Installation Instructions

Original Instructions

Allen-Bradley
by ROCKWELL AUTOMATION

MicroLogix 1200 4-channel Voltage/Current Analog Input Module

Catalog Number 1762-IF4

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.

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Updated template	throughout
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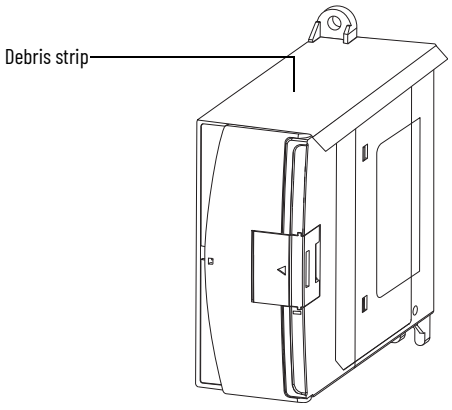
Product Overview

The MicroLogix™ 1200 4-channel voltage/current analog input expansion I/O 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]).

Figure 1 - MicroLogix 1200 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.

(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

ATTENTION: Read this document and the documents listed in the Additional Resources section about installation, configuration and operation of this equipment before you install, configure, operate or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice. If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

注意：在安装、配置、操作和维护本产品前，请阅读本文档以及 “其他资源” 部分列出的有关设备安装、配置和操作的相应文档。除了所有适用规范、法律和标准的相关要求之外，用户还必须熟悉安装和接线说明。

安装、调整、投运、使用、组装、拆卸和维护等各项操作必须由经过适当训练的专业人员按照适用的操作规范实施。

如果未按照制造商指定的方式使用该设备，则可能会损害设备提供的保护。

ATENCIÓN: Antes de instalar, configurar, poner en funcionamiento o realizar el mantenimiento de este producto, lea este documento y los documentos listados en la sección Recursos adicionales acerca de la instalación, configuración y operación de este equipo. Los usuarios deben familiarizarse con las instrucciones de instalación y cableado y con los requisitos de todos los códigos, leyes y estándares vigentes.

El personal debidamente capacitado debe realizar las actividades relacionadas a la instalación, ajustes, puesta en servicio, uso, ensamblaje, desensamblaje y mantenimiento de conformidad con el código de práctica aplicable. Si este equipo se usa de una manera no especificada por el fabricante, la protección provista por el equipo puede resultar afectada.

ATENÇÃO: Leia este e os demais documentos sobre instalação, configuração e operação do equipamento que estão na seção Recursos adicionais antes de instalar, configurar, operar ou manter este produto. Os usuários devem se familiarizar com as instruções de instalação e fiação além das especificações para todos os códigos, leis e normas aplicáveis.

É necessário que as atividades, incluindo instalação, ajustes, colocação em serviço, utilização, montagem, desmontagem e manutenção sejam realizadas por pessoal qualificado e especializado, de acordo com o código de prática aplicável.

Caso este equipamento seja utilizado de maneira não estabelecida pelo fabricante, a proteção fornecida pelo equipamento pode ficar prejudicada.

ВНИМАНИЕ: Перед тем как устанавливать, настраивать, эксплуатировать или обслуживать данное оборудование, прочитайте этот документ и документы, перечисленные в разделе «Дополнительные ресурсы». В этих документах изложены сведения об установке, настройке и эксплуатации данного оборудования. Пользователи обязаны ознакомиться с инструкциями по установке и прокладке соединений, а также с требованиями всех применимых норм, законов и стандартов.

Все действия, включая установку, наладку, ввод в эксплуатацию, использование, сборку, разборку и техническое обслуживание, должны выполняться обученным персоналом в соответствии с применимыми нормами и правилами.

Если оборудование используется не предусмотренным производителем образом, защита оборудования может быть нарушена.

注意：本製品を設置、構成、稼動または保守する前に、本書および本機器の設置、設定、操作についての参考資料の該当箇所に記載されている文書に目を通してください。ユーザは、すべての該当する条例、法律、規格の要件に加えて、設置および配線の手順に習熟している必要があります。

設置調整、運転の開始、使用、組立て、解体、保守を含む諸作業は、該当する実施規則に従って訓練を受けた適切な作業員が実行する必要があります。

本機器が製造メーカにより指定されていない方法で使用されている場合、機器により提供されている保護が損なわれる恐れがあります。

ACHTUNG: Lesen Sie dieses Dokument und die im Abschnitt „Weitere Informationen“aufgeführten Dokumente, die Informationen zu Installation, Konfiguration und Bedienung dieses Produkts enthalten, bevor Sie dieses Produkt installieren, konfigurieren, bedienen oder warten. Anwender müssen sich neben den Bestimmungen aller anwendbaren Vorschriften, Gesetze und Normen zusätzlich mit den Installations- und Verdrahtungsanweisungen vertraut machen.

Arbeiten im Rahmen der Installation, Anpassung, Inbetriebnahme, Verwendung, Montage, Demontage oder Instandhaltung dürfen nur durch ausreichend geschulte Mitarbeiter und in Übereinstimmung mit den anwendbaren Ausführungsvorschriften vorgenommen werden.

Wenn das Gerät in einer Weise verwendet wird, die vom Hersteller nicht vorgesehen ist, kann die Schutzfunktion beeinträchtigt sein.

ATTENTION : Lisez ce document et les documents listés dans la section Ressources complémentaires relatifs à l’installation, la configuration et le fonctionnement de cet équipement avant d’installer, configurer, utiliser ou entretenir ce produit. Les utilisateurs doivent se familiariser avec les instructions d’installation et de câblage en plus des exigences relatives aux codes, lois et normes en vigueur.

Les activités relatives à l’installation, le réglage, la mise en service, l’utilisation, l’assemblage, le démontage et l’entretien doivent être réalisées par des personnes formées selon le code de pratique en vigueur.

Si cet équipement est utilisé d’une façon qui n’a pas été définie par le fabricant, la protection fournie par l’équipement peut être compromise.

주의 : 본 제품 설치 , 설정 , 작동 또는 유지 보수하기 전에 본 문서를 포함하여 설치 , 설정 및 작동에 관한 참고 자료 섹션의 문서들을 반드시 읽고 숙지하십시오 . 사용자는 모든 관련 규정 , 법규 및 표준에서 요구하는 사항에 대해 반드시 설치 및 배선 지침을 숙지해야 합니다 .

설치 , 조정 , 가동 , 사용 , 조립 , 분해 , 유지보수 등 모든 작업은 관련 규정에 따라 적절한 교육을 받은 사용자를 통해서만 수행해야 합니다 .

본 장비를 제조사가 명시하지 않은 방법으로 사용하면 장비의 보호 기능이 손상될 수 있습니다 .

ATTENZIONE Prima di installare, configurare ed utilizzare il prodotto, o effettuare interventi di manutenzione su di esso, leggere il presente documento ed i documenti elencati nella sezione “Altre risorse”, riguardanti l’installazione, la configurazione ed il funzionamento dell’apparecchiatura. Gli utenti devono leggere e comprendere le istruzioni di installazione e cablaggio, oltre ai requisiti previsti dalle leggi, codici e standard applicabili.

Le attività come installazione, regolazioni, utilizzo, assemblaggio, disassemblaggio e manutenzione devono essere svolte da personale adeguatamente addestrato, nel rispetto delle procedure previste.

Qualora l’apparecchio venga utilizzato con modalità diverse da quanto previsto dal produttore, la sua funzione di protezione potrebbe venire compromessa.

DİKKAT: Bu ürünün kurulumu, yapılandırılması, işletilmesi veya bakımı öncesinde bu dokümanı ve bu ekipmanın kurulumu, yapılandırılması ve işletimi ile ilgili İlave Kaynaklar bölümünde yer listelenmiş dokümanları okuyun. Kullanıcılar yürürlükteki tüm yönetmelikler, yasalar ve standartların gereksinimlerine ek olarak kurulum ve kablolama talimatlarını da öğrenmek zorundadır.

Kurulum, ayarlama, hizmete alma, kullanma, parçaları birleştirme, parçaları sökme ve bakım gibi aktiviteler sadece uygun eğitimleri almış kişiler tarafından yürürlükteki uygulama yönetmeliklerine uygun şekilde yapılabilir.

Bu ekipman üretici tarafından belirlenmiş amacın dışında kullanılırsa, ekipman tarafından sağlanan koruma bozulabilir.

注意事項：在安裝、設定、操作或維護本產品前，請先閱讀此文件以及列於 「其他資源」章節中有關安裝、設定與操作此設備的文件。使用者必須熟悉安裝和配線指示，並符合所有法規、法律和標準要求。

包括安装、調整、交付使用、使用、組裝、拆卸和維護等動作都必須交由已經過適當訓練的人員進行，以符合適用的實作法規。

如果將設備用於非製造商指定的用途時，可能會造成設備所提供的保護功能受損。

POZOR: Než začnete instalovat, konfigurovat či provozovat tento výrobek nebo provádět jeho údržbu, přečtěte si tento dokument a dokumenty uvedené v části Dodatečné zdroje ohledně instalace, konfigurace a provozu tohoto zařízení. Uživatelé se musejí vedle požadavků všech relevantních vyhlášek, zákonů a norem nutně seznámit také s pokyny pro instalaci a elektrické zapojení.

Činnosti zahrnující instalaci, nastavení, uvedení do provozu, užívání, montáž, demontáž a údržbu musí vykonávat vhodně proškolený personál v souladu s příslušnými prováděcími předpisy.

Pokud se toto zařízení používá způsobem neodpovídajícím specifikaci výrobce, může být narušena ochrana, kterou toto zařízení poskytuje.

UWAGA: Przed instalacją, konfiguracją, użytkowaniem lub konserwacją tego produktu należy przeczytać niniejszy dokument oraz wszystkie dokumenty wymienione w sekcji Dodatkowe źródła omawiające instalację, konfigurację i procedury użytkowania tego urządzenia. Użytkownicy mają obowiązek zapoznać się z instrukcjami dotyczącymi instalacji oraz oprzewodowania, jak również z obowiązującymi kodeksami, prawem i normami.

Działania obejmujące instalację, regulację, przekazanie do użytkowania, użytkowanie, montaż, demontaż oraz konserwację muszą być wykonywane przez odpowiednio przeszkolony personel zgodnie z obowiązującym kodeksem postępowania.

Jeśli urządzenie jest użytkowane w sposób inny niż określony przez producenta, zabezpieczenie zapewniane przez urządzenie może zostać ograniczone.

OBS! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfigurering och drift av denna utrustning innan du installerar, konfigurerar eller börjar använda eller utföra underhållsarbete på produkten. Användare måste bekanta sig med instruktioner för installation och kabeldragning, förutom krav enligt gällande koder, lagar och standarder.

Åtgärder som installation, justering, service, användning, montering, demontering och underhållsarbete måste utföras av personal med lämplig utbildning enligt lämpligt bruk.

Om denna utrustning används på ett sätt som inte anges av tillverkaren kan det hända att utrustningens skyddsanordningar försätts ur funktion.

LET OP: Lees dit document en de documenten die genoemd worden in de paragraaf Aanvullende informatie over de installatie, configuratie en bediening van deze apparatuur voordat u dit product installeert, configureert, bediend of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsinstructies, naast de vereisten van alle toepasselijke regels, wetten en normen.

Activiteiten zoals het installeren, afstellen, in gebruik stellen, gebruiken, monteren, demonteren en het uitvoeren van onderhoud mogen uitsluitend worden uitgevoerd door hiervoor opgeleid personeel en in overeenstemming met de geldende praktijkregels.

Indien de apparatuur wordt gebruikt op een wijze die niet is gespecificeerd door de fabrikant, dan bestaat het gevaar dat de beveiliging van de apparatuur niet goed werkt.

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

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 the User 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.

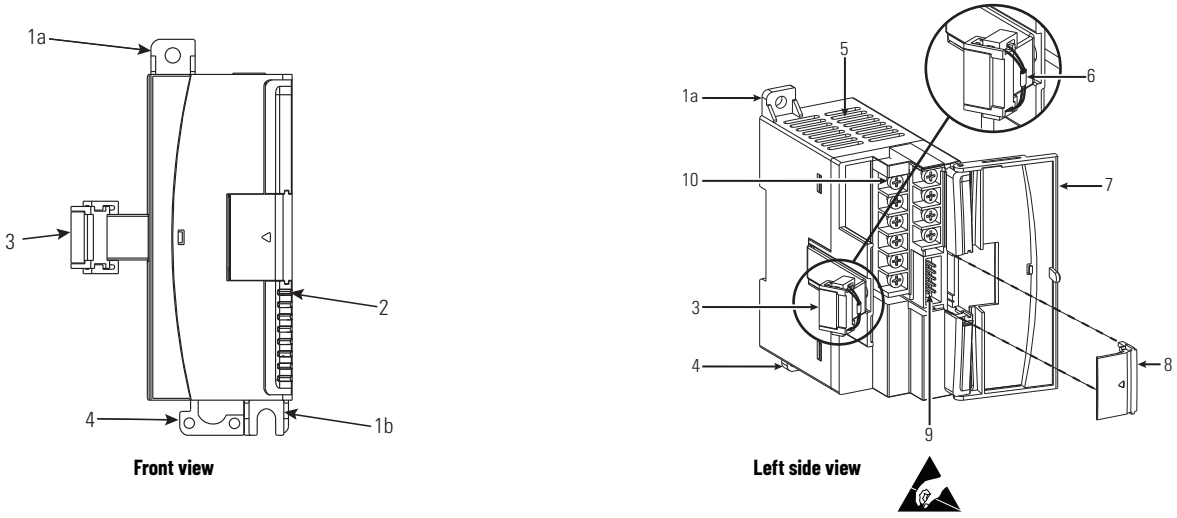
ATTENTION:
Remove power before removing or installing this module. When you remove or install a module with power applied, an electric arc may occur. An electric arc can cause personal injury or property damage by:

- 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 electric 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 the 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.

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

Figure 2 - 1762-IF4 Module Overview



Module Description

	Description		Description
1 a	Upper panel mounting tab	6	Pull loop
1 b	Lower panel mounting tab	7	Module door with terminal identification label
2	Power diagnostic status indicators	8	Bus connector cover
3	Flat ribbon cable with bus connector (female pins)	9	Bus connector with male pins
4	DIN rail latch	10	Terminal block
5	Input type selector switch	–	

This equipment is sensitive to electrostatic discharge (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.

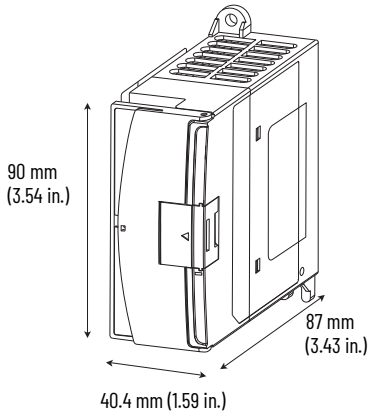
Mount the Module

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.

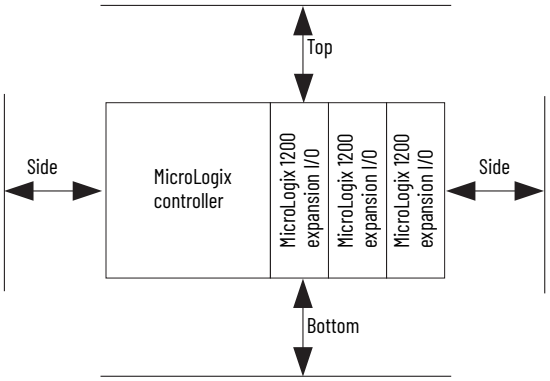
Mounting Dimensions

Measurements do not include mounting feet or 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.



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

DIN Rail Mounting

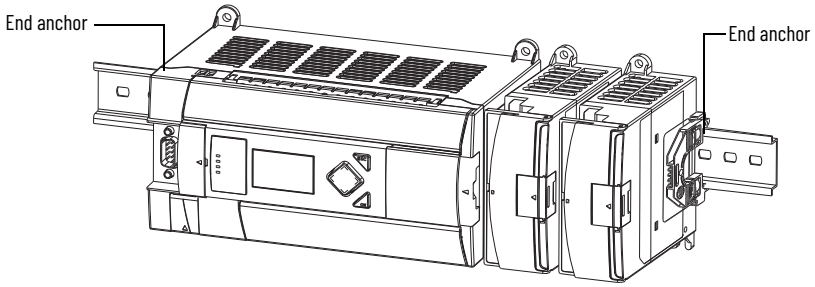
The module can be mounted using the following DIN rails: 35 x 7.5 mm (EN 50 022 - 35 x 7.5) or 35 x 15 mm (EN 50 022 - 35 x 15).

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.

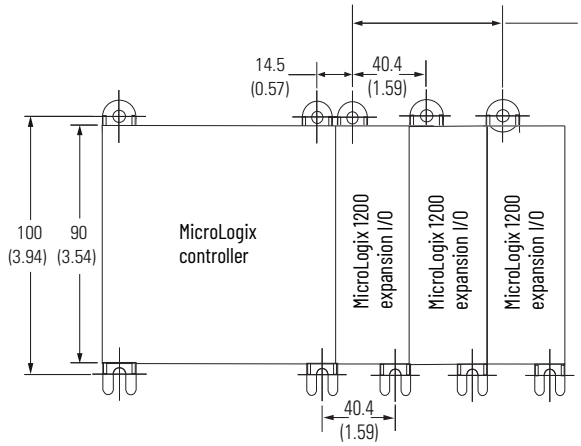
2. Use DIN rail end anchors (Allen-Bradley® part number 1492-EAJ35 or 1492-EAHJ35) for vibration or shock environments.



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

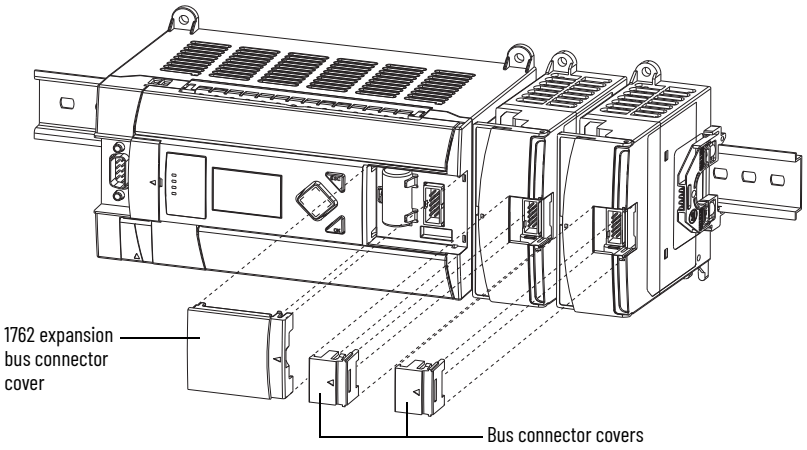


NOTE: All dimensions are in mm (in.). Hole spacing tolerance: ±0.4 mm (0.016 in.).

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

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 connecting any devices. Use 2.08 mm^2 (14 AWG) wire. For AC-powered controllers, this connection must be made for safety purposes.

You must also provide an acceptable grounding path for each device in your application. For more information on proper grounding guidelines, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

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 in Figure 3. If DIN rail mounting is used, an end anchor must be installed ahead of the controller and after the last MicroLogix 1200 expansion I/O module.

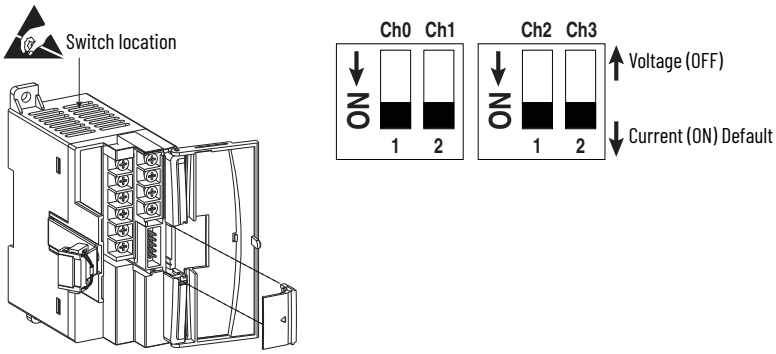
ATTENTION: To comply with the CE Low Voltage Directive (LVD), all connected I/O must be powered from a source compliant with the Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

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

Input Type Selection

Select the input type, current or voltage, using the switch that is located on the module's circuit board and the input type/range selection bits in the Configuration Data File (see page 10). You can access the switch through the ventilation slots on the top of the module. The factory default setting for all switches is Current. Switch positions are shown in Figure 5.

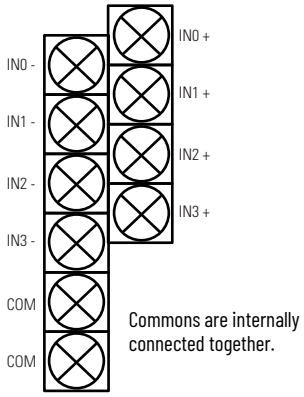
Figure 5 - Input Type Selector Switch Location and Positions



Wire the Module

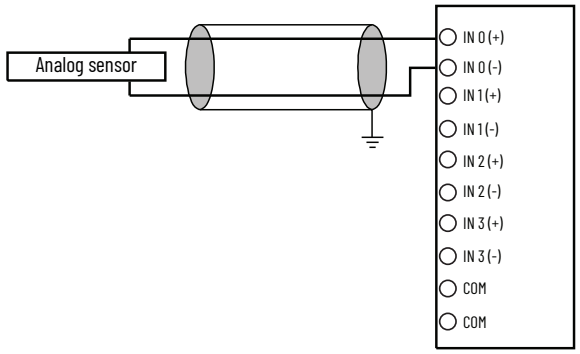
Basic wiring of input devices to the 1762-IF4 is shown in Figure 7 and Figure 8.

Figure 6 - Terminal Block Layout



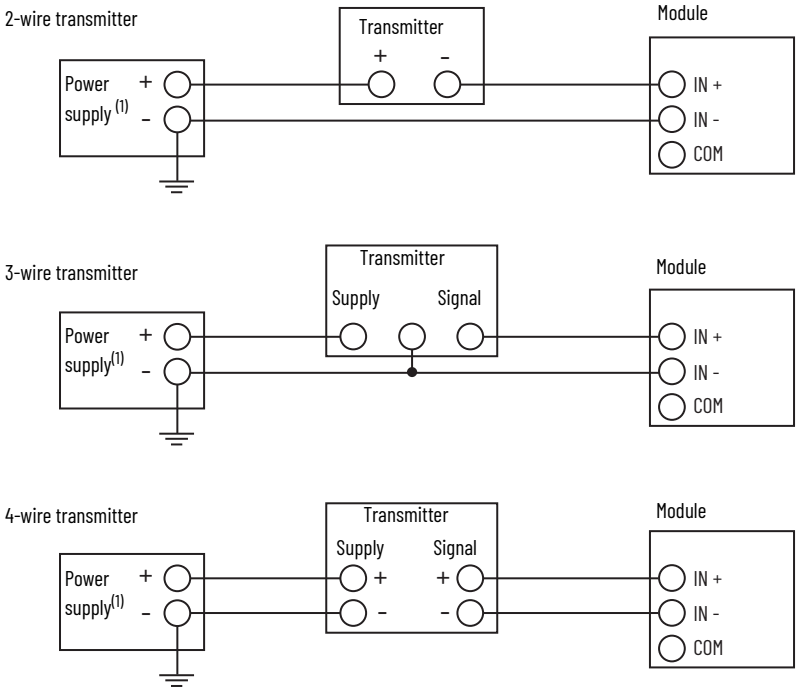
Basic Wiring to the Module

Figure 7 - Differential Sensor Transmitter Types



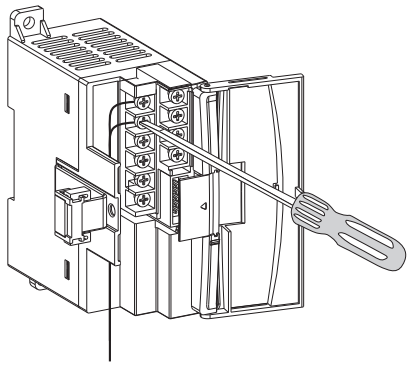
Grounding the cable shield at the module end only usually provides sufficient noise immunity. However, for best cable shield performance, earth ground the shield at both ends, using a 0.01 µF capacitor at one end to block AC power ground currents, if necessary.

Figure 8 - Sensor/Transmitter Types



(1) All power supplies rated N.E.C. Class 2

Wire the Fingersafe Terminal Block



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 that the module is free of all metal fragments.

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 to make sure the pressure plate secures the wire. Recommended torque when tightening terminal screws is 0.904 N•m (8 lb•in).
3. After the wiring is complete, remove the debris shield.

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.

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)	0.34...2.5 mm^2 (22...14 AWG)	0.904 N•m (8 lb•in)
Stranded	Cu-90 °C (194 °F)	0.34...1.5 mm^2 (22...16 AWG)	0.904 N•m (8 lb•in)

Label the Terminals

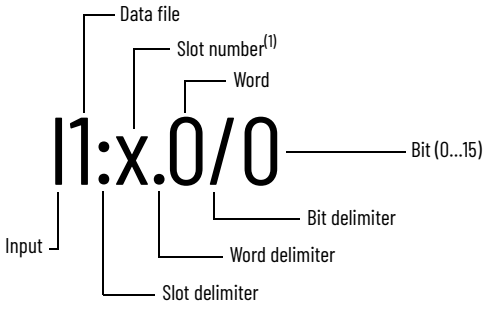
A write-on label is provided with the module. Mark the identification of each terminal with permanent ink, and slide the label back into the door.

I/O Memory Mapping

Addressing

The addressing scheme for MicroLogix 1200 expansion I/O is shown in Figure 9.

Figure 9 - Addressing Scheme



(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.

Input Data File

For each module, slot x, words 0...3 contain the analog values of the inputs. The module can be configured to use either raw/proportional data or scaled-for-PID data.

Words	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	SGN0	Channel 0 Data														
1	SGN1	Channel 1 Data														
2	SGN2	Channel 2 Data														
3	SGN3	Channel 3 Data														
4	Reserved												S3	S2	S1	S0
5	U0	O0	U1	O1	U2	O2	U3	O3	Reserved							
6	Reserved															

The bits are defined as follows:

- Sx = General status bits for channels 0...3. This bit is set when an error (overrange or underrange) exists for that channel, or there is a general module hardware error.
- Ox = Overrange flag bits for channels 0...3. These bits are set when the input signal is above the user-specified range. The module continues to convert data to the maximum full range value during an overrange condition. The bits reset when the overrange condition clears.

- Ux = Underrange flag bits for input channels 0...3. These bits are set when the input signal is below the user-specified range. The module continues to convert data to the maximum full range value during an underrange condition. The bits reset when the underrange condition clears.
- SGNx = The sign bit for channels 0...3.

Configuration Data File

The configuration of the format for analog inputs is made at going to run (GTR). Changes made to the configuration file while in run mode have no effect.

Words	Bit Position															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved	Data Format Channel 0			Type/Range Select Channel 0				Reserved				Filter Select Channel 0			
1		Data Format Channel 1			Type/Range Select Channel 1				Reserved				Filter Select Channel 1			
2		Data Format Channel 2			Type/Range Select Channel 2				Reserved				Filter Select Channel 2			
3		Data Format Channel 3			Type/Range Select Channel 3				Reserved				Filter Select Channel 3			
4	Reserved															
5	Reserved															
6	Reserved															
7	Reserved															

Bit 15 and Bits 7...4 – Reserved

These bits are reserved and are not checked by the module.

Data Format (Bits 14...12)

These bits indicate the format of the data as shown in the following table. Other combinations of these bits are not supported and result in an error.

Bit Settings			Data Format
14	13	12	
0	0	0	Raw/Proportional
0	1	0	Scaled for PID
Other			Not Supported

Type/Range Select (Bits 11...8)

These bits indicate the type and range as in the following table. Other combinations of these bits are not supported and result in an error.

Bit Settings				Data Format
11	10	9	8	
0	0	0	0	Voltage Mode -10...+10V DC
0	0	1	1	Current Mode 4...20 mA
Other				Not Supported

Filter Select (Bits 3...0)

These bits indicate the filter (for desired normal mode rejection) as shown in the table below. Other combinations of these bits are not supported and result in an error.

Bit Settings				Filter Frequency	4-channel Conversion Time	Attenuation at Filter Frequency
3	2	1	0			
0	0	0	0	60 Hz	450 ms	>55 dB
0	0	0	1	50 Hz	530 ms	>55 dB
0	0	1	0	60 Hz	250 ms	>20 dB
0	0	1	1	50 Hz	290 ms	>20 dB
0	1	0	0	No Filter	130 ms	–

Error Codes

The 1762-IF4 module notifies the controller of critical and non-critical errors. The module condition array word 0 contains the error codes that are generated by the module.

"Don't Care" Bits				Module Error			Extended Error Information								
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	0	0	0	0	0	0
Hex Digit 4				Hex Digit 3			Hex Digit 2					Hex Digit 1			

The following table describes the module error codes.

Error Type	Hex Equivalent[1]	Module Error Code	Extended Error Information Code	Error Description
		Binary	Binary	
No Error	X000	000	0 0000 0000	No error
General Common Hardware Error	X200	001	0 0000 0000	General hardware error; no additional information
	X201	001	0 0000 0001	Power-up reset state
Hardware-specific Error	X300	001	1 0000 0000	Reserved
Configuration Error	X400	010	0 0000 0000	General configuration error; no additional information
	X401	010	0 0000 0001	Invalid range select (Channel 0)
	X402	010	0 0000 0010	Invalid range select (Channel 1)
	X403	010	0 0000 0011	Invalid range select (Channel 2)
	X404	010	0 0000 0100	Invalid range select (Channel 3)
	X405	010	0 0000 0101	Invalid filter select (Channel 0)
	X406	010	0 0000 0110	Invalid filter select (Channel 1)
	X407	010	0 0000 0111	Invalid filter select (Channel 2)
	X408	010	0 0000 1000	Invalid filter select (Channel 3)
	X409	010	0 0000 1001	Invalid format select (Channel 0)
	X40A	010	0 0000 1010	Invalid format select (Channel 1)
	X40B	010	0 0000 1011	Invalid format select (Channel 2)
	X40C	010	0 0000 1100	Invalid format select (Channel 3)

(1) X represents "Don't Care".

Module Specifications

Input Specifications

Attribute	Value
Number of inputs	4 differential (bipolar)
A/D converter type	Sigma-delta
Common mode voltage range[1]	±27V
Common mode rejection[2]	> 55 dB @ 50 Hz and 60 Hz
Non-linearity (in percent full scale)	±0.12%
Typical overall accuracy[3]	±0.32% full scale @ -20…+65 °C (-4…+149 °F) ±0.24% full scale @ 25 °C (77 °F)
Input impedance	Voltage terminal: 200 kΩ Current terminal: 275 Ω
Current input protection	±32 mA
Voltage input protection	±30V
Channel diagnostics	Overrange, underrange, or open circuit condition by bit reporting for analog inputs

(1) For proper operation, both the plus and minus input terminals must be within ±27V of analog common.
(2) V_{cm} = 1 V_{pk-pk} AC
(3) V_{cm} = 0 (includes offset, gain, non-linearity, and repeatability error terms)

General Specifications

Attribute	Value
Dimensions HxWxD	90 x 40.4 x 87 mm (3.54 x 1.59 x 3.43 in.)
Shipping weight, approx.	235 g (8.28 oz)
Bus current draw, max	40 mA @ 5V DC 80 mA @ 24V DC
Analog normal operating range	Voltage: -10…+10V DC Current: 4…20 mA
Full scale[1] analog ranges	Voltage: -10.5…+10.5V DC Current: -21…+21 mA
Resolution	15 bits (bipolar)
Repeatability[2]	±0.12%
Input group to system isolation	30V AC/30V DC rated working voltage[3] (IEC Class 2 reinforced insulation) Type test: 500V AC or 707V DC for 1 min
Status indicators	On – Indicates that power is applied.

General Specifications (Continued)

Attribute	Value
Recommended cable	Belden 8761 (shielded)
Vendor ID code	1
Product type code	10
Product code	67
Wire size	See Wire Size and Terminal Screw Torque
Wiring category(4)	2 – on signal ports
Pilot duty rating	Not rated
Enclosure type rating	IP20
North American temp code	T3C

(1) The overrange or underrange flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full-scale range.
(2) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(3) Rated working voltage is the maximum continuous voltage that can be applied at the terminals with respect to earth ground.
(4) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…+65 °C (-4…+149 °F)
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% noncondensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5 g @ 10…500 Hz
Altitude, operating, max	2000 m (6562 ft)
Shock, operating, panel mounted	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30 g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50 g – Panel mounted 40 g – DIN rail mounted
Emissions	IEC 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…6000 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

Certifications

Certification (when product is marked)(1)	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. 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 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11) European Union 2011/65/EU RoHS, compliant with: EN 63000; Technical documentation
RCM	Australian Radiocommunications Act, compliant with: IEC 61000-6-4; Industrial Emissions

Certifications (Continued)

Certification (when product is marked)[1]	Value
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Morocco	Arrêté ministériel n° 6404-15 du 1 er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436
UKCA	2016 No. 1091 – Electromagnetic Compatibility Regulations 2016 No. 1101 – Electrical Equipment (Safety) Regulations 2012 No. 3032 – Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

(1) See the Product Certification link at rok.auto/certifications for Declaration of Conformity, Certificates, and other certification details.

Additional Resources

For more information on the products that are described in this publication, use these resources. You can view or download publications at rok.auto/literature.

Resource	Description
MicroLogix Programmable Controllers Selection Guide, publication 1761-SG001	Provides information on how to build a MicroLogix system with MicroLogix 1400 controllers and 1762 expansion I/O modules.
MicroLogix 1400 Programmable Controllers User Manual, publication 1766-UM001	Provides a more detailed description of how to install and use your MicroLogix 1400 programmable controller and expansion I/O system.
MicroLogix 1400 Programmable Controllers Installation Instructions, publication 1766-IN001	Provides information on how to install and use the MicroLogix 1400 programmable controller.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, rok.auto/certifications	Provides declarations of conformity, certificates, and other certification details.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	rok.auto/support
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Technical Documentation Center	Quickly access and download technical specifications, installation instructions, and user manuals.	rok.auto/techdocs
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	rok.auto/pcdc

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Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at rok.auto/pec.

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