Installation Instructions

CompactLogix 5370 L2 Controllers
Catalog Numbers 1769-L24ER-QB1B, 1769-L24ER-QBFC1B, 1769-L24ER-QBFC1BK, 1769-L27ERM-QBFC1B

Prevent Electrostatic Discharge

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 right end cap.
You cannot 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 will generate a controller fault and may also result in damage to system components.

**Install the Secure Digital Card**

The CompactLogix 5370 L2 controller is shipped from the factory with the 1784-SD1 SD card installed.

Complete these steps to re-install an SD card that has been removed from the controller back into the controller or if installing a new SD card into the controller.

**WARNING:** When you insert or remove the SD card while power is on, an electrical 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 before installation. Consider the following points:
   - If the card is unlocked, the controller can write data to it or read data from it.
   - If the card is locked, the controller can only read data from it.
2. Open the door for the SD card.

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

4. Gently press the card until it clicks into place.

5. Close the SD card door.

We recommend you close the SD card door during system operation.
Mount the System

Mount a CompactLogix 5370 L2 control system on a DIN rail or a panel.

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

**ATTENTION:** This product is grounded through the DIN rail to chassis ground. Use zinc-plated yellow-chromate 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.

You can mount the CompactLogix 5370 L2 controller on these 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.)
**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 the system dimensions for the 1769-L27ERM-QBFC1B controller.
Mount the Controller on a Panel

Use two M4 or #8 panhead screws to mount the controller. Mounting screws are required on every module. Use this procedure to use the assembled modules as a template for drilling holes in the panel.

**IMPORTANT** Due to module mounting hole tolerance, it is important to follow these procedures.

1. On a clean work surface, assemble no more than three modules.
2. Using the assembled modules as a template, carefully mark the center of all module-mounting holes on the panel.
3. Return the assembled modules to the clean work surface, including any previously mounted modules.
4. Drill and tap the mounting holes for the recommended M4 or #8 screw.
5. Place the modules back on the panel and check for proper hole alignment.

**TIP** The grounding plate, that is, where you install the mounting screws, grounds the module when it is panel-mounted.

6. Use the mounting screws to attach the modules to the panel.

**TIP** If you are mounting more modules, mount only the last one of this group and put the others aside. This reduces remounting time when you are drilling and tapping the next group of modules.

7. Repeat steps 1…6 for any remaining modules.
Mount the Controller on the DIN Rail

You can mount the 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 yellow-chromate 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.

1. Hook the DIN rail latch at the top of the back of the controller on the DIN rail.
2. Swing the controller downward until it touches the DIN rail and press the controller against the DIN rail until it clicks in place.
   The click verifies that controller is locked on the DIN rail.

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. Refer to Industrial Automation Wiring and Grounding Guidelines, Rockwell Automation publication 1770-4.1, for additional information.
Install the Controller

Complete these steps to install the controller.

1. Pull the bottom locking tabs out.

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 1769-ECR/1769-ECRK end cap onto the right side of the controller.
   The covering covers the exposed interconnections on the right side of the controller.

   **ATTENTION:** Failure to use a protective covering could result in equipment damage or injury from electric shock.

7. Push the end cap locking mechanism to the right to lock it onto the controller.

**Connect Power to the Controller**

You must connect an external Class 2 or SELV-listed power supply to the controller’s embedded power supply. 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 100 VA maximum or equivalent.
Consider these points before completing the steps in this section:

- An external power supply must reside in the same enclosure as the CompactLogix 5370 L2 controller.
  
  If the external power supply and controller are located in separate enclosures, an electrical arc can occur when power is applied.

- 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 are 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, listed in the CompactLogix 5370 L2 Controllers Product Information Sheet, publication 1769-PC010.

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 is not 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 electrical 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 will connect to the +24VDC terminal on the controller.
5. Connect the wire to the +24VDC 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 will 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 CompactLogix 5370 L2 controller’s embedded power supply to control when the controller is powered, you must install the power control device at the +24VDC terminal on the controller.

If you install the power control device at the COM terminal, the CompactLogix 5370 L2 controller may not power up or power down properly.

The previous section describes how to wire terminals +24VDC and COM on the CompactLogix 5370 L2 controller. They are the only terminals you wire to power the CompactLogix 5370 L2 control system.

You should only use the FG terminal as appropriate when connecting a field device to the controller.
CompactLogix 5370 L2 controllers provide embedded I/O modules as described in the following table.

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Sourcing 24V DC Digital Input Points</th>
<th>Sinking 24V DC Digital Output Points</th>
<th>High Speed Counters</th>
<th>High Speed Counter Output Points</th>
<th>Universal Analog Input Points</th>
<th>Analog Output Points</th>
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<tr>
<td>1769-L24ER-QB1B</td>
<td>16</td>
<td>16</td>
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<td>1769-L27ERM-QBFC1B</td>
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</table>

You must wire the embedded I/O modules according to the wiring specifications, for example, wiring insulation stripping length, listed in the CompactLogix 5370 L2 Controllers Product Information Sheet, publication 1769-PC010.

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-L24ERM-QBFC1BK, and 1769-L27ERM-QBFC1B controllers are the same.
The following graphic shows the embedded analog I/O module terminations on the 1769-L27ER-QB1B 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-L27ER-QB1B controller. The embedded high-speed counter module terminations on the 1769-L24ER-QBFC1B and 1769-L24ER-QBFC1BK controllers are the same.
Wiring the Embedded I/O Modules

Complete these steps to wire the input and output points on the CompactLogix 5370 L2 controller.

1. Verify that the control system is not 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 is 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 is not powered.
2. Use a small screwdriver to push on the spring release clip and pull the wire out.
Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At [http://www.rockwellautomation.com/support](http://www.rockwellautomation.com/support), you can find technical manuals, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools. You can also visit our Knowledgebase at [http://www.rockwellautomation.com/knowledgebase](http://www.rockwellautomation.com/knowledgebase) for FAQs, technical information, support chat and forums, software updates, and to sign up for product notification updates.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect™ support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit [http://www.rockwellautomation.com/support/](http://www.rockwellautomation.com/support/).

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that’s contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
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</thead>
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<tr>
<td>United States or Canada</td>
<td>1.440.646.3434</td>
</tr>
<tr>
<td>Outside United States or Canada</td>
<td>Use the Worldwide Locator at <a href="http://www.rockwellautomation.com/support/americas/phone_en.html">http://www.rockwellautomation.com/support/americas/phone_en.html</a>, or contact your local Rockwell Automation representative.</td>
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New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

<table>
<thead>
<tr>
<th>Location</th>
<th>Action</th>
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</thead>
<tbody>
<tr>
<td>United States</td>
<td>Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.</td>
</tr>
<tr>
<td>Outside United States</td>
<td>Please contact your local Rockwell Automation representative for the return procedure.</td>
</tr>
</tbody>
</table>

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Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at [http://www.rockwellautomation.com/literature/](http://www.rockwellautomation.com/literature/).

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](http://rok.auto/pec).

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