

# DC-Input/Relay-Output Combination Module

Catalog Number 1762-IQ80W6

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



## Overview

The 1762 I/O is suitable for use in an industrial environment when installed in accordance with these instructions. Specifically, this equipment is intended for use in clean, dry environments (Pollution degree 2<sup>(1)</sup>) and to circuits not exceeding Over Voltage Category II<sup>(2)</sup> (IEC 60664-1).<sup>(3)</sup>

## Prevent Electrostatic Discharge

### ATTENTION



Electrostatic discharge can damage integrated circuits or semiconductors if you touch bus connector pins. Follow these guidelines when you handle the module.

- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch the bus connector or connector pins.
- Do not touch circuit components inside the module.
- Use a static-safe work station, if available.
- Keep the module in its static-shield box when not in use.

## Remove Power

### ATTENTION



Remove power before removing or installing this module. When you remove or install a module with power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices, causing unintended machine motion.
- causing an explosion in a hazardous environment.
- causing permanent damage to the module's circuitry.

Electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.



(1) Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation shall be expected.

(2) Over Voltage Category II is the load level section of the electrical distribution system. At this level transient voltages are controlled and do not exceed the impulse voltage capability of the product's insulation.

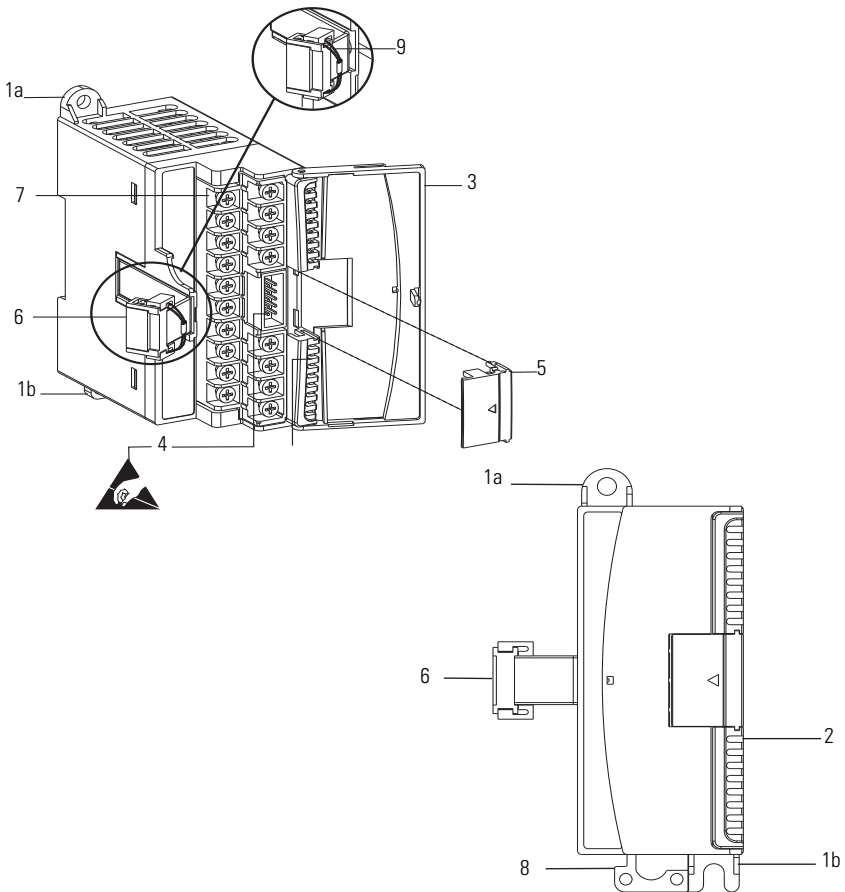
(3) Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

## North American Hazardous Location Approval

The following modules are North American Hazardous Location approved: 1762-IQ8OW6

<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> <li>All wiring must comply with N.E.C. article 501-4(b).</li> <li>The interior of the enclosure must be accessible only by the use of a tool.</li> <li>For applicable equipment (relay modules, etc.), exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relays, Epoxy. It is recommended that the User periodically inspect these devices for any degradation of properties and replace the module if degradation is found.</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 inadapté à une utilisation en environnement de Classe I, Division 2.</li> <li>S'assurer que l'environnement est classé non dangereux avant de changer les piles.</li> </ul>

## Module Description



Item	Description	Item	Description
1a	upper panel mounting tab	5	bus connector cover
1b	lower panel mounting tab	6	flat ribbon cable with bus connector (female pins)
2	I/O diagnostic LEDs	7	terminal block
3	module door with terminal identification label	8	DIN rail latch
4	bus connector with male pins	9	pull loop

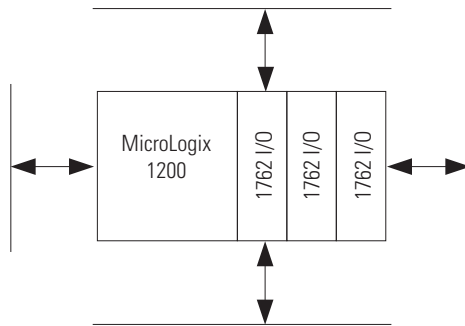
## Install the DC-Input/Relay-Output Combination Module

### ATTENTION



Do not remove protective debris strip until after the module and all other equipment near the module is mounted and wiring is complete. Once wiring is complete and the module is free of debris, carefully remove protective debris strip. Failure to remove strip before operating can cause overheating.

Maintain spacing from enclosure walls, wireways, and adjacent equipment. Allow 50.8 mm (2 in.) of space on all sides for adequate ventilation, as shown:



### TIP

1762 expansion I/O is only mounted horizontally.

### ATTENTION



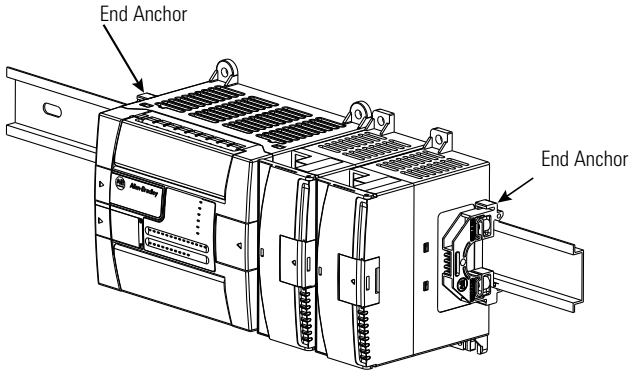
During panel or DIN-rail mounting of all devices, be sure that all debris (metal chips or wire strands) is kept from falling into the module. Debris that falls into the module could cause damage when power is applied to the module.

## Mount the Module on a DIN Rail

The module can be mounted using the following DIN rails: 35 x 7.5 mm (EN 50 022 - 35 x 7.5) or 35 x 15 mm (EN 50 022 - 35 x 15).

Before mounting the module on a DIN-rail, close the DIN-rail latch. Press the DIN-rail mounting area of the module against the DIN-rail. The latch will momentarily open and lock into place.

Use DIN-rail end anchors (Allen-Bradley part number 1492-EA35 or 1492-EAH35) for vibration or shock environments.

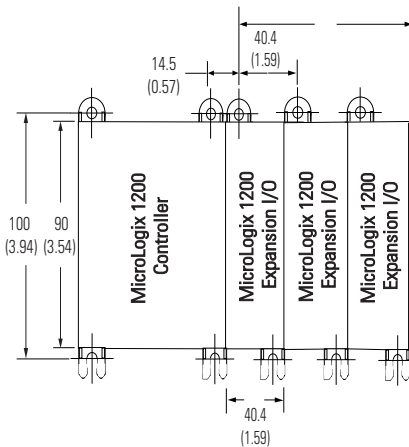
**TIP**

For environments with greater vibration and shock concerns, use the panel mounting method described below, instead of DIN-rail mounting.

## Mount the Module on a Panel

Use the dimensional template shown below to mount the module. The preferred mounting method is to use two M4 or #8 panhead screws per module. M3.5 or #6 panhead screws may also be used, but a washer may be needed to ensure a good ground contact. Mounting screws are required on every module.

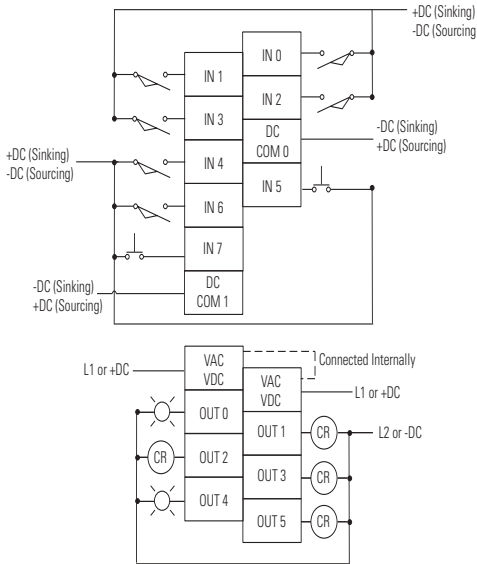
For more than two modules: (number of modules - 1) x 40 mm (1.58 in.)



NOTE: All dimensions are in mm (inches). Hole spacing tolerance:  $\pm 0.4$  mm (0.016 in.).

## Wire the DC-Input/Relay-Output Combination Module

Basic wiring of inputs<sup>(1)</sup> and outputs<sup>(2)</sup> is shown below.



A write-on label is provided with the module. Mark the identification of each terminal with permanent ink, and slide the label back into the door.

### ATTENTION



Be careful when stripping wires. Wire fragments that fall into a module could cause damage when power is applied. Once wiring is complete, ensure the module is free of all metal fragments.

- (1) Sinking/Sourcing Inputs - Sinking/Sourcing describes the current flow between the I/O module and the field device. Sourcing I/O circuits supply (source) current to sinking field devices. Sinking I/O circuits are driven by a current sourcing field device. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. Field devices connected to the positive side (+V) of the field supply are sourcing field devices.
- (2) Surge Suppression – Connecting surge suppressors across your external inductive load will extend the life of the relay contacts. For additional details, refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1.



**ATTENTION**

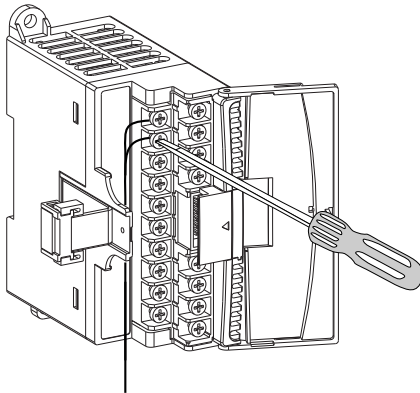
Miswiring of the module to an AC power source will damage the module.

## Ground the DC-Input/Relay-Output Combination Module

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel. Additional grounding connections from the module's mounting tabs or DIN rail (if used) are not required unless the mounting surface cannot be grounded. Refer to Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication [1770-4.1](#), for additional information.

## Wire the Finger-safe Terminal Block

When wiring the terminal block, keep the finger-safe cover in place.



1. Route the wire under the terminal pressure plate.

You can use the stripped end of the wire or a spade lug. The terminals will accept a 6.35 mm (0.25 in.) spade lug.

2. Tighten the terminal screw making sure the pressure plate secures the wire.

Recommended torque when tightening terminal screws is 0.90 Nm (8 lb-in.).

**TIP**

If you need to remove the finger-safe cover, insert a screw driver into one of the square wiring holes and gently pry the cover off. If you wire the terminal block with the finger-safe cover removed, you will not be able to put it back on the terminal block because the wires will be in the way.

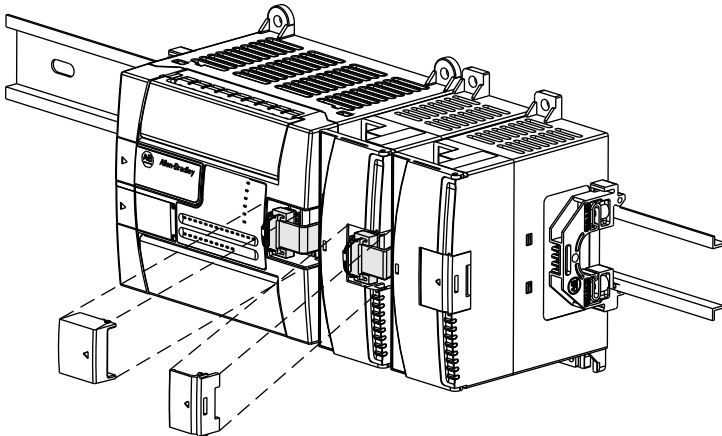
## Wire Size and Terminal Screw Torque

Each terminal accepts up to two wires with the following restrictions:

Wire Type		Wire Size	Terminal Screw Torque
Solid	Cu-90 °C (194 °F)	0.325...2.080 mm <sup>2</sup> (22...14 AWG)	0.90 Nm (8 lb-in.)
Stranded	Cu-90 °C (194 °F)	0.325...1.310 mm <sup>2</sup> (22...16 AWG)	0.90 Nm (8 lb-in.)

## System Assembly

The expansion I/O module is attached to the controller or another I/O module by means of a flat ribbon cable after mounting.



**TIP**

Use the pull loop on the connector to disconnect modules. Do not pull on the ribbon cable.

**ATTENTION****EXPLOSION HAZARD**

- In Class I, Division 2 applications, the bus connector must be fully seated and the bus connector cover must be snapped in place.
- In Class I, Division 2 applications, all modules must be mounted in direct contact with each other as shown on page 6. If DIN-rail mounting is used, an end stop must be installed ahead of the controller and after the last 1762 I/O module.

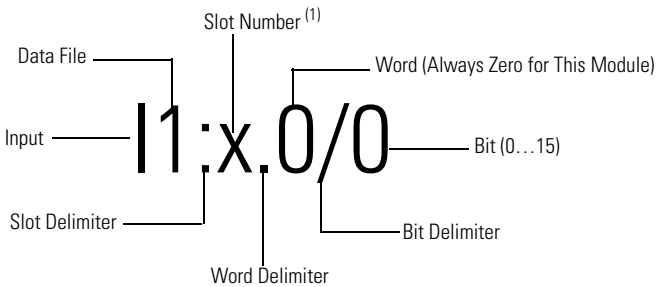
## Input Memory Map

For each input module, the input data file contains the current state of the field input points. Bit positions 0...15 correspond to input terminals 0...15.

Word	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	r	r	r	r	r	r	r	r

r = read only 0 = always at 0 or OFF state.

The input addressing scheme for 1762 expansion I/O is shown below.



(1) I/O located on the controller (embedded I/O) is slot 0. I/O added to the controller (expansion I/O) begins with slot 1.

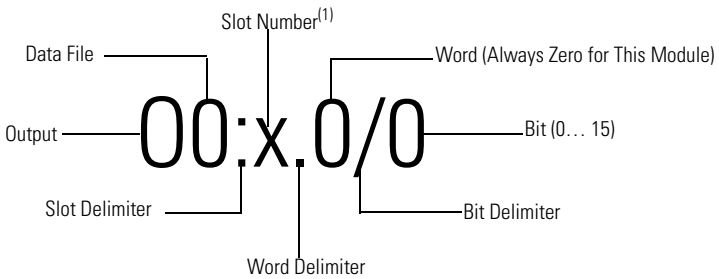
## Output Memory Map

For each output module, the output data file contains the controller-directed state of the digital output points. Bit positions 0...15 correspond to output terminals 0...15.

Word	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0	w*	w*	w	w	w	w	w

w = write only, w\* = user can write but outputs not available, 0= always at 0 or OFF state

The output addressing scheme for 1762 expansion I/O is shown below.



(1) I/O located on the controller (embedded I/O) is slot 0. I/O added to the controller (expansion I/O) begins with slot 1.



## Specifications

### Input Specifications

Specification	Value
Voltage Category	24V DC (Sink/Source) <sup>(1)</sup>
Operating Voltage Range	10...30V DC @ 30 °C (86 °F) 10...26.4V DC @ 65 °C (149 °F)
Number of Inputs	8
On-state Voltage, (Min)	10V DC
Off-state Voltage, (Max)	5V DC
On-state Current, (Min)	2.0 mA
Off-state Current, (Max)	1.5 mA
Inrush Current, (Max)	250 mA
Nominal Impedance	3 k $\Omega$
Input Compatibility	IEC Type 1+
Signal Delay Time, (Max)	On-delay: 8 ms Off-delay: 8 ms

- (1) Sinking/Sourcing Inputs - Sinking/Sourcing describes the current flow between the I/O module and the field device. Sourcing I/O circuits supply (source) current to sinking field devices. Sinking I/O circuits are driven by a current sourcing field device. Field devices connected to the negative side (DC Common) of the field power supply are sinking field devices. Field devices connected to the positive side (+V) of the field supply are sourcing field devices.

## Output Specifications

Specification	Value
Voltage Range	5...265V AC 5...125V DC
Commons per Module	6
Output Type	6-Form A (normally open)
Signal Delay Time	On-delay: 10 mS (max) Off-delay: 10 mS (max)
Off Leakage Current	0 mA
On-state Current (Min.)	10 mA @ 5V DC
Continuous Current per Point	See table on page 14.
Continuous Current per Module	8 A
Total Controlled Load	1440VA/Module max

## Relay Contact Ratings

Volts (max.)	Continuous Amps per Point (Max.)	Amperes <sup>(1)</sup>		Voltamperes	
		Make	Break	Make	Break
240V AC	2.5 A	7.5 A	0.75 A	1800VA	180VA
120V AC		15 A	1.5 A		
125V DC	1.0 A	0.22 A <sup>(2)</sup>		28VA <sup>(2)</sup>	
24V DC	2.0 A	1.2 A		28VA <sup>(2)</sup>	

- (1) Surge Suppression - Connecting surge suppressors across your external inductive load will extend the life of the relay contacts. For additional details, refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
- (2) For DC voltage applications, the make/break ampere rating for relay contacts can be determined by dividing 28 VA by the applied DC voltage. For example, 28 VA/48V DC = 0.58A. For DC voltage applications less than 14V, the make/break rating for relay contacts cannot exceed 2A.



## General Specifications

Specification	Value
Dimensions, HxWxD	90 x 40.4 x 87 (3.54 x 1.59 x 3.43 in.) height including mounting tabs is 110 mm (4.33in.)
Approximate Shipping Weight (with carton)	280g (0.62 lbs.)
Bus Current Draw, (Max)	110 mA @ 5V DC 80 mA @ 24V DC
Heat Dissipation	5.0 W @ 30V DC 4.4 W @ 26.4V DC (The Watts per point, plus the minimum W, with all points energized.)
Power Supply Distance Rating	6
Isolated Group	Group 1 (input 0...3) Group 2 (input 4...7) Group 3 (output 0...5)
Vibration	Operating: 10...500 Hz, 5 g, 0.030 in. max. peak-to-peak, 2 hours per axis. Relay Operation: 1.5 g
Shock	Operating: 30 g panel mounted, 3 pulses per axis Relay Operation: 7 g Non-Operating: 50 g panel mounted, 3 pulses per axis (40 g DIN Rail mounted)
Vender ID Code	1
Product Type Code	7
Product Code	98
Hazardous Environment Class	Class I, Division 2, Hazardous Location, Groups A, B, C, D ISA/ANSI 12.12.01 (C-UL under CSA C22.2 No. 213)
Radiated and Conducted Emissions	EN50081-2 Class A
ESD Immunity (IEC1000-4-2)	4 kV contact, 8 kV air, 4 kV indirect
Radiated Immunity (IEC1000-4-3)	10 V/m, 80...1000 MHz, 80% amplitude modulation, +900 MHz keyed carrier
Fast Transient Burst (IEC1000-4-4)	2 kV, 5 kHz
Surge Immunity (IEC1000-4-5)	2 kV common mode, 1 kV differential mode
Conducted Immunity (IEC1000-4-6)	10V, 0.15...80 MHz <sup>(1)</sup>

(1) Conducted Immunity frequency range may be 150 kHz...30 MHz if the Radiated Immunity frequency range is 30...1000 MHz.

## Environmental Specifications

Specification	Value
Operation Temperature Range	-20...+65 °C (-4...+149 °F)
Storage Temperature Range	-40...+85 °C (-40...+185 °F)
Operating Humidity	5...95% non-condensing
Operating Altitude	2000 m (6561 ft)

## Certifications

Certification (when product is marked) <sup>(1)</sup>	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada.  UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326-1; 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 & 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
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.



## Additional Resources

Refer to	For More Information on this Topic
MicroLogix 1200 Programmable Controllers User Manual (Bulletin 1762 Controllers and Expansion I/O), publication <a href="#">1762-UM001</a> .	Information on installing, wiring, and operating a MicroLogix 1200 programmable controller system
MicroLogix 1200 Programmable Controllers Installation Instructions, publication <a href="#">1762-IN006</a> .	Installation guide for the MicroLogix 1200 programmable controller.
MicroLogix 1100 Programmable Controllers User Manual, publication <a href="#">1763-UM001</a> .	A more detailed description of how to install and use your MicroLogix 1100 programmable controller and expansion I/O system.
MicroLogix 1100 Programmable Controllers Installation Instructions, publication <a href="#">1763-IN001</a> .	Installation guide for the MicroLogix 1100 programmable controllers
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a> .	More information on proper wiring and grounding techniques.

If you would like a manual, you can:

- download a free electronic version from the internet: <http://literature.rockwellautomation.com>.
- purchase a printed manual by contacting your local Allen-Bradley distributor or Rockwell Automation representative

**Notes:**



**Notes:**

# 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 <a href="#">Worldwide Locator</a> at <a href="http://www.rockwellautomation.com/support/americas/phone_en.html">http://www.rockwellautomation.com/support/americas/phone_en.html</a> , 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/>.

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