Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

MicroLogix 1200 16-point DC Input Module

Catalog Number 1762-IQ16

Topic	Page
Summary of Changes	1
Product Overview	1
Mount the Module	5
Field Wiring Connections	7
I/O Memory Mapping	8
Module Specifications	9
Additional Resources	11

Summary of Changes

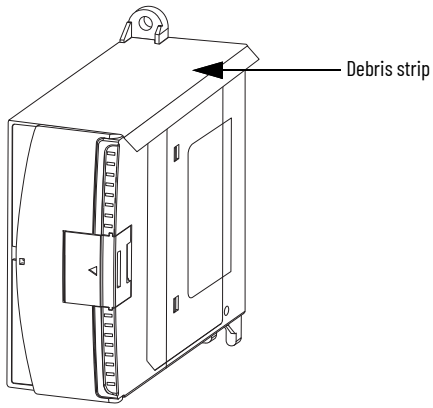
This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Page
Updated template	throughout
Added Inclusive Language acknowledgment	2
Updated Environmental Specifications	10
Updated Certifications	11
Updated Additional Resources	11

Product Overview

The MicroLogix™ 1200 16-point DC input module 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[a]) and to circuits not exceeding Over Voltage Category II[b] (IEC 60664-1)[c].

MicroLogix 1200 16-point DC Input Module



ATTENTION: Do not remove the protective debris strip until after the module and all other equipment in the panel near the module are mounted and wiring is complete. Once wiring is complete, remove the protective debris strip. Failure to remove the strip before operating can cause overheating.

ATTENTION: Electrostatic discharge (ESD) can damage semiconductor devices inside the module. Do not touch the connector pins or other sensitive areas.

(a) Pollution Degree 2 is an environment where, normally, only non-conductive pollution occurs except that occasionally a temporary conductivity that is caused by condensation is expected.
(b) 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.
(c) Pollution Degree 2 and Over Voltage Category II are International Electrotechnical Commission (IEC) designations.

Rockwell Automation

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 EN/IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating.
This equipment is not intended for use in residential environments and may not provide adequate protection to radio communication services in such environments.

This equipment is supplied as open-type equipment for indoor use. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that are present and appropriately designed to help prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to help prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain more 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 more installation requirements.
- NEMA Standard 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

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.

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.
WARNING: **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. • All wiring must comply with N.E.C. article 501-4(b). • The interior of the enclosure must be accessible only by the use of a tool. • For applicable equipment (relay modules, and so on), exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relays, Epoxy. It is recommended that you must periodically inspect these devices for any degradation of properties and replace the module if degradation is found.	**AVERTISSEMENT:** **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.

WARNING: Special Conditions for Safe Use

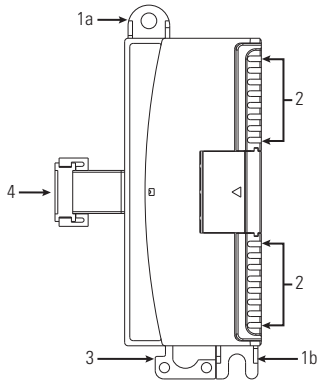
- This product must be installed in an enclosure. All cables connected to the product must remain in the enclosure or be protected by conduit or other means.
- The local programming terminal port is intended for temporary use only and must not be connected or disconnected unless the area is free of ignitable, concentrations of flammable gases or vapors.

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

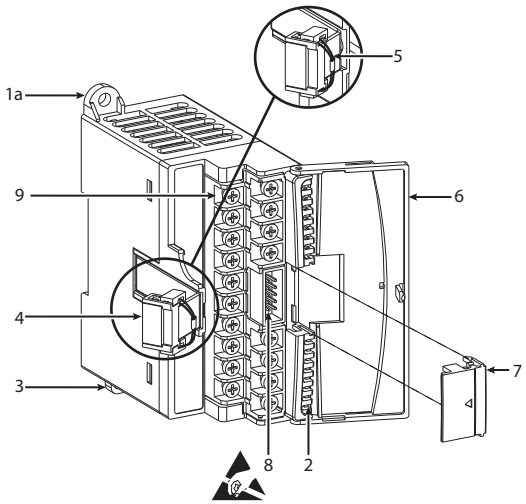
- Sending an erroneous signal to your system's field devices, causing unintended machine motion
- Causing an explosion in a hazardous environment
- Causing permanent damage to the module's circuitry. Electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.
- Do not remove the 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 the strip before operating can cause overheating.
- During panel or DIN rail mounting of all devices, be sure that all debris (metal chips, wire strands, and so on) is kept from falling into the module. Debris that falls into the module could cause damage when power is applied to the module.

IMPORTANT Any illustrations, charts, sample programs, and layout examples that are shown in this publication are intended solely for the purposes of example. Since there are many variables and requirements that are associated with any particular installation, Rockwell Automation does not assume responsibility or liability for actual use based on the examples that are shown in this publication.

Figure 1 - 1762-IQ16 Module Overview



Front view



Left side view

Module Description

	Description		Description
1 a	Upper panel mounting tab	5	Pull loop
1 b	Lower panel mounting tab	6	Module door with terminal identification label
2	I/O diagnostic status indicators	7	Bus connector cover
3	DIN rail latch	8	Bus connector with male pins
4	Flat ribbon cable with bus connector (female pins)	9	Terminal block

This equipment is sensitive to ESD. Follow ESD prevention guidelines when handling this equipment.

ATTENTION: To comply with UL restrictions, this equipment must be powered from a source compliant with Class 2 or Limited Voltage/Current.

Mount the Module

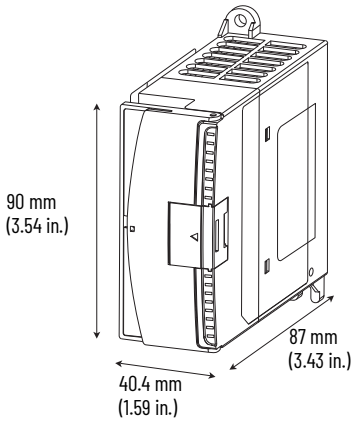
General Considerations

Most applications require installation in an industrial enclosure to reduce the effects of electrical interference and environmental exposure. Locate your controller as far as possible from power lines, load lines, and other sources of electrical noise such as hard-contact switches, relays, and AC motor drives. For more information on proper grounding guidelines, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

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

Mounting Dimensions

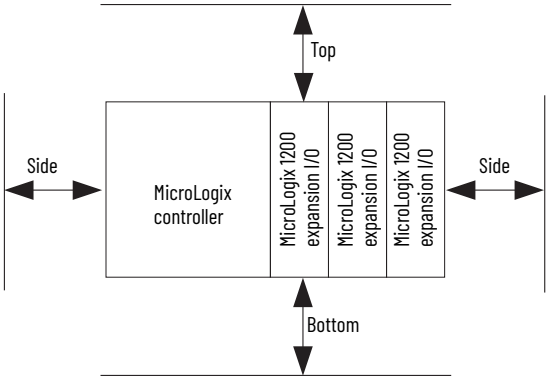
Dimensions do not include the mounting feet and DIN rail latches.



Module Spacing

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

Figure 2 - Module Spacing



IMPORTANT MicroLogix 1200 expansion I/O can be mounted horizontally only.

DIN Rail Mounting

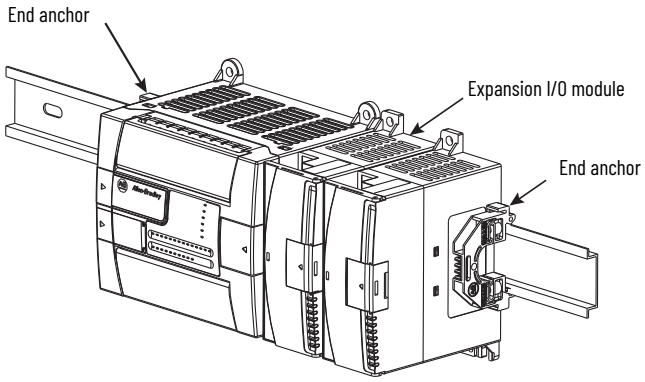
Use one of the following DIN rails to mount the module:

- 35 x 7.5 mm (EN 50 022 - 35 x 7.5)
- 35 x 15 mm (EN 50 022 - 35 x 15)

For environments with greater vibration and shock concerns, use the Panel Mounting method instead of DIN rail mounting.

Before mounting the module on a DIN rail, close the DIN rail latch.

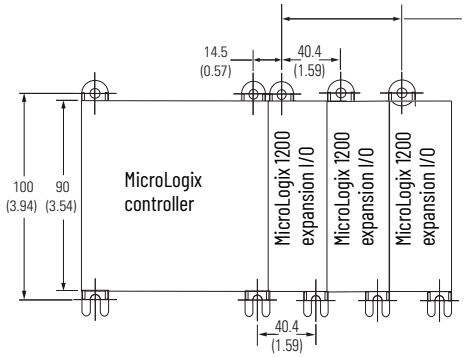
1. Press the DIN rail mounting area of the module against the DIN rail. The latch opens momentarily and locks into place.
2. Use DIN rail end anchors (Allen-Bradley® part number 1492-EAJ35 or 1492-EAHJ35) for vibration or shock environments.



Panel Mounting

Use the dimensional template shown in Figure 3 to mount the module. The preferred mounting method is to use two M4 or #8 pan head screws per module. You can also use M3.5 or #6 pan head screws, but you may need a washer to achieve a good ground current. Mounting screws are required on every module.

Figure 3 - Dimensional Template

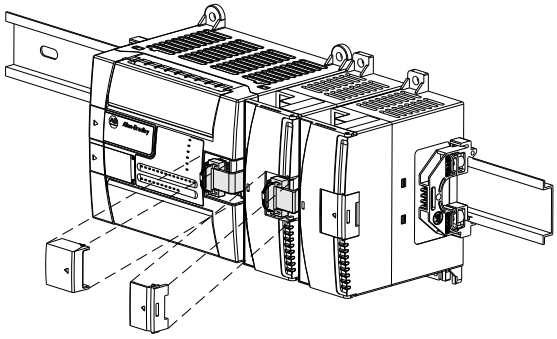


NOTE: All dimensions are in mm (inches). Hole spacing tolerance: ±0.4 mm (0.016 in.).

System Assembly

The expansion I/O module is attached to the controller or another I/O module with a flat ribbon cable after mounting as shown in Figure 4.

Figure 4 - Expansion I/O Assembly



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

Field Wiring Connections

Grounding the Module

In solid-state control systems, grounding and wire routing helps limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw of the controller to the ground bus before you connect any devices. Use 2.5 mm^2 (14 AWG) wire. For AC-powered controllers, this connection must be made for safety purposes.

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. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 for additional information.

WARNING: 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 MicroLogix 1200 expansion I/O module.
- When used in a Class I Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with a proper wiring method that complies with the governing electrical codes.

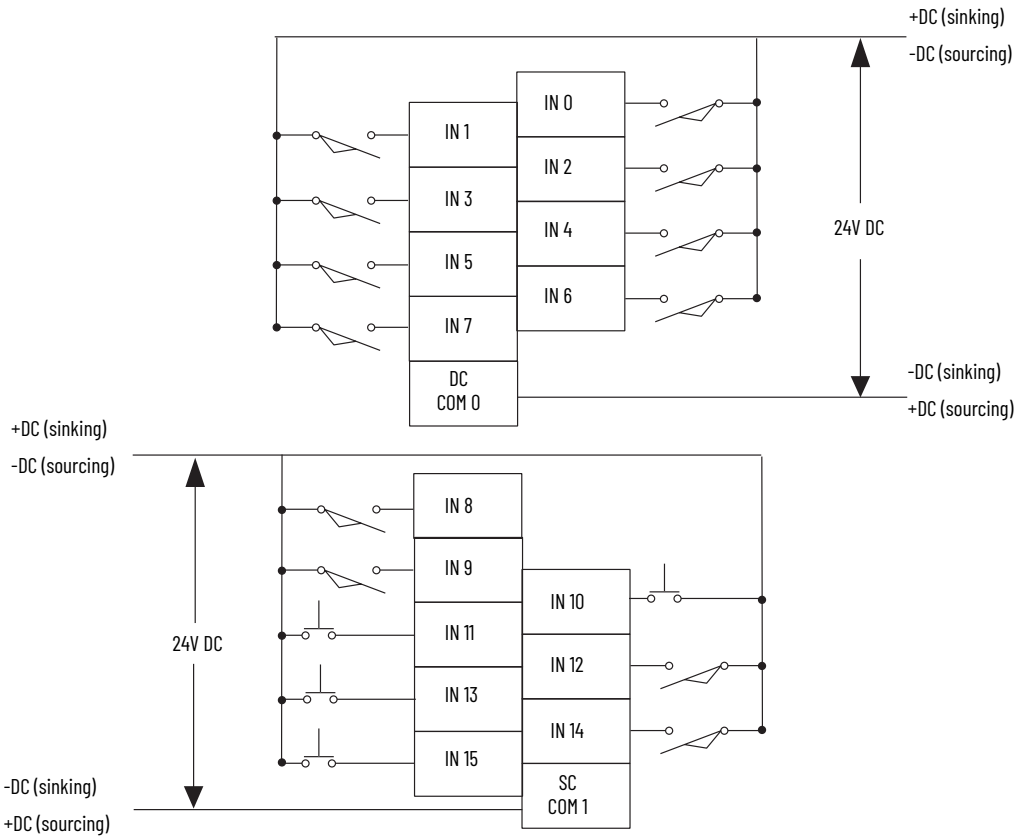
ATTENTION: To comply with the CE Low Voltage Directive (LVD), all connected I/O must be powered from a source compliant with the Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

WARNING: If you connect or disconnect wiring while the field-side power is On, an electric arc can occur. This could cause an explosion in hazardous location installations. Verify that the power is removed or the area is nonhazardous before proceeding.

Wire the Module

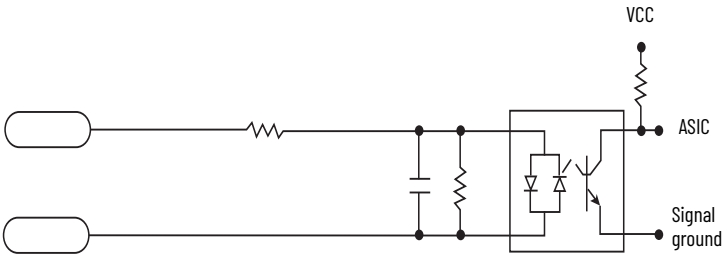
Basic wiring[(a)] of the 16-point DC input module is shown in Figure 5.

Figure 5 - Basic Wiring to the Module



(a) Surge Suppression – Connecting surge suppressors across your external inductive load extends the life of the relay contacts. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1 for additional information.

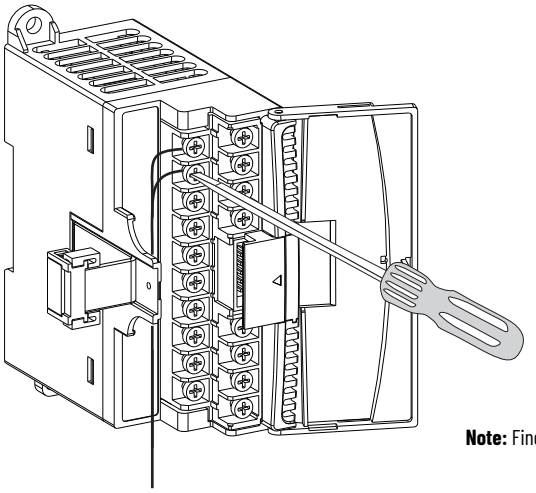
Simplified Input Circuit Diagram



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: Sinking/Sourcing Inputs
Sourcing/Sinking 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.

Wire the Fingersafe Terminal Block



Note: Fingersafe cover is not shown.

When wiring the terminal block, keep the fingersafe 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 accept a 6.35 mm (0.25 in.) spade lug.
2. Tighten the terminal screw and make sure that the pressure plate secures the wire. Recommended torque for terminal screws is 0.90 N•m (8 lb•in).

If you must remove the fingersafe cover, insert a screwdriver into one of the square wiring holes and gently pry the cover off. If you wire the terminal block with the fingersafe cover removed, you cannot put it back on the terminal block because the wires are in the way.

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

I/O Memory Mapping

Input Data File

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.

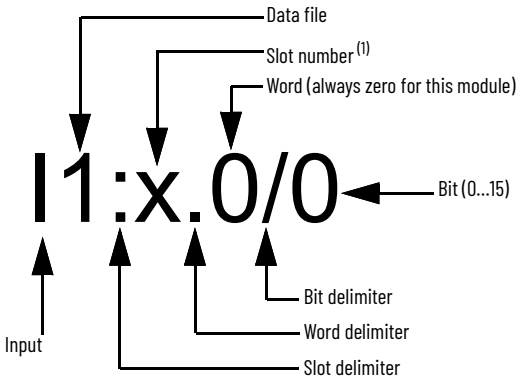
Word	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R

R = Read-only

Addressing

The addressing scheme for MicroLogix 1200 expansion I/O is shown in Figure 6.

Figure 6 - Addressing Scheme



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

Module Specifications

Input Specifications

Attribute	Value
Number of inputs	16
Operating voltage range	10...30V DC 10...26.4V DC See Derating Chart for Each Input on page 11.
Voltage category	24V DC (sink/source)(1)
Bus current draw, max	70 mA @ 5V DC (0.35 W)
Heat dissipation, max	5.4 W @ 30V DC 4.3 W @ 26.4V DC
Signal delay, max	On delay: 8 ms Off delay: 8 ms
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state voltage, min	10 V DC
On-state current, min	2.0 mA min @ 10V DC 8.0 mA nom @ 24V DC 12.0 mA max @ 30V DC
Nominal impedance	3kΩ
IEC input compatibility	Type 1
Isolated groups	Group 1: Inputs 0...7 Group 2: Inputs 8...15
Input group to backplane isolation	Verified by one of the following dielectric tests: 1200V AC for 1 second or 1697V DC for 1 second 75V DC working voltage (IEC Class 2 reinforced insulation)
Vendor ID code	1
Product type code	7
Product code	97

(1) Sinking/Sourcing Inputs — Sourcing/Sinking 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.

General Specifications

Attribute	Value
Dimensions (HxWxD)	**Without mounting tabs:** 90 x 40.4 x 87 mm (3.54 x 1.59 x 3.43 in.) **With mounting tabs:** 110 x 40.4 x 87 mm (4.33 x 1.59 x 3.43 in.)
Shipping weight, approx. (with carbon)	230 g (8.11 oz)
Enclosure type rating	IP20
Wire size	See nested table below
Wire category[1]	2 - On signal ports
Pilot duty rating	Not rated
North American temp code	T3C
Terminal screw torque	0.90 N•m (8 lb•in)[2]

Wire Type	Wire Size		Description
	Min	Max	
Solid	0.34 mm^2 (22 AWG)	2.5 mm^2 (14 AWG)	Copper wire rated @ 90 °C (194 °F)
Stranded	0.34 mm^2 (22 AWG)	1.5 mm^2 (16 AWG)	

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

(2) Tighten RTB hold down screws by hand. Do not tighten the screws with a power tool.

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...+65 °C (-4...+149 °F) See Derating Chart for Each Input on page 11.
Temperature, nonoperating	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% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10...500 Hz
Altitude, operating, max	2000 m (6562 ft)
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): Panel mount - 50 g DIN mount - 40 g
Emissions	EN 61000-6-4
ESD immunity	IEC 61000-4-2: 4 kV contact discharges 8 kV air discharges 4 kV indirect
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80...2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz