Allen-Bradley 1769-L36ERM

CompactLogix 3 MB Motion Controller

The 1769-L36ERM is a CompactLogix 5370 L3 controller for machine control and integrated motion over EtherNet/IP. It combines application logic, local I/O control and networked motion in a compact controller platform.



Technical Specifications

Product Identity	
Manufacturer	Allen-Bradley
Complete part number	1769-L36ERM
Controller family	CompactLogix 5370 L3
Functional Configuration	
Ethernet ports	2 ports sharing one IP address
Local programming port	1 × USB; temporary connection
Local expansion capacity	Up to 30 × 1769 Compact I/O modules
Optional nonvolatile memory	1784-SD1 or 1784-SD2
Performance & Power	
User memory	3 MB
Maximum EtherNet/IP nodes	48
Integrated motion capacity	Up to 16 axes over EtherNet/IP
Maximum controller connections	256
Maximum I/O banks	3
Power supply distance rating	4
Backplane current at 5V DC	500 mA
Backplane current at 24V DC	225 mA
Maximum power dissipation	4.5 W
Environment	
Operating temperature	0…60 °C

Selected original manufacturer pages follow on pages 3–8.

Compatibility & Selection Guide

System and software compatibility. The 1769-L36ERM supports up to 16 integrated motion axes and 48 EtherNet/IP nodes. Its 1769 Compact I/O system supports up to 30 local modules across three banks; match the complete catalog number and project firmware to the required control and motion application.

Wiring & Installation Reference

Interfaces and connections

The local system does not support removal or insertion under power.

Use the specified RJ45 Ethernet cabling and a temporary USB cable no longer than 3 m without hubs.

Keep the controller leftmost in the local bank. Its power-supply distance rating is four modules: install no more than three I/O modules between the controller and power supply, and verify every module distance rating and current draw.

Mounting and connection

Assemble with power isolated. Disconnect line power, align the tongue-and-groove connections and fully lock each bus lever.

Mount and ground. Mount horizontally on suitable DIN rail or a panel, maintain 50 mm clearance on all sides, and provide the required ground connection.

Close and connect. Fit the right-hand end cap, connect the selected Ethernet network, and verify controller status after applying power.

Installation precautions. Remove power before changing the controller, power supply, I/O modules or end cap. Do not use USB in hazardous locations. Use ESD precautions and prevent metal chips or wire strands entering the module. Use a suitable enclosure; confirm the exact site requirements before installation.

View connection requirements (PDF) · PDF page 8 | View system assembly · PDF page 7

Manufacturer sources: CompactLogix Controllers Specifications / CompactLogix 5370 L3 Controller Installation Instructions.

Technical Specifications - CompactLogix 5370 Controllers and Compact GuardLogix 5370 Controllers

Attribute	1769-L16ER-BB1B 1769-L18ER-BB1B 1769-L18ERM-BB1B,1769-L18ERM-BB1BK 1769-L19ER-BB1B, 1769-L19ER-BB1BK	1769-L24ER-QB1B 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK 1769-L27ERM-QBFC1B	1769-L30ER, 1769-L30ERK 1769-L30ER-NSE 1769-L30ERM, 1769-L30ERMK 1769-L33ER, 1769-L33ERK, 1769-L33ERM, 1769-L33ERMK 1769-L36ERM 1769-L37ERM, 1769-L37ERMK 1769-L38ERM, 1769-L38ERMK	1769-L30ERMS 1769-L33ERMS, 1769-L33ERMSK 1769-L36ERMS 1769-L37ERMS, 1769-L37ERMSK 1769-L38ERMS, 1769-L38ERMSK
User memory	• 1769-L16ER-BB1B: 384 KB • 1769-L18ER-BB1B, 1769-L18ERM-BB1B, 1769-L18ERM-BB1BK: 512 KB • 1769-L19ER-BB1B, 1769-L19ER-BB1BK: 1 MB	• 1769-L24ER-QB1B, 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK: 750 KB • 1769-L27ERM-QBFC1B: 1 MB	• 1769-L30ER, 1769-L30ER-NSE, 1769-L30ERK, 1769-L30ERM, 1769-L30ERM: 1 MB • 1769-L33ER, 1769-L33ERK, 1769-L33ERM, 1769-L33ERM: 2 MB • 1769-L36ERM: 3 MB • 1769-L37ERM, 1769-L37ERMK: 4 MB • 1769-L38ERM, 1769-L38ERMK: 5 MB	• 1769-L30ERMS: 1 MB standard + 0.5 MB safety • 1769-L33ERMS, 1769-L33ERMSK: 2 MB standard + 1 MB safety • 1769-L36ERMS: 3 MB standard + 1.5 MB safety • 1769-L37ERMS, 1769-L37ERMSK: 4 MB standard + 1.5 MB safety • 1769-L38ERMS, 1769-L38ERMSK: 5 MB standard + 1.5 MB safety
Optional nonvolatile memory	1784-SD1 card with 1 Gb of available memory (shipped with controller) 1784-SD2 card with 2 Gb of available memory (available for separate ordering)			
Number of local expansion modules, max[1]	• 1769-L16ER-BB1B: 6 - 1734 POINT I/O™ modules • 1769-L18ER-BB1B, 1769-L18ERM-BB1B, 1769-L18ERM-BB1BK, 1769-L19ER-BB1B 1769-L19ER-BB1BK: 8 - 1734 POINT I/O modules	4 - 1769 Compact I/O™ modules	• 1769-L30ER, 1769-L30ER-NSE, 1769-L30ERK, 1769-L30ERM, 1769-L30ERMK, 1769-L30ERMS: 8 - 1769 Compact I/O modules • 1769-L33ER, 1769-L33ERK, 1769-L33ERM, 1769-L33ERMK, 1769-L33ERMS, 1769-L33ERMSK: 16 - 1769 Compact I/O modules • 1769-L36ERM, 1769-L36ERMS: 30 - 1769 Compact I/O modules • 1769-L37ERM, 1769-L37ERMK, 1769-L37ERMS, 1769-L37ERMSK: 31 - 1769 Compact I/O modules • 1769-L38ERM, 1769-L38ERMK, 1769-L38ERMS, 1769-L38ERMSK: 31 - 1769 Compact I/O modules	
Number of I/O module banks, max	–	1	3	
Current draw @ 5V DC, controller power	1 A	• 1769-L24ER-QB1B: 1.54 A • 1769-L24ER-QBFC1B, 1769-L27ERM-QBFC1B: 1 A Values rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F).	500 mA	850 mA
Current draw @ 24V DC, controller power	–	• 1769-L24ER-QB1B: 0.95 A • 1769-L24ER-QBFC1B, 1769-L27ERM-QBFC1B: 0.8 A Values rated at these ambient temperatures: 40 °C (104 °F), 55 °C (131 °F), 60 °C (140 °F).	225 mA	700 mA
Current draw @ 24V DC, field power, max	3 A - Combined total for all devices that draw current from field power connections Input: 5 mA Output: 500 mA	–		
Power dissipation, max	11.5 W	• 1769-L24ER-QB1B: 12 W • 1769-L24ER-QBFC1B, L27ERM-QBFC1B: 21 W	4.5 W	6.5 W
Isolation voltage	50V (continuous), Basic Insulation Type Tested at 500V AC for 60 s, System to Field	30V (continuous), Basic Insulation Type, USB to system, Ethernet to system and Ethernet to Ethernet Type tested at 500V AC for 60 s		50V, Basic Insulation Type Tested at 500V AC for 60 s, System to Communication ports.
Short circuit protection, field power	Internal fuse, Non-replaceable	–		
Recommended external short circuit protection, field power	User-provided 4...5 A @ 3.15...5.5 A^2t fuse	–		
Weight, approx	0.66 kg (1.5 lb)	• 1769-L24ER-QB1B: 0.63 kg (1.39 lb) • 1769-L24ER-QBFC1B, 1769-L27ERM-QBFC1B: 0.9 kg (1.9 lb)	0.31 kg (0.68 lb)	0.54 kg (1.18 lb)
Module width	100.00 mm (3.94 in.)	• 1769-L24ER-QB1B: 115.00 mm (4.53 in.) • 1769-L24ER-QBFC1B and 1769-L27ERM-QBFC1B: 140 mm (5.51 in.)	55.00 mm (2.17 in.)	89.00 mm (3.50 in.)
Module location	DIN rail mount	DIN rail or panel mount		
Panel-mount screw torque	—	1.1...1.8 N•m (10...16 lb•in) - use M4 or #8 screws		
Embedded power supply	24V DC input, isolated	24V DC Input, isolated	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4	

I/O Module Support - CompactLogix 5370 L3 and Compact GuardLogix 5370 Controllers

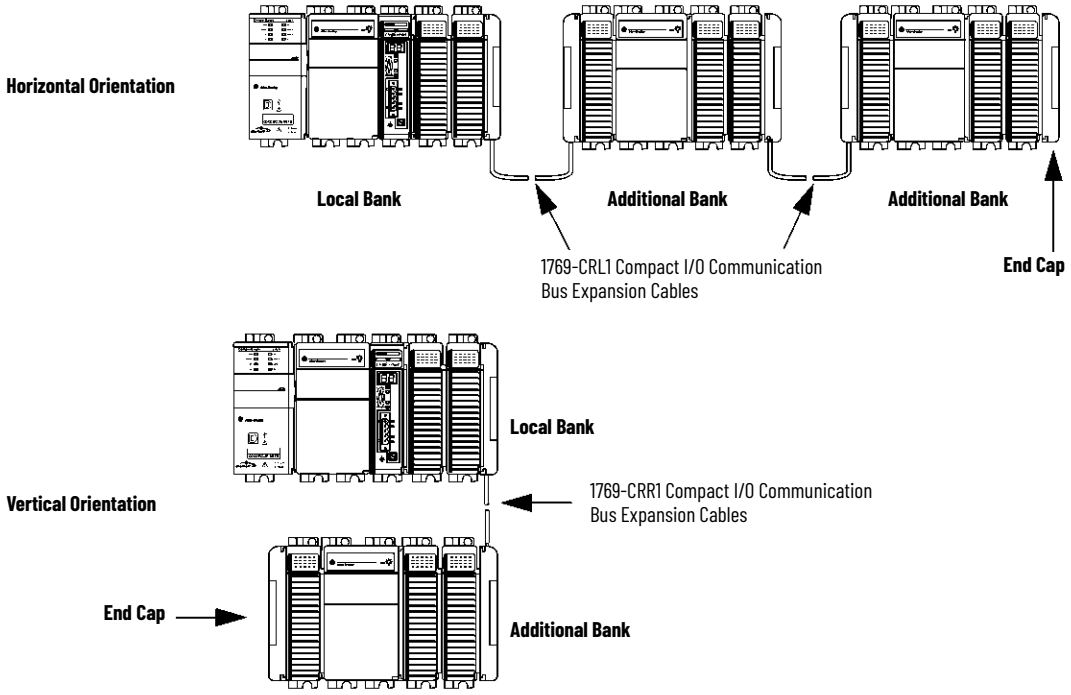
The CompactLogix 5370 L3 controllers offer local expansion modules that are installed across up to three banks of modules. You must use 1769 Compact I/O modules with these controllers.

Remember the following when using I/O modules with the CompactLogix 5370 L3 and Compact GuardLogix 5370 controllers:

- The controller must be the leftmost module in the local bank of the system.
- The number of I/O modules that are supported in a controller system varies by controller catalog number.

Cat. No.	Local 1769 Compact I/O Modules Supported, Max
1769-L30ER, 1769-L30ERK 1769-L30ER-NSE 1769-L30ERM, 1769-L30ERMK 1769-L30ERMS	8
1769-L33ER, 1769-L33ERK 1769-L33ERM, 1769-L33ERMK 1769-L33ERM, 1769-L33ERMSK	16
1769-L36ERM 1769-L36ERMS 1769-L37ERM, 1769-L37ERMK 1768-L37ERMS, 1768-L37ERMSK 1769-L38ERM, 1769-L38ERMK 1769-L38ERMS, 1769-L38ERMSK	30

- You can install I/O modules in as many as three banks, that is, the local bank and two additional banks.
- You can install as many as three I/O modules between the controller and power supply.
- You can install as many as eight I/O modules to the right of the power supply in the local bank.
- You can install as many as eight I/O modules on both the left and right sides of the power supply in additional banks.
- You must consider the distance rating and current draw of the controller and all I/O modules when designing your system.
- Systems with multiple banks can be installed vertically or horizontally.
- You must use expansion cables to connect banks in multi-bank systems.
- You must use an end cap at the end of the last bank in a system.



ATTENTION: Before installing, configuring, operating, or maintaining this product, read this document and the documents 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.
- For CompactLogix™ 5370 L3 controllers, 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 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. 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 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.**
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.	**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.

UK and European Hazardous Location Approval

The following applies to products marked Ⓔx II 3 G. Such modules:

- 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 Regulation 2016 No.1107 and Annex II to EU Directive 2014/34/EU. See the UKEX and EU Declaration of Conformity at rok.auto/certifications for details.
- Provides protection type Ex ec IIC T5 Gc according to EN 60079-7.
- Comply to Standards: EN IEC 60079-0:2018, EN IEC 60079-7:2015+A1:2018 reference certificate number UL 21 ATEX 2603X and UL22UKEX2515X.
- 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.
- May have catalog numbers that end in "K" to indicate conformal coating.

Special Considerations for Safe Use

WARNING:
- This equipment shall be mounted in a UKEX/ATEX 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.
- Provision must 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 certified Rockwell Automation backplanes.
- Earthing is accomplished through mounting of modules on rail.
- Devices shall be used in an environment of not more than Pollution Degree 2.
- This equipment is not resistant to sunlight or other sources of UV radiation.

Energy Storage Considerations

WARNING: This product contains stored energy. If your application requires the controller to deplete its residual stored energy to 40 µJ or less before you transport it into or out of the application, use only the 1769-L30ER-NSE controller. Complete these steps before you remove the controller.

1. Turn off power to the chassis.
2. After you turn off power, the controller's OK status indicator transitions from green to steady red to OFF.
3. Wait at least 15 minutes for the residual stored energy to decrease to 40 µJ or less before you remove the controller.
4. There is no visual indication of when the 15 minutes has expired. You must track that time period.

Prevent Electrostatic Discharge

ATTENTION: This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

Removal and Insertion Under Power

ATTENTION: The CompactLogix 5370 L3 control systems do not support removal and insertion under power (RIUP). These events occur while the CompactLogix system is under power:
- Any break in the connection between the power supply and the controller, for example, removing the power supply, controller, or an I/O controller, can subject the logic circuitry to transient conditions above the normal design thresholds and can result in damage to system components or unexpected behavior.
- Removing an end cap or an I/O controller faults the controller and can 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.

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.

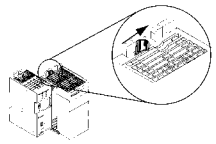
1. Verify that the SD card is locked or unlocked according to your preference. Consider the following when deciding to lock the card before installation:
   If the card is unlocked, the controller can write data to it or read data from it.
2. Open the door for the SD card.
3. Insert the SD card into the SD card slot, following the orientation logo that is printed on the card.
4. Gently press the card until it clicks into place.
5. Close the SD card door.

Assemble the System

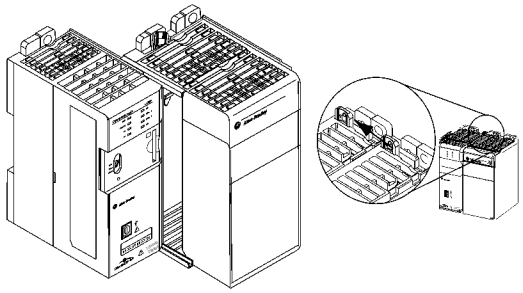
ATTENTION: Do not remove or replace this module while power is applied. Interruption of the backplane can result in unintentional operation or machine motion.

WARNING: Remove power before removing or inserting this module. If you insert or remove the module while backplane 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 line power is disconnected.
2. Make sure that the bus lever of the 1769 Compact I/O™ power supply is in the unlocked position, that is, leaning to the right.



3. Use the upper and lower tongue-and-groove slots to secure the controller and power supply together.
4. Move the power supply back along the tongue-and-groove slots until the bus connectors align with each other.
5. Use your fingers or a small screwdriver to push the bus lever on the power supply back slightly to clear the positioning tab.
6. Move the bus lever of the power supply fully to the left until it clicks; make sure that it locks.



7. If your system does not use any local expansion modules, use the tongue-and-groove slots described earlier to attach a 1769-ECR or 1769-ECRK Compact I/O end cap terminator to the last module in the system.

IMPORTANT	You must install an end cap onto the right side of the CompactLogix 5370 L3 controller system either at the end of the controller or at the end of any local expansion modules that can be installed onto the controller. The covering covers the exposed interconnections on the right side of the controller. Failure to use a protective covering could result in equipment damage or injury from electric shock.

8. Wire the 1769 Compact I/O power supply according to the directions in the Compact I/O Expansion Power Supplies Installation Instructions, publication 1769-IN028.

Mount the System

You can mount a CompactLogix 5370 L3 control system on a DIN rail or on a panel.

ATTENTION: During panel or DIN rail mounting of all devices, be sure that all debris (such as metal chips or wire strands) is kept from falling into the controller. Debris that falls into the controller could cause damage while the controller is energized.

- Mount the system so that the modules are horizontal to each other. If you separate modules into multiple banks, the banks can be vertical or horizontal to each other.
- Allow 50 mm (2 in.) of space on all sides.
- Use two M4 or #8 pan head screws for panel mounting.
- Use EN 50 022 - 35 x 7.5 mm (1.38 x 0.30 in.) or EN 50 022 - 35 x 15 mm (1.38 x 0.59 in.) DIN rails.

ATTENTION: This product is grounded through the DIN rail to chassis ground. Use zinc-plated chromate-passivated steel DIN rail to assure 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 mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately. Be sure to ground the DIN rail properly. See Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for more information.

Ground the System

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

Network Connectors and Cable

This product has a USB port.

WARNING: Do not use the USB port in hazardous locations.

ATTENTION: The USB port is intended only for temporary local programming purposes and is not intended for permanent connection.
The USB cable is not to exceed 3.0 m (9.84 ft) and must not contain hubs

This product has two Ethernet ports.

Ports	Requirements
Wire type, Ethernet	Connector/cable: RJ45 connector according to IEC 60603-7; 2 or 4-pair Category 5e minimum cable, according to TIA 568-B.1 or Category 5 cable according to ISO/IEC 24702