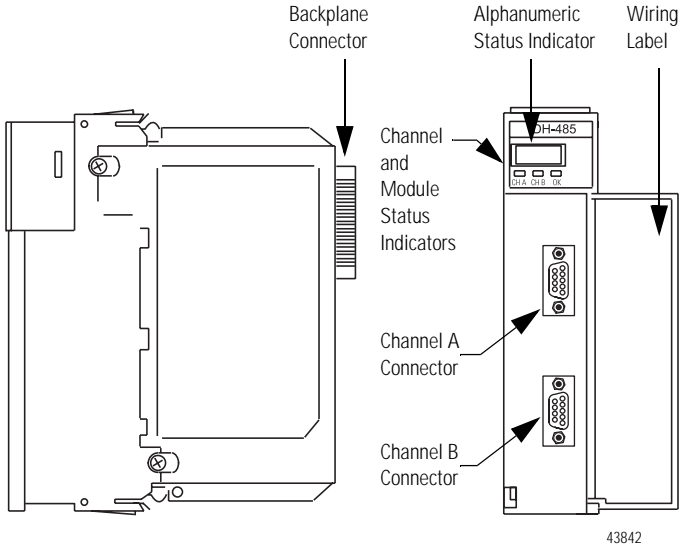
The following information applies when operating this equipment in hazardous locations:	Informations sur l'utilisation de cet équipement en environnements dangereux:
<p>Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous 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>

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

Identify Module Features

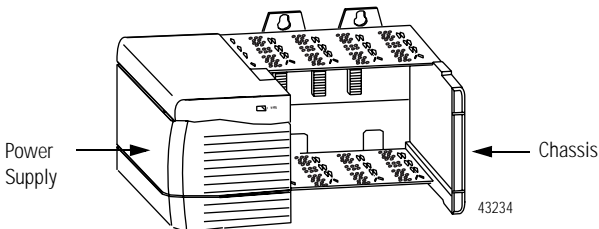
Use this figure to identify module hardware components.

Module Features



Prepare the Chassis for Module Installation

Before you install the 1756-DH485 module, you must install and connect a ControlLogix chassis and power supply.



For information on installing these products, refer to the publications listed in the table Power Supply.

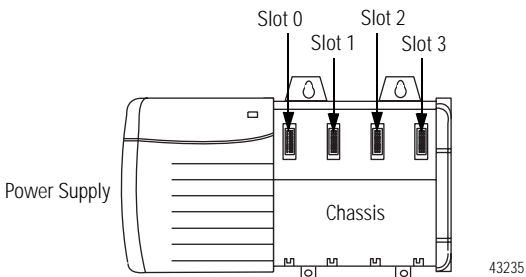
Power Supply

Chassis Type	Chassis	Power Supply	Power Supply
Series B: 1756-A4, -A7, -A10, -A13, -A17	1756-IN080	1756-PA72	1756-IN078
		1756-PB72	
		1756-PA75	1756-IN596
		1756-PB75	

Determine Module Slot Location

Figure Slot Locations shows chassis slot numbering in a four-slot chassis. Slot 0 is the first slot and is always the leftmost slot in the rack (the first slot to the right of the power supply). You can use any size ControlLogix chassis and install the module in any slot. You can also install multiple 1756-DH485 modules in the same chassis. You can install as many modules as your power supply can accommodate (that is the number for which the power supply is rated).

Slot Locations



Install or Remove the Module While Power Is Applied

You can install or remove the module while chassis power is applied if you observe the following precautions.

WARNING



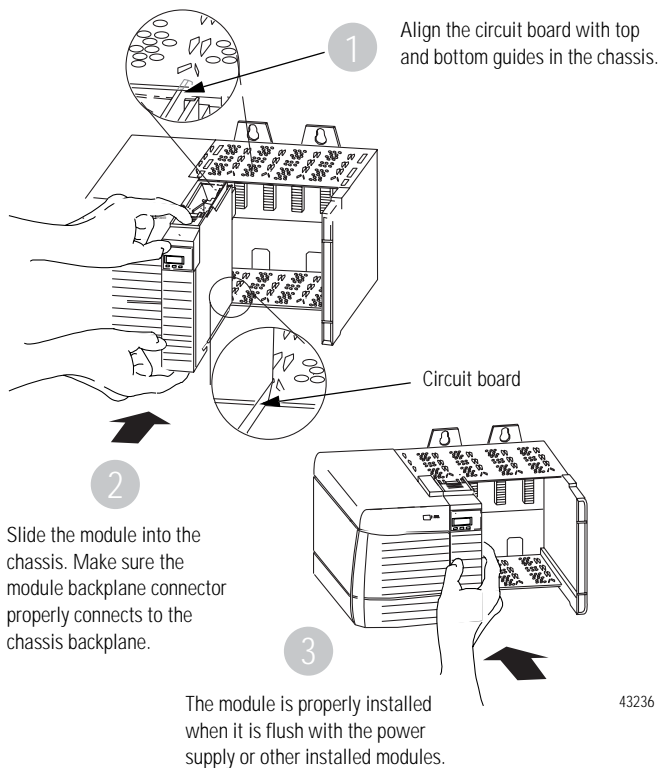
When you insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

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.

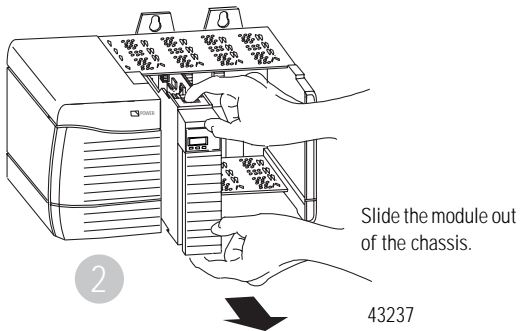
Install the Module

ATTENTION

Do not force the module into the backplane connector. If you cannot seat the module with firm pressure, check the alignment. Forcing the module into the chassis can damage the backplane connector or the module.



Remove or Replace the Module (When Applicable)



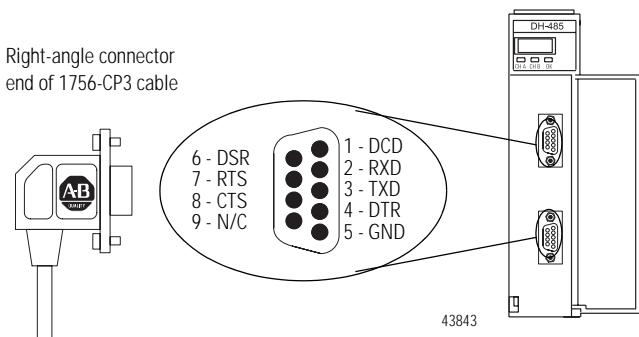
If you are replacing an existing module with an identical one, and you want to resume identical system operation, you must install the new module in the same slot.

Connect the Module Channels to the DH-485 Network

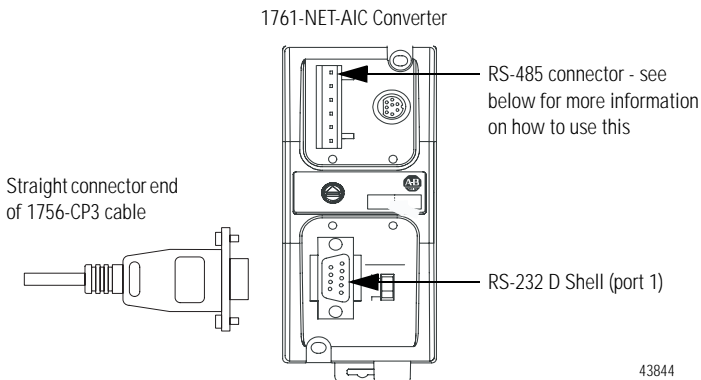
You must use a 1761-NET-AIC Advanced Interface Converter (AIC+) to connect each channel on the 1756-DH485 module to the DH-485 network.

Connect the 1756-DH485 Module to the 1761-NET-AIC Converter

1. Use the 1756-CP3 cable to connect each channel to a 1761-NET-AIC advanced interface converter.
2. Connect the right-angle connector end of the cable to the 1761-NET-AIC converter.



3. Connect the straight connector end of the cable to the 1761-NET-AIC converter.



Connect the 1761-NET-AIC Converter to the DH-485 Network

Use the RS-485 connector to connect the 1761-NET-AIC converter to the DH-485 network. For more information on how to use the 1761-NET-AIC converter, see the following publications:

- Advanced Interface Converter (AIC+) and DeviceNet Interface (DNI) Installation Instructions, publication 1761-IN002
- Advanced Interface Converter (AIC+) User Manual, publication 1761-6.4

Data Highway-485 Communications Connections

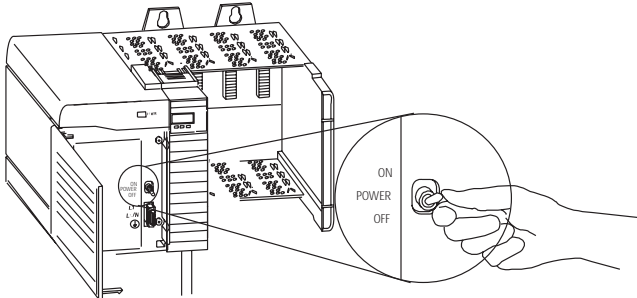
WARNING



If you connect or disconnect the DH-485 cable with power applied to this module or any device on the network, 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.

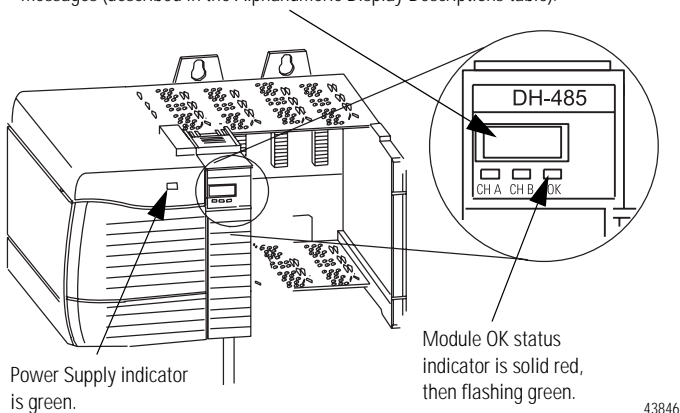
Apply Chassis Power



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Check Power Supply and Module Status

Alphanumeric status indicator illuminates and cycles through a sequence of messages (described in the Alphanumeric Display Descriptions table).



At powerup the module's alphanumeric display begins a cycle through the following sequences.

- Channel A node address
- Channel A status
- Channel B node address
- Channel B status

This sequence runs continuously during normal module operation.

EXAMPLE

If your module uses Channel A for DH-485 messaging with node address 14 and Channel B for DH-485 messaging with node address 20 and the channels are operating properly, you would see A#14, A OK, B#20, B OK.

Troubleshoot the Power Supply

If the alphanumeric indicator on the 1756-DH485 module does not cycle through these messages when you turn the power on, refer to the Power Supply Status table and to the Troubleshooting section that follows.

Power Supply Status

POWER Indicator	Power Supply Status	Recommended Action
Off	Not operating.	Turn power switch ON. Check power wiring connections. Check fuse.
On	Operating.	None, normal operation.

Interpret the Alphanumeric Display

Your 1756-DH485 module displays alphanumeric codes that provide diagnostic information about your module. The alphanumeric display flashes the codes at approximately one second intervals. Table Alphanumeric Display Descriptions summarizes the codes.

Alphanumeric Display Descriptions

Code	Description	Recommended Action
OFF LINE	DH-485 link is in STOP state.	Correct the configuration. Refer to the 1756-DH485 User Manual, publication 1756-UM532.
DUPL NODE	DH-485 Duplicate node address.	Choose another node address and reset switches.
ONLY NODE	Only node on DH-485 link.	Check the cables.
CNFG FALT	Incorrect DH-485 routing table configuration. Incorrect DH-485 object configuration.	Correct the configuration. Refer to the 1756-DH485 user manual, pub. 1756-UM532. Verify the module is inserted in correct slot.

Alphanumeric Display Descriptions

Code	Description	Recommended Action
OK	Normal operation for that channel.	None.
LINK OFF	???	None

Interpret the LED Status Indicators

The LED status indicators on the module provide information about your module and the status of each channel. The following tables outline the indicator condition and the corresponding status, and explain what each condition means.

Interpret the LED Status Indicators

Module OK Indicator	Module Status	Recommended Action
Off	Not operating.	Apply chassis power. Verify module is completely inserted into chassis and backplane.
Green flashing	Operating but not routing messages.	None, if no messages are actively being routed through the module. To route messages, configure module with RSLinx software.
Solid Red, then Off	Performing self-test.	None, normal operation.
Solid Green	Operating and routing messages.	Verify module configuration.
Solid Red	In major fault	Reboot module. If red reoccurs, then replace module.
Red flashing	In major fault or configuration fault.	Check alphanumeric indicator and take action described in the Alphanumeric Display Descriptions table.

LED Actions

Channel A or B Indicator	Channel Status	Recommended Action
Off	Not online.	Place channel online.
Solid Green	Operating.	None, normal operation.
Flashing Green	No other node on the network.	Check cables.
Solid Red	Hardware fault.	Reboot module. If red reoccurs, replace module.
Flashing Red	Either: <ul style="list-style-type: none">• Faulted adapters detected.• Duplicate node detected	<ul style="list-style-type: none">• Check cables.• Check power at other racks.• Check node address.

Set the Network Parameters and Configure the Module

You must use RSLinx software, version 2.43 or later, to set all network parameters and to configure the 1756DH-485 module.

Specifications

ControlLogix DH-485 Communications Module - 1756-DH485 Specifications

Specification	Value
Module Location	ControlLogix chassis
Maximum Backplane Current Load	850 mA @ +5.1V dc and 1.7mA @ 24V dc from I/O chassis backplane
Power Dissipation, Max	4.5 W
Thermal Dissipation, Max	15.4 BTU/hr
Isolation Voltage	50V Tested to withstand 750V dc for 60 s
Available Communication Rates	19.2 Kbps (default) and 9600 Kbps
Screw Terminal Torque	0.5...0.6 Nm
Conductors	
Wire Size	Belden 9463 twinaxial
Category	20 AWG (0.519 mm ²) 2 ⁽¹⁾

⁽¹⁾ Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications

Specification	Value
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): 0...60 °C (32...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), IEC 60068-2-14 (Test Na, Un-packaged Non-operating Thermal Shock): -40...85 °C (-40...185 °F)
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5...95% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10...500 Hz
Operating Shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Non-operating Shock	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g
Emissions	CISPR 11: Group 1, Class A
ESD Immunity	IEC 61000-4-2: 4 kV contact discharges 8 kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10 V/m with 1 kHz sine-wave 80%AM from 80...2000 MHz 10 V/m with 200 Hz 50% Pulse 100%AM at 900 MHz
EFT/B Immunity	IEC 61000-4-4: +/-2 kV at 5 kHz on communications ports

Environmental Specifications

Specification	Value
Surge Transient Immunity	IEC 61000-4-5: +/-1 kV line-earth (CM) on communications ports
Conducted RF Immunity	IEC 61000-4-6: 10 Vrms with 1 kHz sine-wave 80%AM from 150 kHz...80 MHz
Magnetic Field Immunity	IEC 61000-4-8: 30 A/m at 50 Hz
Enclosure Type Rating	None (open-style)

Certifications

Certification	Value
Certifications (when product is marked) ⁽¹⁾	<ul style="list-style-type: none"> UL UL Listed Industrial Control Equipment CSA CSA Certified Process Control Equipment CSA CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations 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 C-Tick Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions

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

Additional Resources

This product also has a user manual, publication 1756-UM532. To view it, visit <http://www.rockwellautomation.com/literature>

To purchase a manual, you can:

- Contact your distributor or Rockwell Automation representative
- Call 800.963.9548 (USA/Canada) or 001.320.725.1574 (outside USA/Canada)

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Notes:

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

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