

Installation Instructions

Original Instructions



Allen-Bradley

by ROCKWELL AUTOMATION

CompactLogix 5370 L2 Controllers

Catalog Numbers 1769-L24ER-QB1B, 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK, 1769-L27ERM-QBFC1B

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A CompactLogix™ 5370 L2 controller system includes:

- Embedded 24V DC input, isolated power supply
- Embedded dual Ethernet ports
- Embedded digital, analog, and high-speed counter I/O points, which are wired via a removable connector
- USB port for firmware updates and programming
- Support for 1769 Compact I/O™ modules on the local 1769 CompactBus backplane as local expansion modules
- A 1769-ECR/1769-ECRK right end cap

Summary of Changes

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

Topic	Page
Migrated information from obsolete publication, 1769-PC010D-EN-P	throughout



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、稼働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ー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 ilave 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：在安装、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。

包括安裝、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.

OBŚ! Läs detta dokument samt dokumentet, som står listat i avsnittet Övriga resurser, om installation, konfiguration 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, bedient of onderhoudt. Gebruikers moeten zich vertrouwd maken met de installatie en de bedradingsspecificaties, 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.



ATTENTION:

- Before installing, configuring, operating, or maintaining this product, read this document and the documents that are listed in the Additional Resources section for installing, configuring, or operating equipment. Users should familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.
- Installation, adjustments, putting into service, use, assembly, disassembly, and maintenance shall be carried out by suitably trained personnel in accordance with applicable code of practice. In case of malfunction or damage, no attempts at repair should be made. The module should be returned to the manufacturer for repair. Do not dismantle the module.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- This equipment is certified for use only within the surrounding air temperature range of 0...60 °C (32...140 °F). The equipment must not be used outside of this range.

IMPORTANT

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

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 isn't 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. 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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for 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 additional 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 250 and EN/IEC 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure.

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>
<div style="display: flex; align-items: center;"> <div> <p>WARNING: Explosion Hazard -</p> <ul style="list-style-type: none"> • Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous. </div> </div>	<div style="display: flex; align-items: center;"> <div> <p>AVERTISSEMENT: Risque d'Explosion -</p> <ul style="list-style-type: none"> • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles. </div> </div>

UK and European Hazardous Location Approval

The following applies to products marked II 3 G:

- Are Equipment Group II, Equipment Category 3, and comply with the Essential Health and Safety Requirements relating to the design and construction of such equipment given in Schedule 1 of UKEX and Annex II to EU Directive 2014/34/EU. See the UKEX and EU Declaration of Conformity at rok.auto/certifications for details.
- Provide protection type Ex ec IIC T4 Gc according to EN IEC 60079-0, EXPLOSIVE ATMOSPHERES - PART 0: EQUIPMENT - GENERAL REQUIREMENTS, Issue Date 07/2018 and EN IEC 60079-7:2015+A1:2018 Explosive atmospheres. Equipment protection by increased safety "e".
- Comply to Standards: EN IEC 60079-0, EXPLOSIVE ATMOSPHERES - PART 0: EQUIPMENT - GENERAL REQUIREMENTS, Issue Date 07/2018 and EN IEC 60079-7:2015+A1:2018 Explosive atmospheres. Equipment protection by increased safety "e", reference certificate number DEMKO 12 ATEX 116807X and UL22UKEX2516X.
- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification according to UKEX regulation 2016 No. 1107 and ATEX directive 2014/34/EU.

IEC Hazardous Location Approval

The following applies to products with IECEx certification:

- Are intended for use in areas in which explosive atmospheres caused by gases, vapors, mists, or air are unlikely to occur, or are likely to occur only infrequently and for short periods. Such locations correspond to Zone 2 classification to IEC 60079-0.
 - Provide protection type Ex ec IIC T4 Gc according to IEC 60079-0 and IEC 60079-7.
 - Comply to Standards IEC 60079-0, Explosive atmospheres - Part 0: Equipment - General requirements, Edition 7, Revision Date 2017, IEC 60079-7, 5.1 Edition revision date 2017, Explosive atmospheres - Part 7: Equipment protection by increased safety "e", reference IECEx certificate number IECEx UL 21.0112X.
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Special Considerations for Safe Use



WARNING:

- The equipment shall be mounted in an UKEX/ATEX/IECEx Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (in accordance with EN 60079-0) and used in an environment of not more than Pollution Degree 2 (as defined in EN 60664-1). The enclosure must be accessible only by the use of a tool.
 - This equipment must be used within its specified ratings that are defined by Rockwell Automation.
 - Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140% of the peak rated voltage when applied in Zone 2 environments.
 - Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
 - Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
 - Enclosure must be marked with the following: "Warning - Do not open when energized." After installation of equipment into the enclosure, access to termination compartments must be dimensioned so that conductors can be readily connected.
 - The instructions in the user manual shall be observed.
 - This equipment must be used only with UKEX/ATEX/IECEx certified Rockwell Automation backplanes.
 - Earthing is accomplished through mounting of modules on rail.
 - This equipment isn't resistant to sunlight or other sources of UV radiation.
-

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.
-

Before You Begin

Consider the following before installing a CompactLogix 5370 L2 controller:

- The control system includes a controller, an embedded power supply, and embedded I/O points.
- The embedded power supply is a 24V DC input, isolated power supply.
- You must connect an external Class 2 or SELV-approved power supply to provide 24V DC power to the system.
- The controllers have embedded I/O points. You wire the input and output points via a removable connector.
- The controller supports the use of Compact I/O modules on the local 1769 CompactBus backplane as local expansion modules.
- You must terminate the end of the CompactBus via a 1769-ECR/1769-ECRK right end cap.
- You can't remove nor install Compact I/O modules while the controller is powered.



ATTENTION: CompactLogix 5370 L2 control systems do not support removal and insertion under power (RIUP). Removing a 1769 Compact I/O module or end cap generates a controller fault and may also result in damage to system components.

Install the Secure Digital Card

The controller ships from the factory with the 1784-SD1 Secure Digital (SD) card installed.

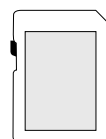
Complete these steps to reinstall an SD card that has been removed from the controller or install a new SD card into the controller.



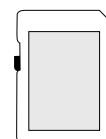
WARNING: When you insert or remove the SD card while power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

1. Verify that the SD card is locked or unlocked according to your preference. When deciding to lock the card before installation, consider that if the card is unlocked, the controller can write data to it or read data from it.

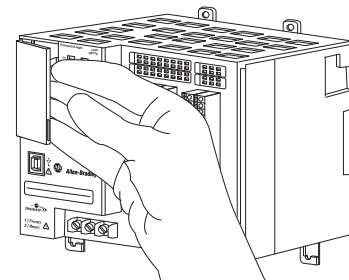
Unlocked



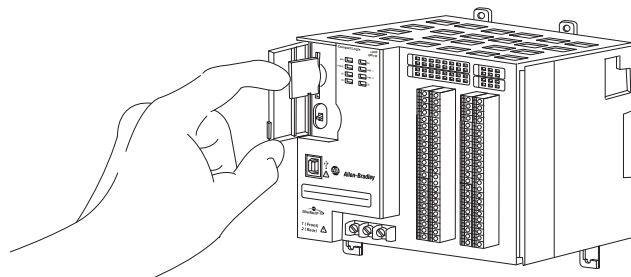
Locked



2. Open the SD card door.

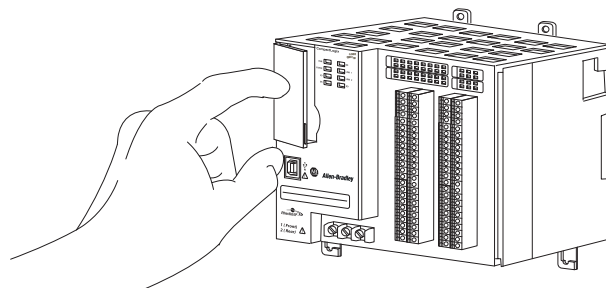


3. Insert the SD card into the SD card slot.



The beveled corner should be at the **bottom**. You can install the SD card in one orientation only. If you feel resistance when inserting the SD card, take it out and change the orientation.

4. Gently press the card until it clicks into place.
5. Close the SD card door.



Mount the System

CompactLogix 5370 L2 control systems are mounted on a DIN rail. Install the DIN rail before completing the steps that are required to install the system.



WARNING: When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring that complies with the governing electrical codes.

Available DIN Rails

You can mount the CompactLogix 5370 L2 controller on the following DIN rails:

- EN 50 022 - 35 x 7.5 mm (1.38 x 0.30 in.)
- EN 50 022 - 35 x 15 mm (1.38 x 0.59 in.)



ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated chromate-passivated steel DIN rail to ensure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to a mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately.

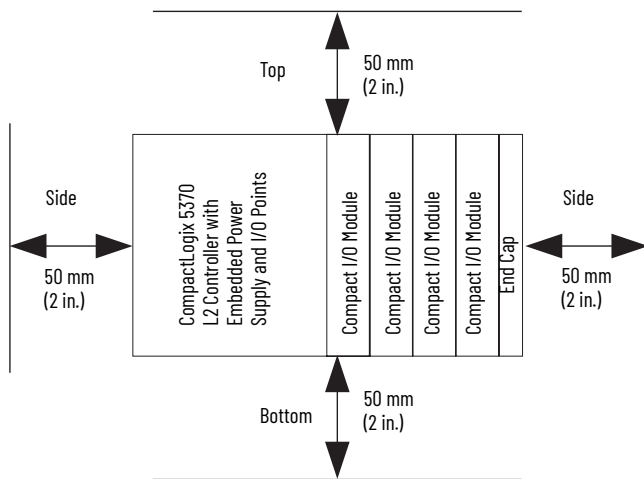
Ground the System



ATTENTION: This product is intended to be mounted to a well-grounded mounting surface. Additional grounding connections from the power supply's mounting tabs or DIN rail aren't required unless the mounting surface can't be grounded. See, *Industrial Automation Wiring and Grounding Guidelines*, publication [1770-4.1](#), for additional information.

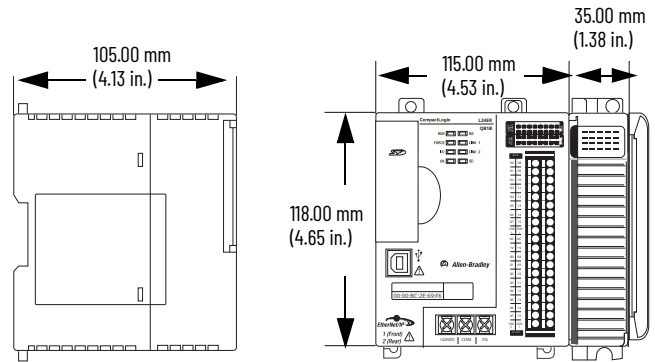
Minimum Spacing

Maintain spacing from enclosure walls, wireways, and adjacent equipment. Allow 50 mm (2 in.) of space on all sides, as shown. This provides ventilation and electrical isolation.

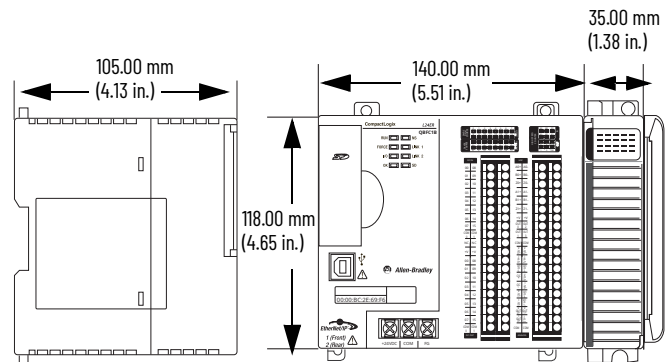


System Dimensions

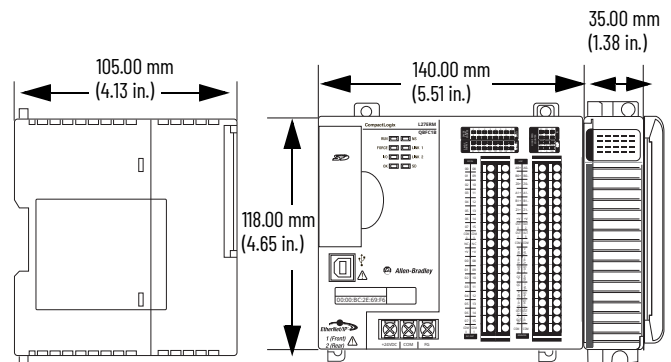
This graphic shows system dimensions for the 1769-L24ER-QB1B controller.



This graphic shows system dimensions for the 1769-L24ER-QBFC1B and 1769-L24ER-QBFC1BK controllers.



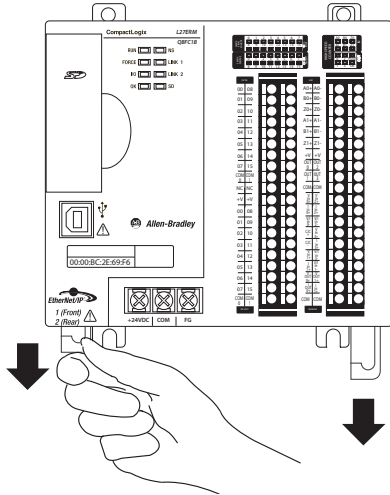
This graphic shows system dimensions for the 1769-L27ERM-QBFC1B controller.



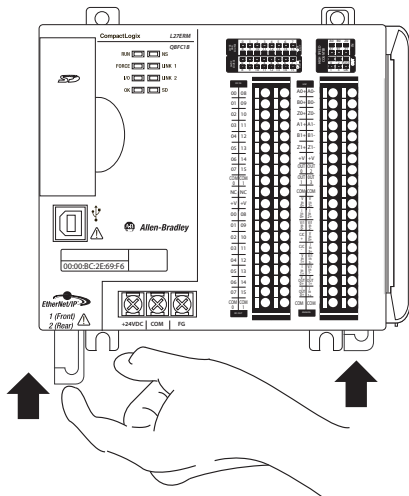
Install the Controller

Complete these steps to install the controller.

1. Pull out the bottom locking tabs.

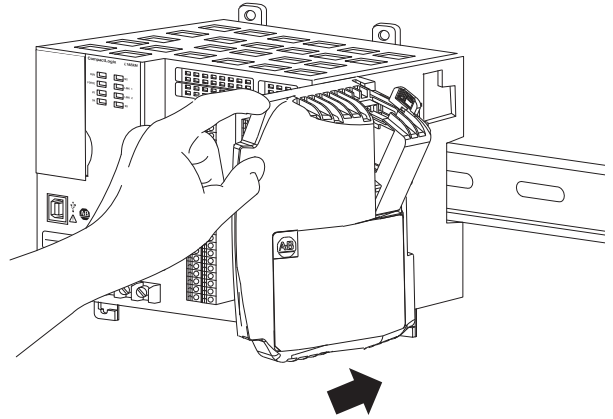


2. Hook the top of the controller on the DIN rail.
3. Swing it downward until the controller is flush against the DIN rail and push it down against the DIN rail.
4. Push the controller against the DIN rail until the bottom DIN rail lock on the back of the controller clicks, locking the controller in place.
5. Push the locking tabs in.

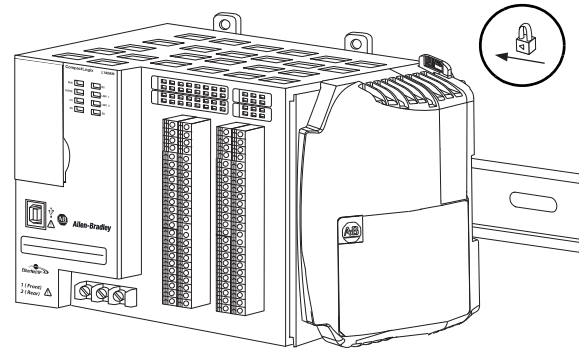


6. Slide the included 1769-ECR/1769-ECRK end cap onto the right side of the controller.

The end cap covers the exposed interconnections on the right side of the controller.



7. Secure the end cap onto the controller by pushing the locking mechanism to the left.



ATTENTION: Failure to use an end cap could result in equipment damage or injury from electric shock.

Connect Power to the Controller

You must connect an external Class 2 or SELV-listed power supply to the embedded power supply of the controller. The external power supply converts 115/230V AC power to 24V DC.



WARNING: Do not connect directly to line voltage. Line voltage must be supplied by a suitable, approved isolating transformer or power supply having short circuit capacity not exceeding 100VA maximum or equivalent.

Consider these points before completing the steps in this section:

- Not all Class 2 or SELV-listed power supplies are certified for use in all applications, for example, use in both nonhazardous and hazardous environments. Before installing an external power supply, consult all specification and certification information to verify that you're using an acceptable external power supply.
- You **must** wire power according to the wiring specifications, for example, the maximum screw torque on a power supply terminal, which are listed in the [Specifications](#) section of this publication.

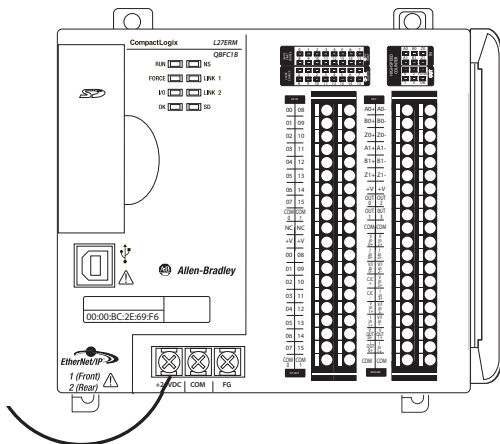
Complete these steps to connect power to the CompactLogix 5370 L2 control system.

1. Verify that the external power supply is installed properly.
2. If appropriate, verify that the power setting on the supply is configured to match the voltage source and that the supply isn't powered.
3. Connect a wire to a +24V DC terminal on the external power supply.

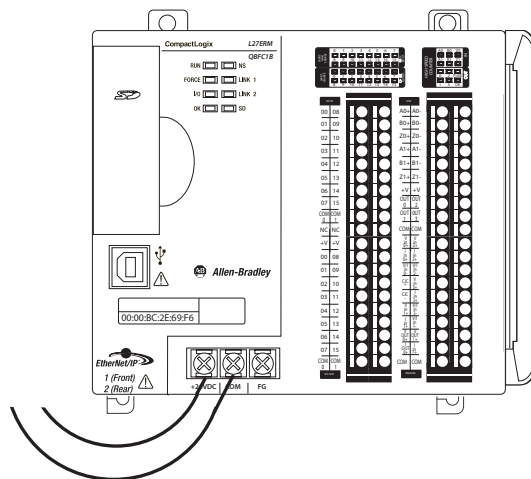


WARNING: If you connect or disconnect wiring while the field-side power is on, an electric arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

4. Strip 8 mm (0.31 in.) insulation from the end of the wire that you connect to the +24V DC terminal on the controller.
5. Connect the wire to the +24V DC terminal on the controller.



6. Connect a wire to a -24V DC terminal on the external power supply.
7. Strip 8 mm (0.31 in.) insulation from the end of the wire that you connect to the COM terminal on the controller.
8. Connect the wire to the COM terminal on the controller.



IMPORTANT If your application requires a power control device, for example, a switch or relay, between the external power supply and the embedded power supply of the CompactLogix 5370 L2 controller to control when the controller is powered, you must install the power control device at the +24V DC terminal on the controller. If you install the power control device at the COM terminal, the CompactLogix 5370 L2 controller can't power up or power down properly. The +24V DC and COM terminals on the CompactLogix 5370 L2 controller are the only terminals that are used to connect power to the CompactLogix 5370 L2 control system. The FG terminal is used to connect a field device to the controller.



CompactLogix 5370 Controllers have an embedded, battery-less Energy Storage Module (ESM) that provides power to the CPU upon power-down, allowing the controller to write the customer application and tag data to the onboard nonvolatile memory. In some cases, the ESM continues to provide enough power to keep the wall clock active until its residual stored energy is depleted.

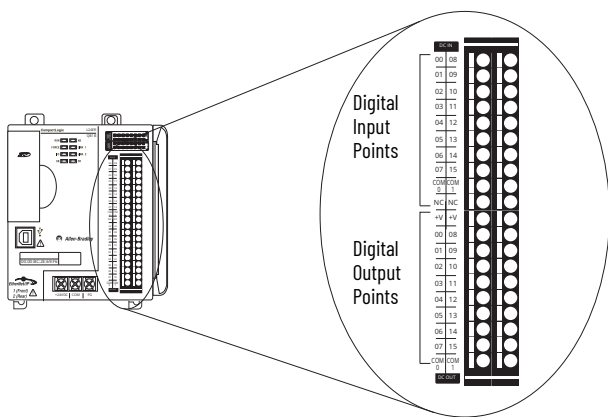
Wire the Embedded I/O Modules

CompactLogix 5370 L2 controllers provide these embedded I/O modules.

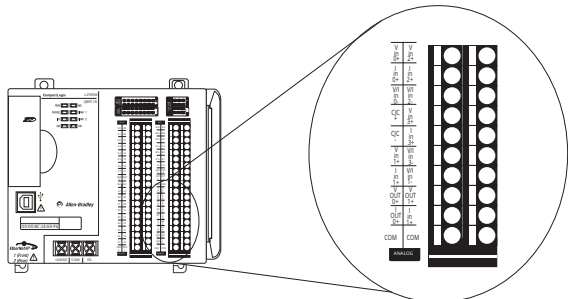
Cat. No.	Sinking/Sourcing 24V DC Digital Input Points	Sinking 24V DC Digital Output Points	High Speed Counters	High-Speed Counter Output Points	Universal Analog Input Points	Analog Output Points	
1769-L24ER-QB1B	16	16	-	-	-	-	
1769-L24ER-QBFC1B			4	4	4	2	
1769-L24ER-QBFC1BK							
1769-L27ERM-QBFC1B							

You **must** wire the embedded I/O modules according to the wiring specifications, for example, wiring insulation-stripping length, which are listed in the [Specifications](#) section of this publication.

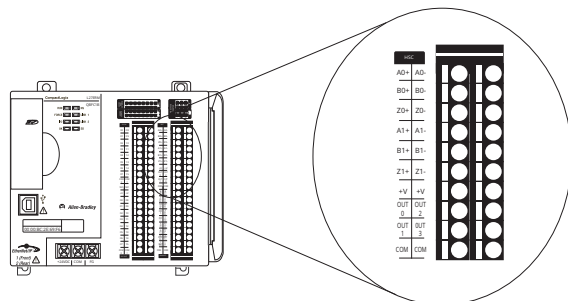
The following graphic shows the **embedded digital I/O module terminations** on a 1769-L24ER-QB1B. The digital I/O module terminations on the 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK, and 1769-L27ERM-QBFC1B controllers are the same.



The following graphic shows the **embedded analog I/O module terminations** on the 1769-L27ERM-QBFC1B controller. The embedded analog I/O module terminations on the 1769-L24ER-QBFC1B and 1769-L24ER-QBFC1BK controllers are the same.



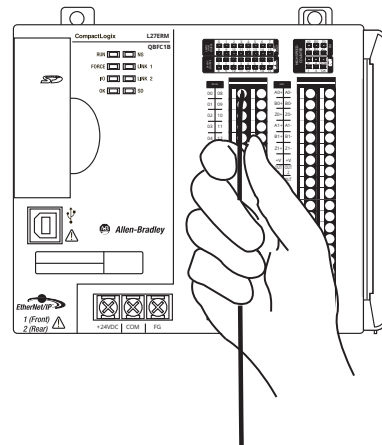
The following graphic shows the **embedded high-speed counter module terminations** on the 1769-L27ERM-QBFC1B controller. The embedded high-speed counter module terminations on the 1769-L24ER-QBFC1B and 1769-L24ER-QBFC1BK controllers are the same.



To wire the input and output points on the CompactLogix 5370 L2 controller, complete these steps.

1. Verify that the control system isn't powered.
2. Strip 10 mm (0.39 in.) insulation from the end of the wire.
3. Push the wire into the connector hole until it's securely in place.

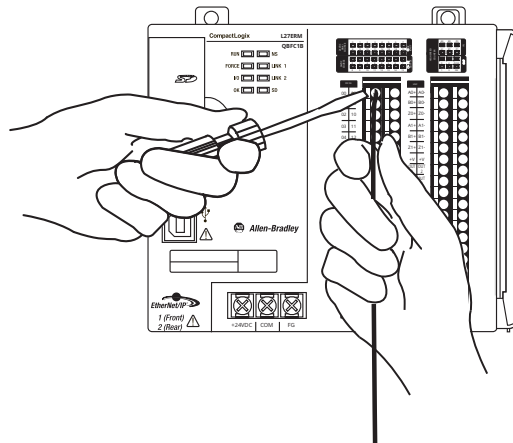
If your wire is too thin to push into the connector hole for secure placement, we recommend that you connect the wire to a ferrule and then insert it into the connector hole.



4. Repeat [step 2](#) for all embedded I/O wires needed in your application.

To remove a wire from the removable connector, complete these steps.

1. Verify that the control system isn't powered.
2. Use a small screwdriver to push the spring release clip and pull out the wire.



Specifications

Attribute	1769-L24ER-Q81B	1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK, 1769-L27ERM-QBFC1B
Temperature, operating • IEC 60068-2-1 (Test Ad, Operating Cold), • IEC 60068-2-2 (Test Bd, Operating Dry Heat), • IEC 6068-2-14 (Test Na, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)	
Temperature, surrounding air, max	60 °C (140 °F)	
Isolation voltage	30V (continuous), Basic Insulation Type, USB to system, Ethernet to system and Ethernet to Ethernet type tested at 500V AC for 60 s	
Wire size, power terminals ⁽¹⁾	0.25...2.50 mm ² (22...14 AWG) solid copper wire rated at 75 °C (167 °F), or greater 1.2 mm (3/64 in.) insulation, max Each terminal accepts only 1 wire	
Wire stripping length, power terminals ⁽¹⁾	8 mm (0.31 in.)	
Screw torque, power terminals ⁽¹⁾	1.0...1.2 N•m (8.9...10.6 lb•in.)	
Wire size, embedded I/O connections	0.205...1.31 mm ² (24...16 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater 1.2 mm (3/64 in.) insulation, max Each terminal accepts only 1 wire	
Wire stripping length, embedded I/O connections	10 mm (0.39 in.)	
Power supply	24V DC, 2.1 A Class 2/SELV At the following temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)	
Backplane out	1.54 A @ 5V DC Value rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)	1.0 A @ 5V DC Value rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)
	0.95 A @ 24V DC Value rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)	0.8 A @ 24V DC Value rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)
DC inputs (16 input points per channel)	10...28.8V DC @ 40 °C (104 °F) 10...26.4V DC @ 60 °C (140 °F)	10...28.8V DC @ 40 °C (104 °F) 10...27.0V DC @ 55 °C (131 °F) 10...26.4V DC @ 60 °C (140 °F)
DC outputs (16 output points per channel, FET sourcing, pilot duty)	0.83 A @ 24V DC @ 40 °C (104 °F) 0.5 @ 24V DC @ 60 °C (140 °F)	0.83 A @ 24V DC @ 40 °C (104 °F) 0.58 A @ 24V DC @ 55 °C (131 °F) 0.5 A @ 24V DC @ 60 °C (140 °F)
Analog inputs	—	V: +/-10V I: 0...20 mA C: +/-100 mV RTD: 0...3000 fC Values rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)
Analog outputs		+/-10V 0...20 mA Values rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F)
High-speed counter inputs		2.6...30.0V DC @ 40 °C (104 °F) 2.6...26.4V DC @ 55 °C (131 °F) 2.6...5V DC @ 60 °C (140 °F)
High-speed counter outputs (4 channels)		1 A per channel, 4 A per module, 30V DC @ 40 °C (104 °F) 0.5 A per channel, 2 A per module, 30V DC @ 55 °C (131 °F) 0.25 A per channel, 1 A per module, 30V DC @ 60 °C (140 °F)

(1) Specification applies to all power terminals, that is, the +24V DC, COM, and FG terminals.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
CompactLogix 5370 Controllers User Manual, publication 1769-UM021	Provides information on how to install, configure, program, and use CompactLogix controllers.
CompactLogix Controllers Specifications Technical Data, publication 1769-TD005	Provides technical data and specifications for CompactLogix controllers.
Ethernet Reference Manual, publication FNET-RM002	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
UL Standards Listing for Industrial Control Products, publication CMPNTS-SR002	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication IC-TD002	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication SGI-11	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
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.

You can view or download publications at [rok.auto/literature](#).

Notes:

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
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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