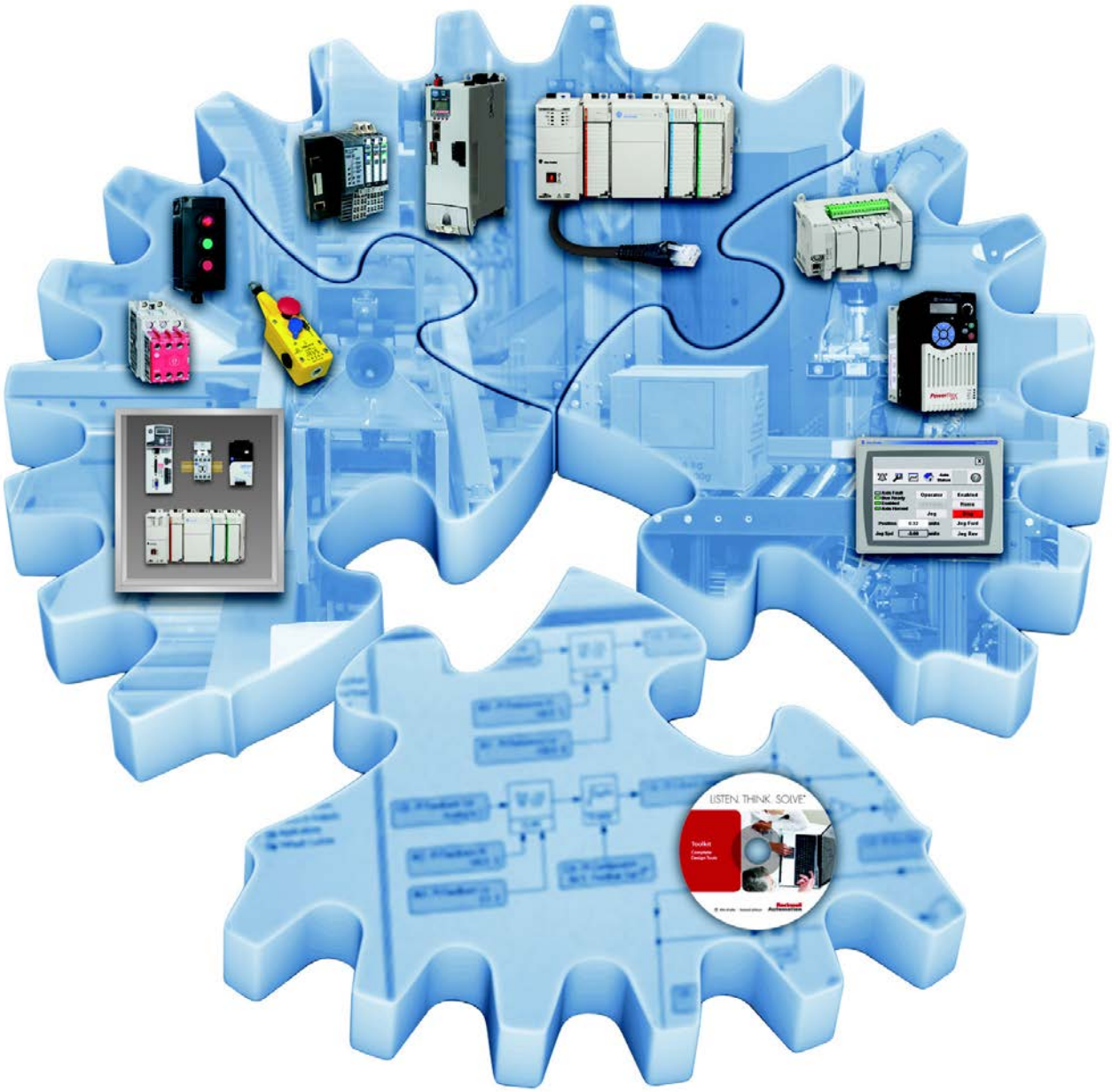
Quick Start

Allen-Bradley

Logix5000 Control Systems: Connect Kinetix 350 Drives over an EtherNet/IP Network



Important User Information

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.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

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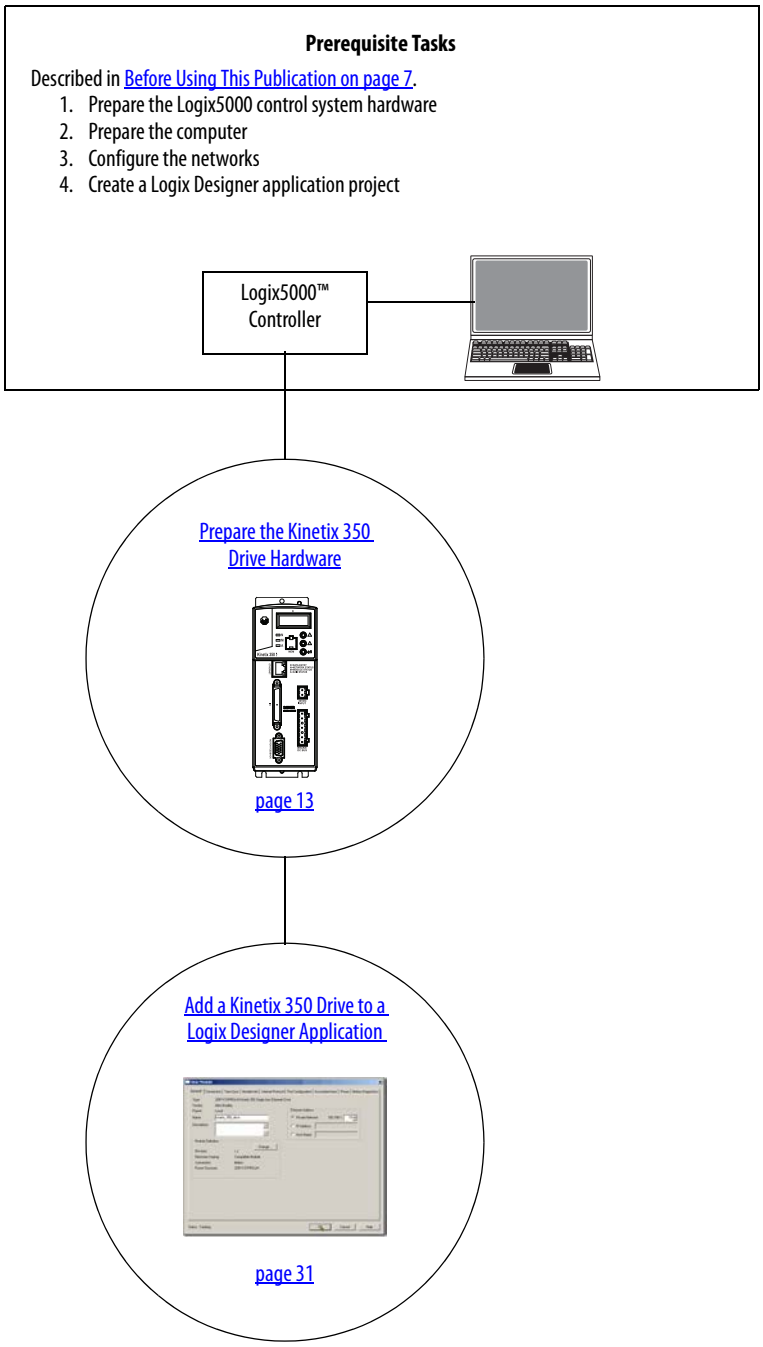
Follow this path to connect a Kinetix® 350 Drive over an EtherNet/IP Network.



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About This Publication

This quick start provides examples and procedures for integrating a Kinetix 350 drive into any Logix5000 control system over an EtherNet/IP network. The programming examples are not complex, and offer easy solutions to verify that devices function and communicate properly.

IMPORTANT This publication describes basic **example tasks that you can** complete when using a Kinetix 350 drive over an EtherNet/IP network. The tasks that are described are **not** the only tasks you can complete with the drive on an EtherNet/IP network. You will likely need to complete additional tasks when using a Kinetix 350 drive in a specific Logix5000 control system.

Before Using This Publication

You can only complete the tasks in this publication after you first complete some prerequisite tasks with a Logix5000 controller. For example, you cannot add a Kinetix 350 drive to a Logix Designer application project (as described on page 31), until you first create the project in a Logix5000 controller.

IMPORTANT The example graphics that are shown in Table 1 - Required Tasks to Complete before Using This Quick Start on page 7 are for CompactLogix™ 5370 L3 controllers. Depending on the Logix5000 controller you use, the specific steps to complete the tasks described in the table can vary.

For more information on how to complete these tasks with specific Logix5000 controllers, see the Integrated Architecture®: Logix5000 Control Systems Quick Starts Quick Reference, publication IASIMP-QR024.

Table 1 - Required Tasks to Complete before Using This Quick Start

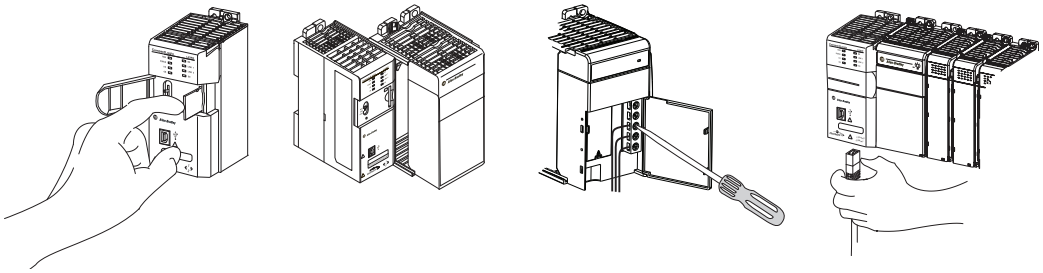
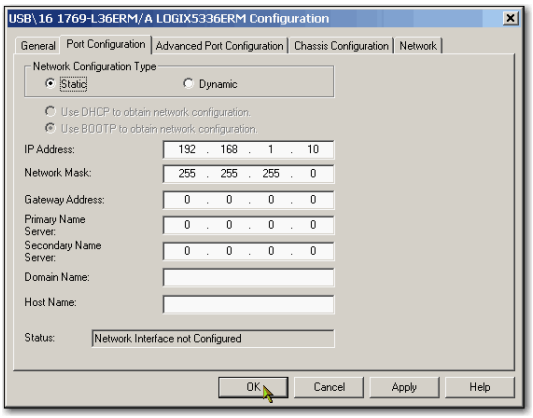
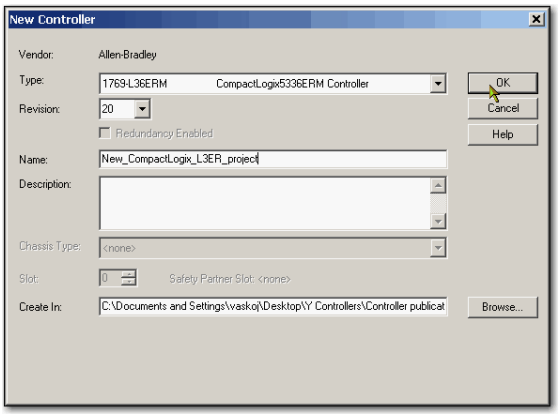
Task	Description
Prepare the Logix5000 control system hardware	Assemble the control system and connect to necessary communication networks. Some components, for example, the Logix5000 controller and system power supply, are required. Other components, for example, a network communication module, are optional. These example graphics show the assembly of one Logix5000 controller.  **IMPORTANT**: This task excludes installation of specific hardware components, for example, Kinetix 350 drives, used over the networks included in your application.

Table 1 - Required Tasks to Complete before Using This Quick Start

Task	Description
Prepare the computer	Install the required software on your computer. The Studio 5000™ Engineering and Design Environment combines engineering and design elements into a common environment. The first element in the Studio 5000 environment is the Logix Designer application. Logix Designer is the rebranding of RSLogix™ 5000 software. Logix Designer is the product to program Logix5000 controllers for discrete, process, batch, motion, safety, and drive-based solutions. The Studio 5000 environment is the foundation for the future of Rockwell Automation® engineering design tools and capabilities. It is the one place for design engineers to develop all the elements of their control system.
Configure the networks	Assign an IP address to the controller communication port or communication module in your Logix5000 control system. Complete other required tasks that are associated with the networks used in your application. 
Create a Logix Designer application project	Create a project to be used with your Logix5000 controller. A project includes all desired control system components and necessary programming. For example, add ladder logic to test tasks associated with individual system components. 

Other Logix5000 Control System Quick Starts

This quick start describes how to use one device on one network in a Logix5000 control system. Typically, though, a Logix5000 control system includes more than the controller and one device on one network.

For example, a Logix5000 control system that operates on an EtherNet/IP network can have:

- Controller
- Power supply
- Communication modules
- Remote I/O modules
- Drives
- HMI terminals

Other quick starts describe how to use different devices on different networks in Logix5000 control systems. For more information, see the Integrated Architecture: Logix5000 Control Systems Quick Starts Quick Reference, publication IASIMP-QR024.

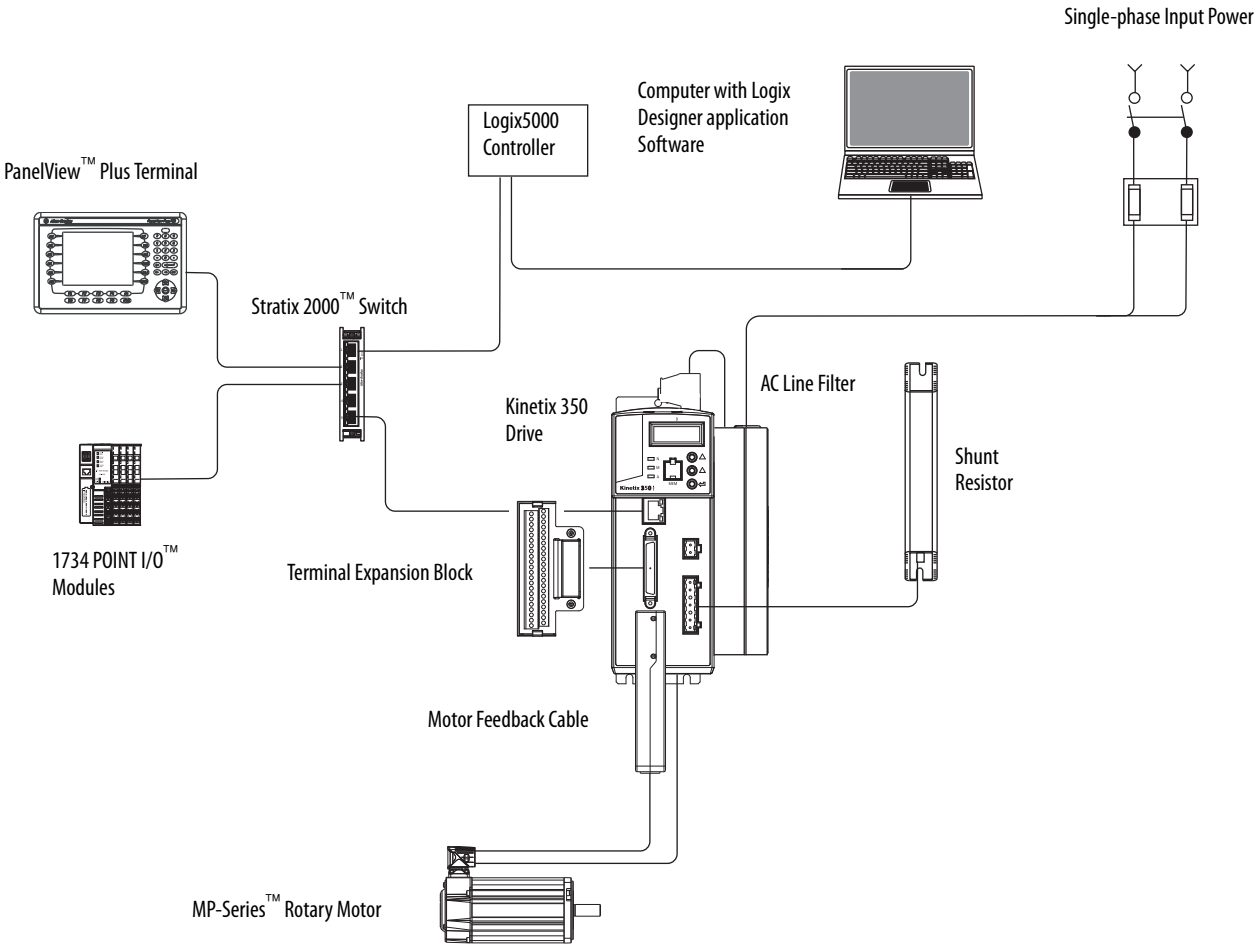
Use Each Chapter

The beginning of each chapter contains the following information. Read these sections before you start work in each chapter:

- **Before You Begin** - This section lists the tasks that you must complete before starting the chapter.
- **What You Need** - This section lists the tools that are required to complete the tasks in the chapter.
- **Follow These Steps** - This section illustrates the steps in the current chapter.

How Hardware is Connected

This graphic shows an example control system that uses a Kinetix 350 drive.



Required Software

To complete examples in **this quick start**, you need Logix Designer application software. Logix Designer application software is required to create or change Logix Designer application projects that use Kinetix 350 drives.

IMPORTANT	This quick start uses Logix Designer application software, version 21.00.00 or later. The example Logix5000 controller, and associated tasks, described in this quick start are completed in a CompactLogix 5370 L3 control system. CompactLogix 5370 L3 control systems require Logix Designer application software, version 21.00.00 or later. If you connect a Kinetix 350 drive over an EtherNet/IP network in a Logix5000 control system that uses a different Logix 5000 controller, then the minimum version of Logix Designer application software can differ.

Parts List

You need these parts to complete the tasks in this quick start.

✓	Quantity	Cat. No.	Description
	1	2097-V31PR2-LM	Kinetix 350 Single Axis Ethernet/IP Servo Drive
	1	MPL-A310P-MJ72AA	MP-Series Low-inertia Servo Motor
	1	The connectors required to use Kinetix 350 drives vary by drive catalog number. The specific connectors to be used with your 2097-V31PR2-LM drive ship with the drive. You do not need to order this part separately.	6-pin Safe Torque Off (STO) Connector
	1		6-pin Motor Power (MP) Connector
	1		24V DC Back-up Power (BP) Connector
	1		4- pin General-purpose AC Input Power (IPD) Connector
	1	2097-TB1	Bulletin 2097 I/O Terminal Expansion Block - 50-pin SCSI I/O (IOD) Connector
	1	2090-CPWM7DF-16AA03	6-pin Standard Power Cable with SpeedTec DIN Connector Type 923
	1	2090-CFBM7DD-CEAA03	Standard Feedback Cable with SpeedTec DIN Connector Type 623
	1	1585J-M8PBJM-2	RJ45 to RJ45 patchcord Ethernet cables
	3		Jumper wires

For each prerequisite task in Table 1 - Required Tasks to Complete before Using This Quick Start on page 7, parts lists are included in the documentation that is associated with the task.

Additional Resources

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

Resource	Description
Kinetix 350 Single-axis EtherNet/IP Servo Drives User Manual, publication 2097-UM002	Describes how to install, wire, configure, operate, and troubleshoot your Kinetix 350 drive.
Kinetix 350 Single-axis EtherNet/IP Servo Drives Installation Instructions, publication 2097-IN008	Describes how to install and wire your Kinetix 350 drive.
EtherNet/IP Modules in Logix5000 Control Systems, publication ENET-UM001	Describes how to install, configure, and operate EtherNet/IP modules.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Notes:

Prepare the Kinetix 350 Drive Hardware

In this chapter, you learn how to complete the following tasks:

- Mount a 2097-V31PR2-LM drive.
- Make multiple connections, for example, power, feedback and resistor connections to the drive.
- Configure EtherNet/IP communication for the drive.

Before You Begin

Before using this chapter, you must complete the tasks that are listed in Before Using This Publication on page 7:

- Prepare the Logix5000 control system hardware
- Prepare the computer
- Configure the networks - The tasks in this chapter require an EtherNet/IP network.
- Create a Logix Designer application project

  The example Logix Designer project that you create in this chapter uses a CompactLogix 5370 L3 controller.

What You Need

Use these products to complete the tasks in this chapter.

✓	Quantity	Cat. No.	Description
	1	2097-V31PR2-LM	Kinetix 350 Single Axis Ethernet/IP Servo Drive
	1	MPL-A310P-MJ72AA	MP-Series Low-inertia Servo Motor
	1	The connectors that you are required to use with Kinetix 350 drives vary by drive catalog number. The specific connectors to be used with your 2097-V31PR2-LM drive ship with the drive. You do not need to order this part separately.	6-pin Safe Torque Off (STO) Connector
	1		6-pin Motor Power (MP) Connector
	1		24V DC Back-up Power (BP) Connector
	1		4- pin General-purpose AC Input Power (IPD) Connector
	1	2097-TB1	Bulletin 2097 I/O Terminal Expansion Block - 50-pin SCSI I/O (IOD) Connector
	1	2090-CPWM7DF-16AA03	6-pin Standard Power Cable with SpeedTec DIN Connector Type 923
	1	2090-CFBM7DD-CEAA03	Standard Feedback Cable with SpeedTec DIN Connector Type 623
	1	1585J-M8PBJM-2	RJ45 to RJ45 patchcord Ethernet cables
	3		Jumper wires

Follow These Steps

Prepare the Panel

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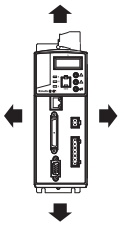
Mount the Kinetix 350 Drive



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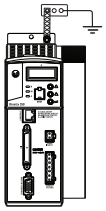
Ground the Kinetix 350 Drive



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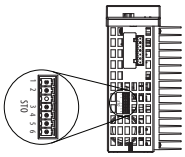
Disable the Safe Torque-off Feature



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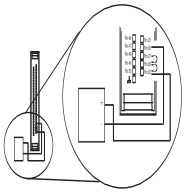
Wire the IOD Connector



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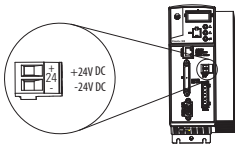
Wire the Back-up Power Connector



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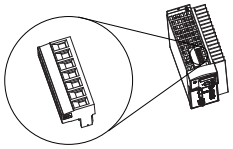
Wire the Input Power Connector



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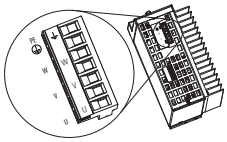
Wire the Motor Power Connector



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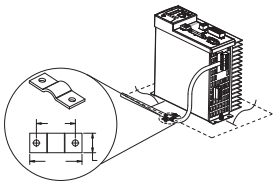
Apply the Motor Cable Shield Clamp



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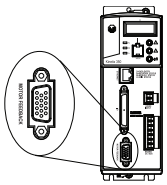
Wire the Motor Feedback Connector



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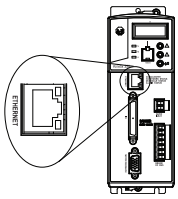
Connect the Kinetix 350 Drive to the EtherNet/IP Network



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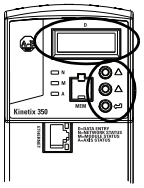
Assign an IP Address to the Kinetix 350 Drive



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Prepare the Panel

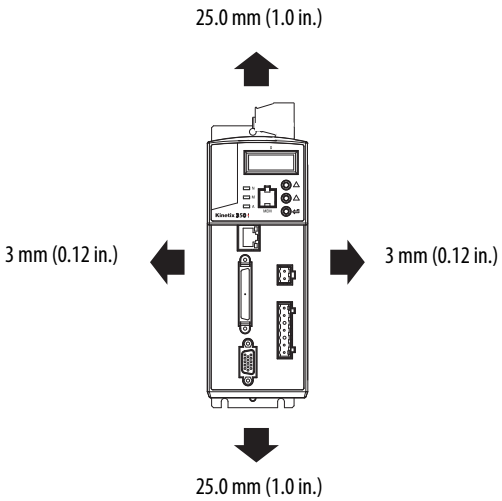
You must install the 2097-V31PR2-LM drive on a grounded panel. This quick start assumes that you installed a panel when you installed the Logix5000 control system hardware (see Prepare the Logix5000 control system hardware on page 7).

- If you have already installed a painted, grounded panel, move to section Mount the Kinetix 350 Drive.
- If you have not already installed a painted, grounded panel, do so before proceeding to the next section.

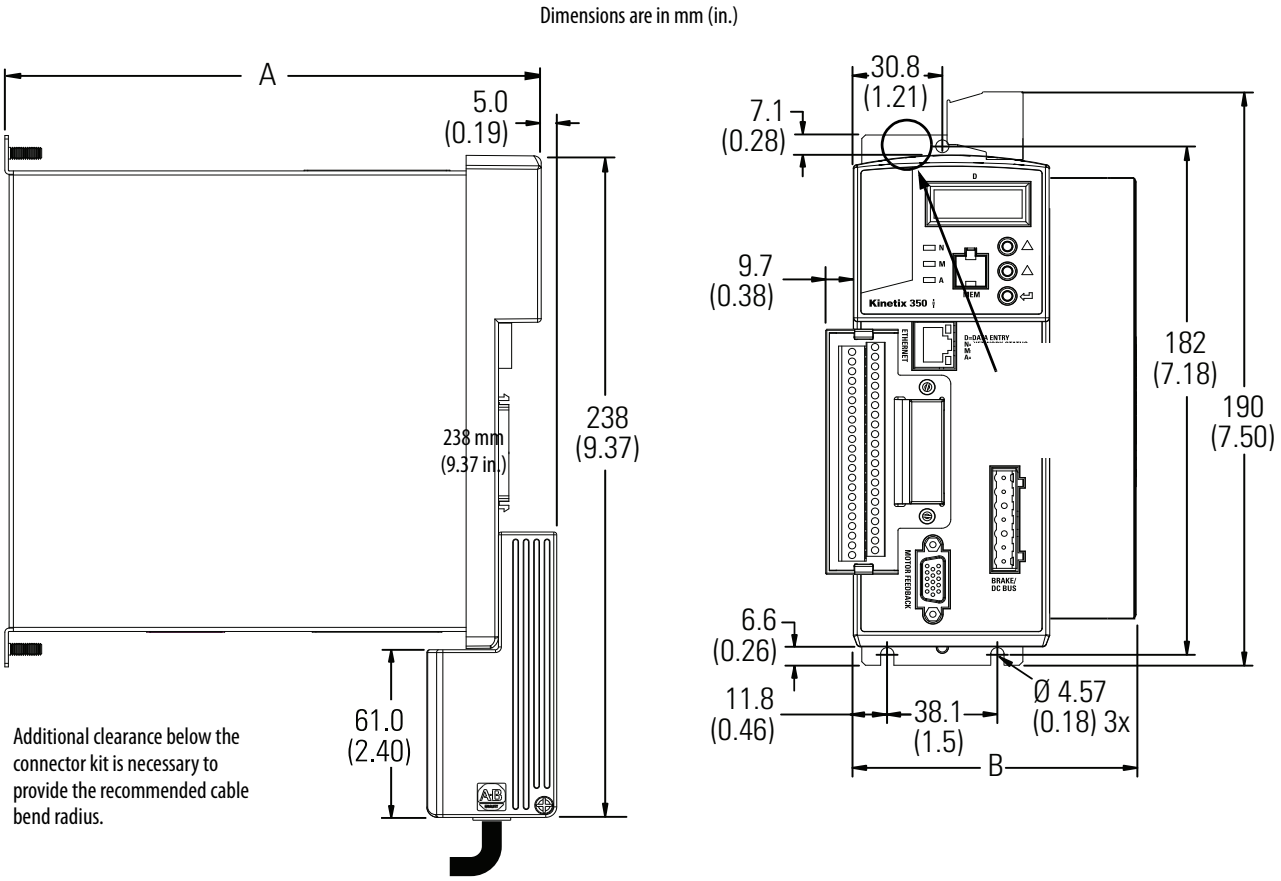
  For information on how to install a panel for use with a Kinetix 350 drive, see the Kinetix 350 Single-axis EtherNet/IP Servo Drives User Manual, publication 2097-UM002.

Mount the Kinetix 350 Drive

1. Verify that you have at least the minimum clearance to mount your 2097-V31PR2-LM drive on the panel.



2. This graphic shows the drive dimensions so you can make sure that your mounting holes are in the correct location.

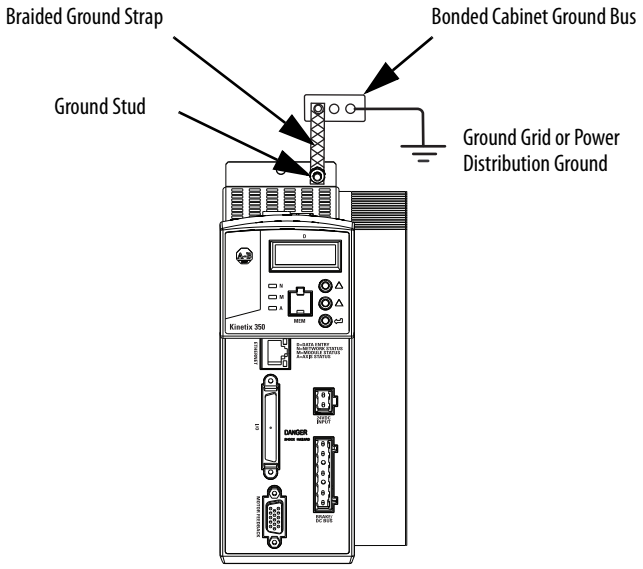


3. Attach the drive to the cabinet using M4 (#6-32) steel machine screws torqued to 1.1 N•m (9.8 lb•in). Begin with the upper mounting slots, and then the lower slots.

4. Tighten all mounting fasteners.

Ground the Kinetix 350 Drive

Use a braided ground strap or 4.0 mm^2 (12 AWG) solid copper wire 100 mm (3.9 in.) long to ground the 2097-V31PR2-LM drive to the bonded cabinet ground bus, as shown.



Disable the Safe Torque-off Feature

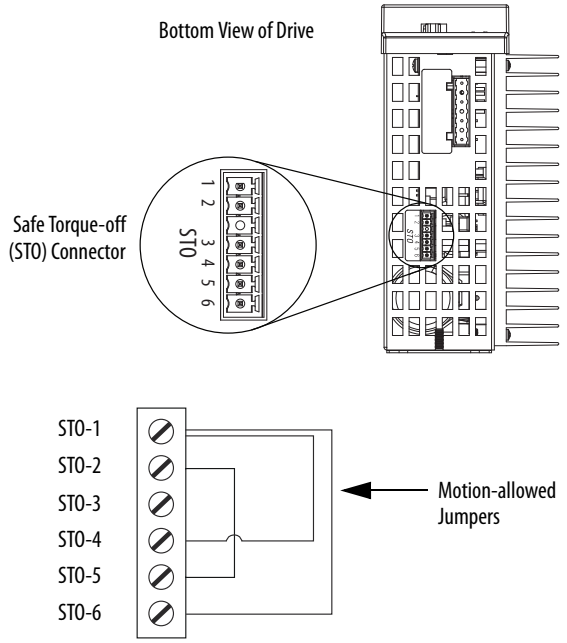
The safe torque-off feature is used in applications that are used in safety conditions. This feature safely removes power from the gate firing circuits of the drives output power devices (IGBTs). The feature is enabled by default when the Kinetix 350 drive ships from the factory.

If your application used in this quick start does not require the use of safety options, you can disable the safe torque-off feature. You use jumper wires, as shown, to disable the safe torque-off feature. The tasks in this quick start are not completed in an environment that includes safety conditions, so you can disable the safe torque-off feature.

IMPORTANT For more information about using the safe torque-off feature in an environment that includes safety conditions, see the Kinetix 350 Single-axis EtherNet/IP Servo Drive User Manual, publication 2097-UM002.

Complete these steps to disable the safe torque-off feature.

1. Remove the STO connector from the drive.
2. Install STO Motion-allowed jumpers at the termination points as shown.
3. Insert the STO connector into the bottom of the drive.



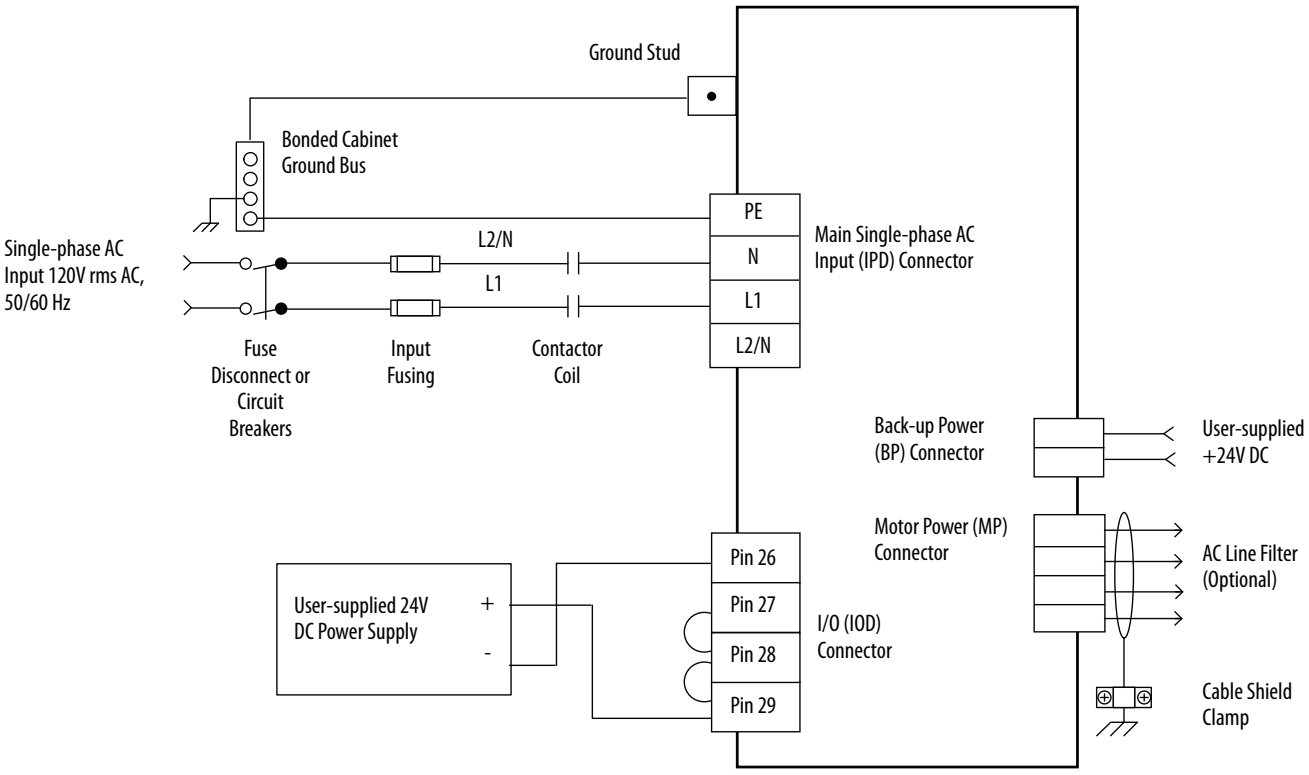
Wiring Diagram

You can wire 120V or 240V single-phase input power to your Kinetix 2097-V31PR2-LM drive. When completing the tasks described in this quick start, you use 120V single-phase power.

The following graphic shows how to wire connectors on your Kinetix 2097-V31PR2-LM drive for 120V single-phase power. More detailed descriptions of how to wire each connector are included later in this chapter.

IMPORTANT Keep in mind, the **following graphic does not show** all possible connections to your Kinetix 2097-V31PR2-LM drive. It only describes the connections that are required to complete the tasks in this quick start.

For more complete information on how to wire your Kinetix 350 drive see the Kinetix 350 Single-axis EtherNet/IP Servo Drives User Manual, publication 2097-UM002.



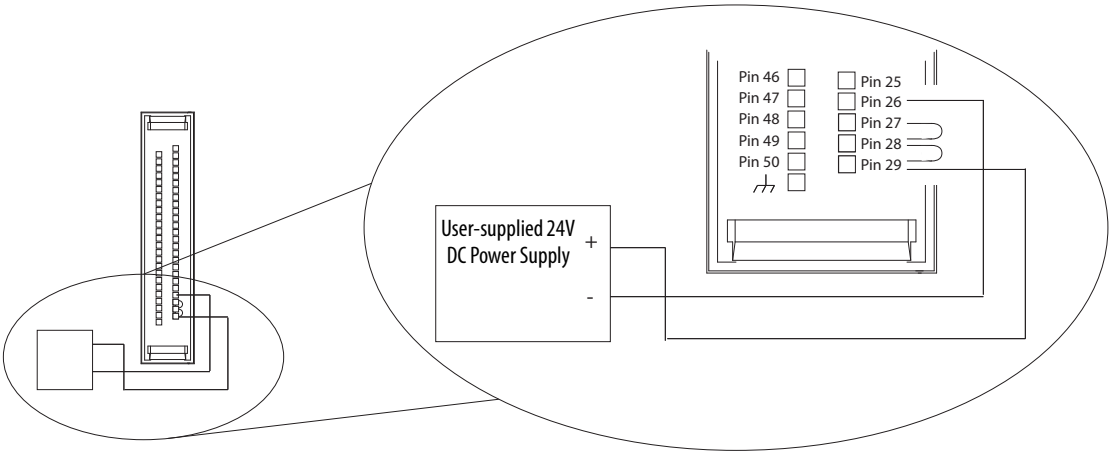
Wire the IOD Connector

Certain tasks in this quick start execute drive actions, such as the Hookup test described on Test the Axis on page 44. You must also wire the 2097-TB1 I/O terminal expansion block so you can complete the tasks that execute drive actions.

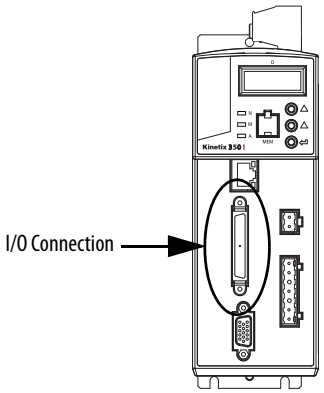
The 2097-V31PR2-LM drive ships from the factory with the drive ENABLE functionality enabled. To use your Kinetix drive with the drive ENABLE functionality in the enabled state, connect a user-supplied, external 24V DC power supply to the drive via the IOD connector.

Complete these steps to use the IOD connector.

1. Verify the user-supplied, external power supply is not powered.
2. Connect a wire from a -24V DC terminal on the external power supply to pin 26 (+/- Overtravel, enable and home common) on the IOD connector.
3. Jumper a wire from pin 27 (Negative hardware overtravel) to pin 28 (Positive hardware overtravel) on the IOD connector.
4. Jumper a wire from pin 28 (Positive hardware overtravel) to pin 29 (Drive enable) on the IOD connector.
5. Connect a wire from a +24V DC terminal on the external power supply to pin 29 (ENABLE signal) on the IOD connector.



6. Insert the IOD connector into the I/O connection on the front of the drive.

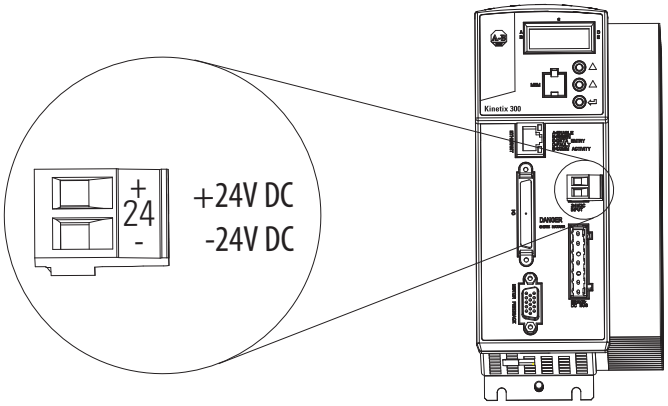


IMPORTANT Do not connect power to the external power supply.

Wire the Back-up Power Connector

You need a user-supplied, external 24V DC power supply to provide back-up power to the drive. Complete these steps to wire the BP connector.

1. Verify the user-supplied, external power supply is not powered.
2. Remove the BP connector from the BP connection on the drive.
3. Remove approximately 6 mm (0.25 in.) insulation from two 1.5 mm^2 (16 AWG) copper wires.
4. Connect a wire from a +24V DC terminal on the external power supply to the +24V DC terminal on the BP connector.
5. Connect a wire from a -24C DC terminal on the external power supply to the -24V DC terminal on the BP connector.
6. Insert the BP connector into the BP connection on the drive.



IMPORTANT Do not connect power to the external power supply.

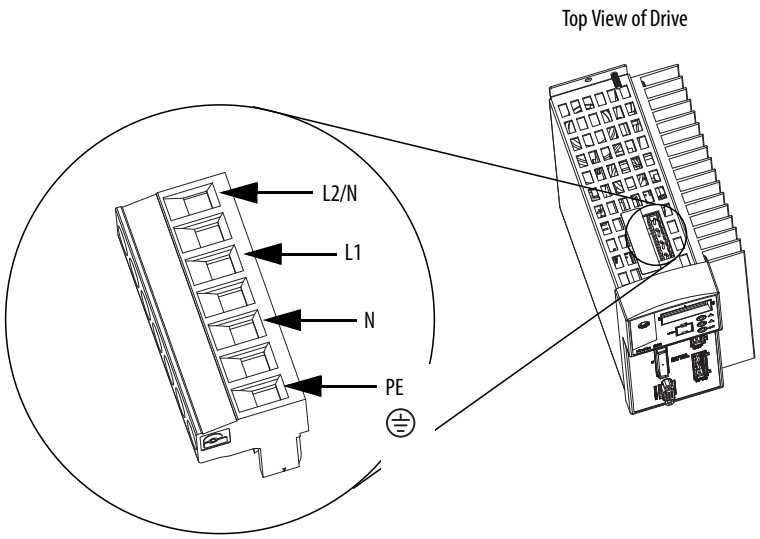
Wire the Input Power Connector

You can use a 120V AC or 240V DC power source to connect input power to the 2097-V31PR2-LM drive via the IPD connector. In this quick start, we describe how to connect a 120V AC power source to the drive.

Complete these steps to wire the IPD connector.

1. Verify that the 120V AC power source is not powered.
2. Remove the IPD connector plug from the top of the drive.
3. Remove approximately 7 mm (0.28 in.) insulation from four 2.5 mm^2 (14 AWG) copper wires.
4. Insert the wires from the 120V AC power source cable into the IPD connector positions according to the following table.

Power Cable Wire	Terminal
Black	L1
White	N
Green	PE ⏚



   The L2/N connector is not used when you connect input power from a 120V AC power source.

5. Insert the connector plug into the Input Power (IPD) connector on the top of the drive.

IMPORTANT Do not connect power to the external power supply.

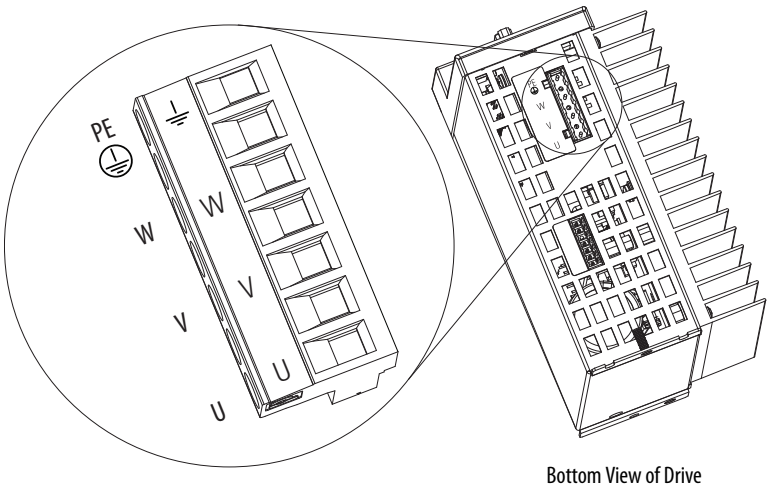
Wire the Motor Power Connector

This publication uses a 2090-CPWM7DF-16AA03 standard power cable with SpeedTec DIN connector type 923 to wire power from the 2097-V31PR2-LM drive to the motor.

Complete these steps to wire the power cable to the MP connector.

1. Remove the MP connector from the bottom of the drive.
2. Remove approximately 7 mm (0.28 in.) insulation from four 2.5 mm^2 (14 AWG) copper wires.
3. Insert the wires into the appropriate connector positions according to the following table.

MP-Series Servo Motor Wire	Terminal
Green/yellow ⏚	PE ⏚
W/Blue	W
V/Black	V
U/Brown	U



Bottom View of Drive

4. Insert the MP connector into the MP Connection on the bottom of the drive.
5. Connect the other end of the 2090-CPWM7DF-16AA03 cable to the motor.

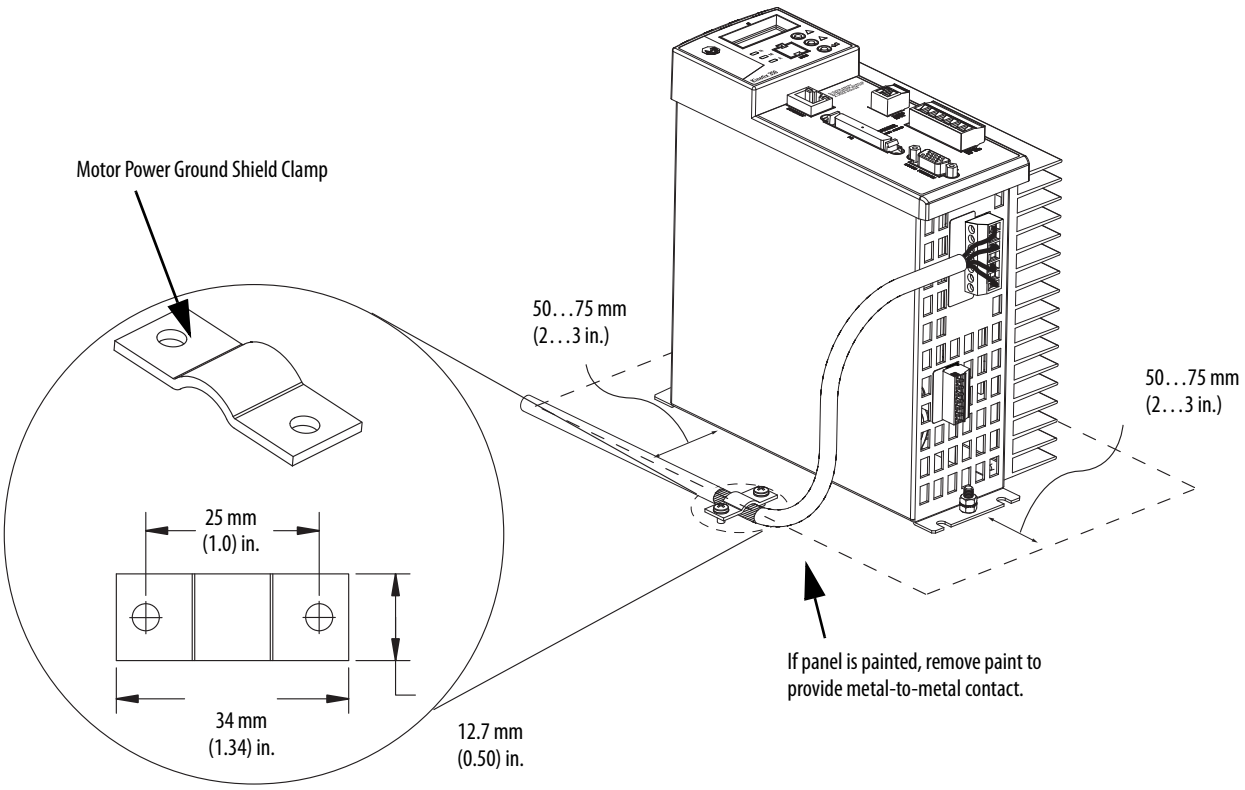
Apply the Motor Cable Shield Clamp

Complete these steps to apply the motor cable shield clamp.

1. Locate a position for installing the cable shield clamp within 50...75 mm (2...3 in.) of the drive.
2. Lay out and drill holes for the cable clamp.

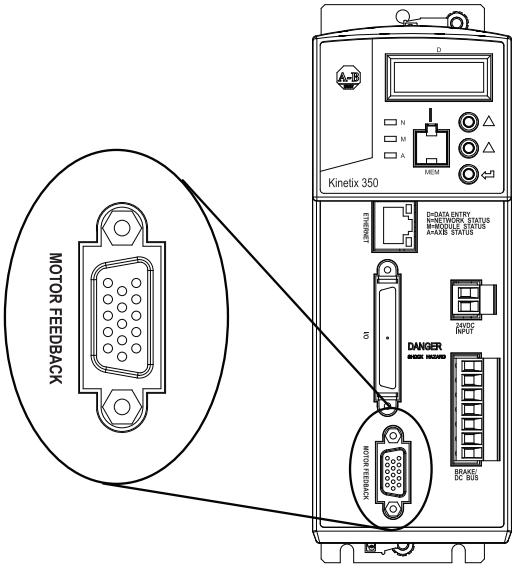
> **ATTENTION:** Plan the installation of your system so that you can cut, drill, tap, and weld with the system removed from the enclosure. Because the system is of the open type construction, be careful to keep any metal debris from falling into it. Metal debris or other foreign matter can become lodged in the circuitry, which can result in damage to components.

3. Locate the position on the motor power cable that comes under the clamp and remove about an inch of the cable jacket to expose the shield braid.
4. Position the exposed portion of the cable braid directly in line with the clamp.
5. Clamp the exposed shield to the panel by using the clamp and two #6-32 x 1 screws that are provided with your drive.



Wire the Motor Feedback Connector

This publication describes how to use a 2090-CFBM7DD-CEAA03 standard feedback cable with SpeedTec DIN connector type 623 to wire feedback from the motor to the drive.



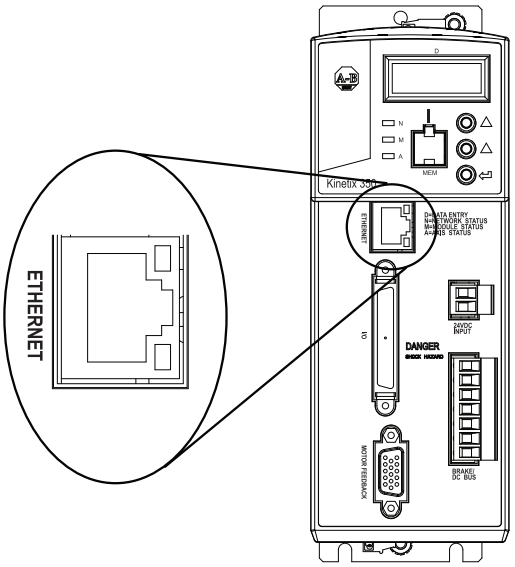
Complete these steps to wire the MF connector.

1. Plug the premolded feedback cable into the MF connector on the front of the drive.
2. Tighten the fastening screws at the top and bottom of the motor feedback connector to secure the connection.
3. Connect the other end of the cable to the MPL-A310P-MJ72AA motor.

Connect the Kinetix 350 Drive to the EtherNet/IP Network

Complete these steps to connect the 2097-V31PR2-LM drive to the EtherNet/IP network.

1. Connect one end of the 1585J-M8PBJM-2, RJ45 to RJ45 patchcord Ethernet cables to the Ethernet connector on the front of the Kinetix 350 drive.

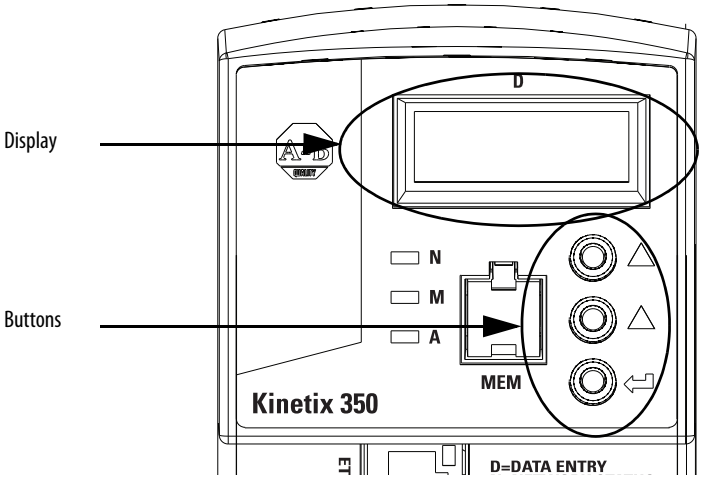


2. Connect the other end of the Ethernet cable to the EtherNet/IP network.

Assign an IP Address to the Kinetix 350 Drive

You can assign an IP address to the 2097-V31PR2-LM drive manually via the drive keypad or dynamically via a DHCP-enabled server. Because this publication describes tasks that are intended to be completed on a private network, you assign an IP address via the drive keypad.

The graphic shows which buttons on the keypad to use to change settings on the drive.



Before assigning the IP address manually, disable DHCP mode.

IMPORTANT If you do not disable DHCP mode before assigning the IP address, then the drive loses the assigned IP address the next time power is cycled to the drive.

Complete these steps to assign an IP address to your 2097-V31PR2-LM drive.

1. Apply power to the drive via the 120V AC power source that is described in Wire the Input Power Connector on page 23.

   Do not apply power to the BP connector yet.

2. Press .

3. Use to access parameter DHCP.

   The display indicates each parameter as you use the up/down arrows to scroll all options.

4. Press .

5. Check this parameter is set to a value of 0.

6. If the DHCP parameter is set to 1, then use and to set to 0.

7. Cycle power to the drive.

The change takes effect. Unless DHCP mode is enabled in the future, each time power is cycled to the drive, it uses the IP address that was manually assigned.

Your 2097-V31PR2-LM drive ships from the factory with its IP address set at 192.168.124.200. To complete the tasks in this quick start, you must **change the IP address to 192.168.1.5**.

Complete these steps to assign an IP address for your drive.

1. Press .
2. Use to access parameter IP_1.
3. Press .
4. Use to set the value for parameter IP_1.
5. Press .
6. Repeat step 1 through step 5 to change the values for the remaining IP address parameters, that is, IP_2, IP_3 and IP_4.
7. Cycle power to the drive.
8. Apply back-up power to the drive via the BP connector.

Additional Resources

For a list of additional resources that can assist you when preparing the Kinetix 350 drive hardware, see page 11.

Notes:

Add a Kinetix 350 Drive to a Logix Designer Application Project

In this chapter, you learn how to complete the following tasks:

- Add a 2097-V31PR2-LM drive to a Logix Designer application project and configure it.
- Download the project to the controller.
- Apply power to the drive and test an axis to verify communication with the drive.

Before You Begin

You must complete these tasks before using this chapter:

- The tasks that are described in Before Using This Publication on page 7, include the following:
  - Prepare the Logix5000 control system hardware
  - Prepare the computer
  - Configure the networks - The tasks in this chapter require an EtherNet/IP network.
  - Create a Logix Designer application project

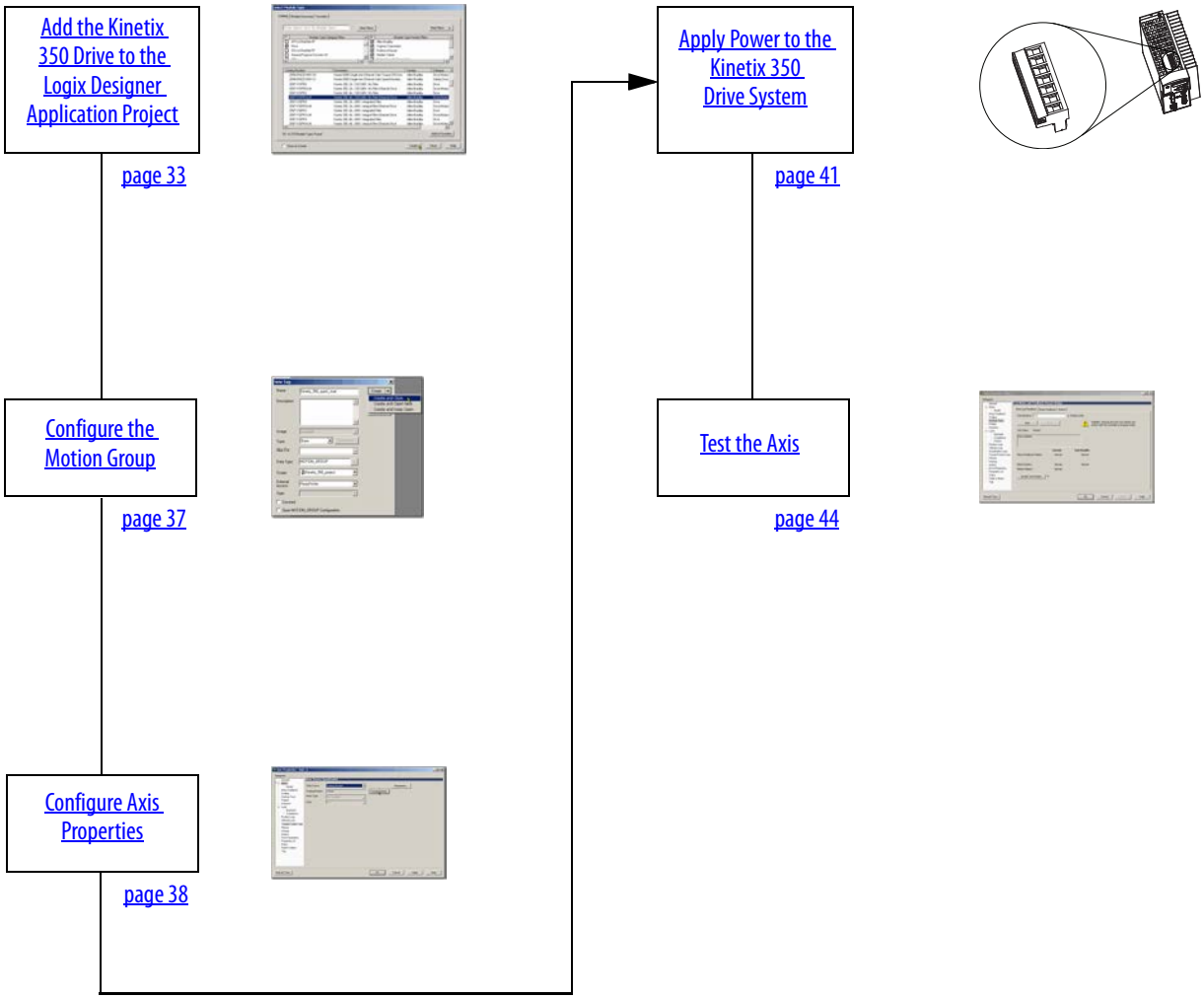
  The example Logix Designer project that you create in this chapter uses a CompactLogix 5370 L3 controller.

- The tasks in Chapter 1, Prepare the Kinetix 350 Drive Hardware on page 13, include the following:
  - Prepare the Panel
  - Mount the Kinetix 350 Drive
  - Ground the Kinetix 350 Drive
  - Disable the Safe Torque-off Feature
  - Wire the Back-up Power Connector
  - Wire the Input Power Connector
  - Wire the Motor Power Connector
  - Apply the Motor Cable Shield Clamp
  - Wire the Motor Feedback Connector
  - Connect the Kinetix 350 Drive to the EtherNet/IP Network
  - Assign an IP Address to the Kinetix 350 Drive

What You Need

You need Logix Designer application software to complete the tasks in this chapter.

Follow These Steps

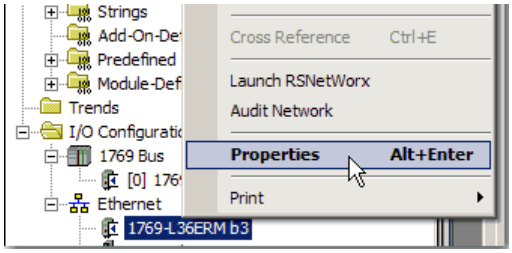


Add the Kinetix 350 Drive to the Logix Designer Application Project

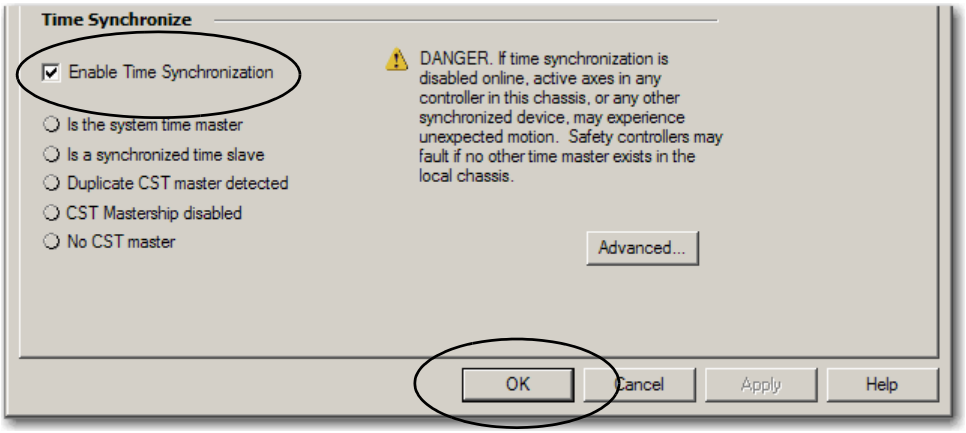
IMPORTANT The tasks in this section use a Logix Designer application project for a CompactLogix 5370 L3 controller. CompactLogix 5370 L3 controllers require that you use Logix Designer application software, version 21.00.00 or later.

If you are using a different Logix5000 controller, your project's version requirement might be different.

1. Verify that the 2097-V31PR2-LM drive is not powered at the IPD connector nor the BP connector.
2. In your project, right-click the controller, and choose Properties.

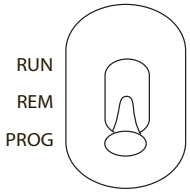


3. Click the Date/Time tab.
4. Verify that Enable Time Synchronization is checked, and click OK.

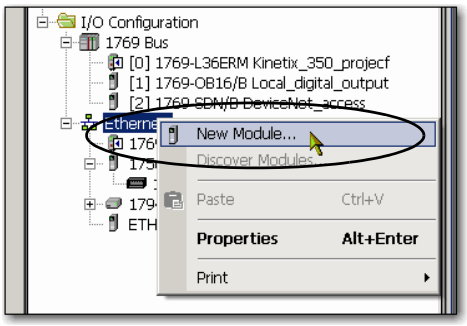


5. Save your project.
6. When asked to upload online tags, click Yes.
7. Go offline.

8. Verify the Logix5000 controller mode switch is in the PROG mode position.

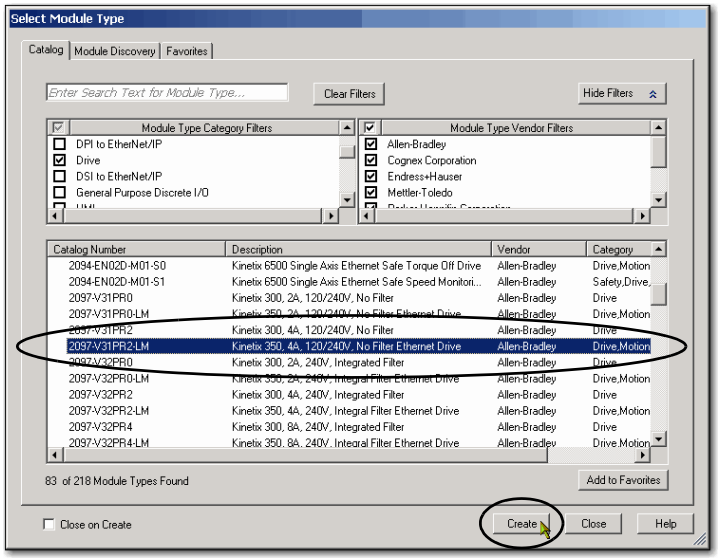


9. Right-click your network port, and choose New Module.



10. Select the Kinetix 350 drive, and click Create.

    The Select Module Type dialog box may appear differently depending on which Logix5000 controller your application uses and, thus, what version of Logix Designer application software is used.



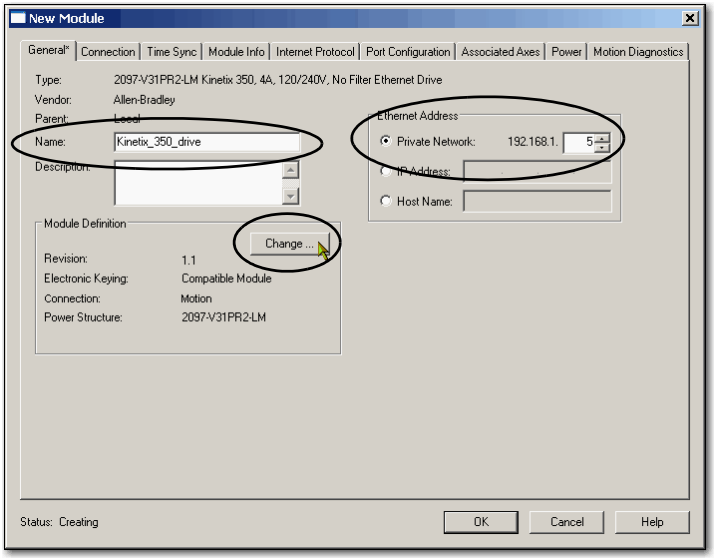
The New Module dialog box appears.

11. Configure the new drive.
    a. Type the drive Name.
    b. Click an Ethernet Address option.

       In this example, the Ethernet Address is Private Network.

    c. Enter the IP address of your EtherNet/IP drive.

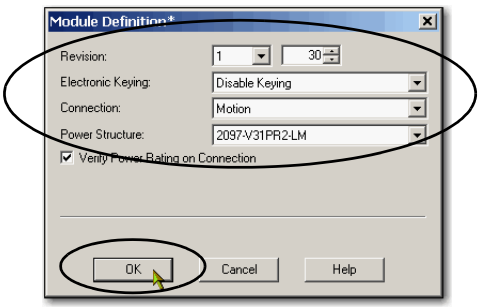
       The IP address must match the IP address you assigned in Assign an IP Address to the Kinetix 350 Drive on page 28.



12. In the Module Definition area, click Change.

    The Module Definition dialog box opens.

13. From the Revision pull-down menus, enter the firmware revision.

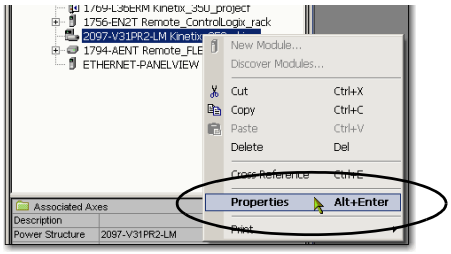


14. From the Electronic Keying pull-down menu, choose Disable Keying.

IMPORTANT Disable Keying lets you easily complete the tasks in this quick start. In typical applications, we recommend that you avoid using Disable Keying whenever possible.

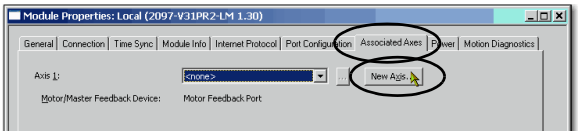
15. Click OK.
16. On the New Module Properties dialog box, click OK.
17. On the Select Module Type dialog box, click Close.

18. Right-click the 2097-V31PR2-LM drive, and choose Properties.



The Module Properties dialog box opens.

19. Click the Associated Axes tab.
20. Click New Axis.



The New Tag dialog box opens.

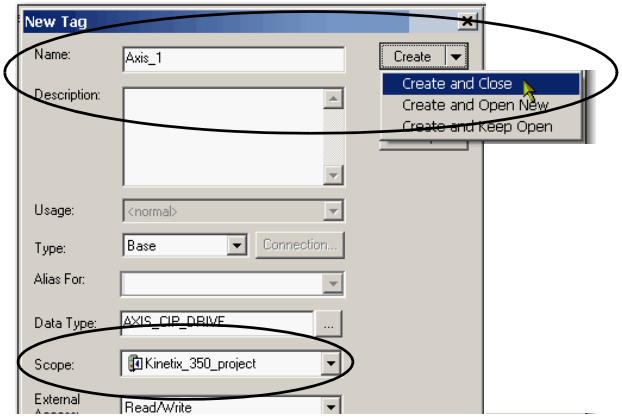
21. Type the axis Name.

AXIS_CIP_DRIVE is the default Data Type.

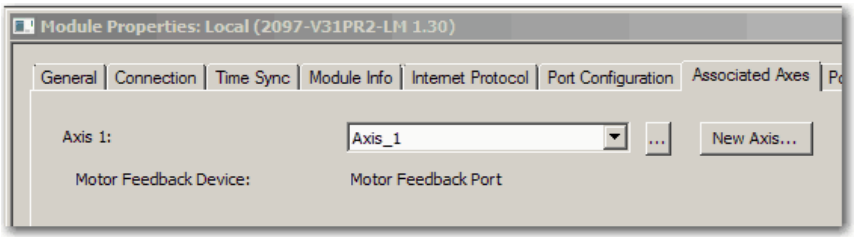
22. Change the Scope to your controller project.

In this case, the Scope is Kinetix_350_project.

23. Click Create and Close.



The new axis appears in the Axis 1: field on the Module Properties dialog box.

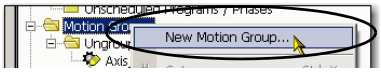


24. On the Module Properties dialog box, click OK.

Configure the Motion Group

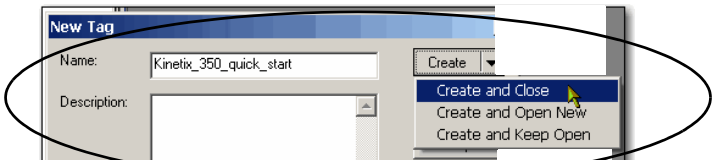
Complete these steps to configure the motion group.

1. Right-click Motion Groups in the Controller Organizer, and choose New Motion Group.



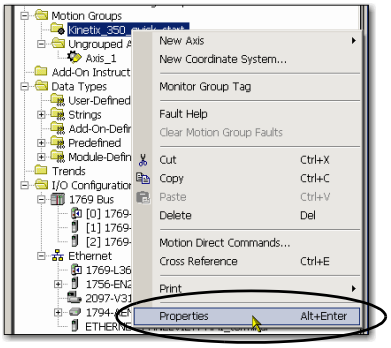
   The New Tag dialog box opens.

2. Type the new motion group Name.
3. Click Create and Close.



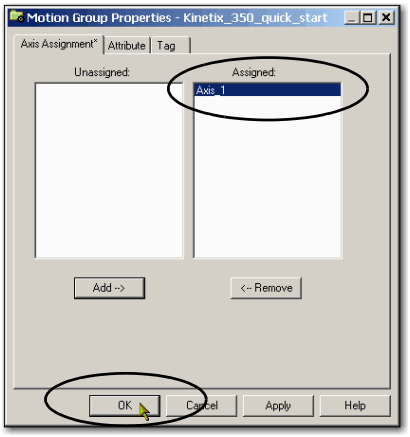
   The new motion group appears under the Motion Groups folder.

4. Right-click the new motion group and choose Properties.



   The Motion Group Properties dialog box opens.

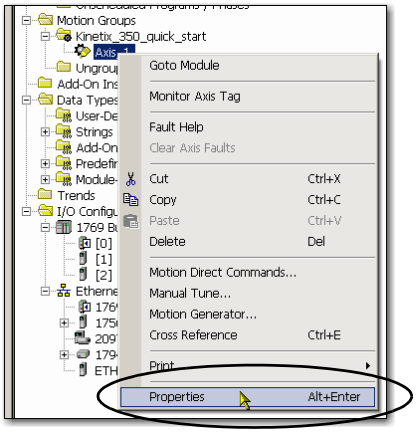
5. Click the Axis Assignment tab.
6. Select the axis that you created.
7. Click Add to move the Axis from Unassigned to Assigned.
8. Click OK.



Configure Axis Properties

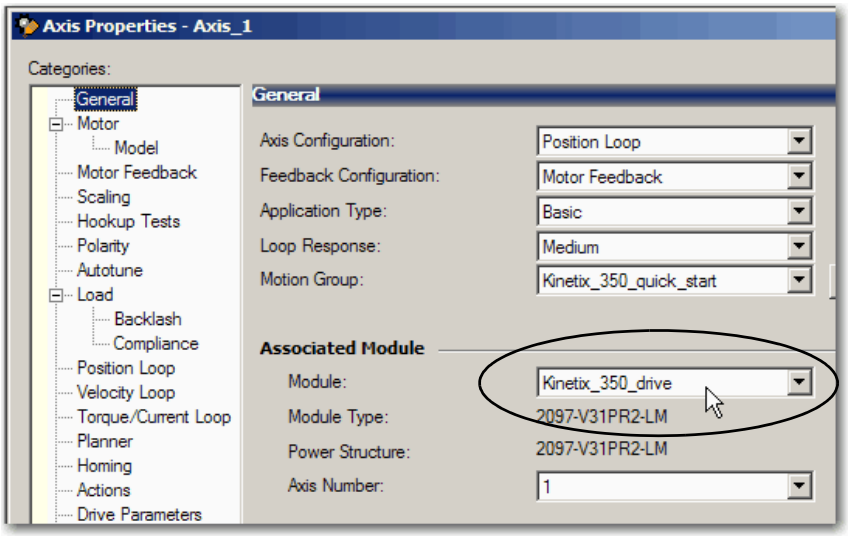
Complete these steps to configure the properties for Axis_1.

1. Right-click Axis_1 in the Controller Organizer and choose Properties.



   The Axis Properties dialog box opens.

2. Click the General category.
3. From the Module pull-down menu, choose Kinetix_350_drive.

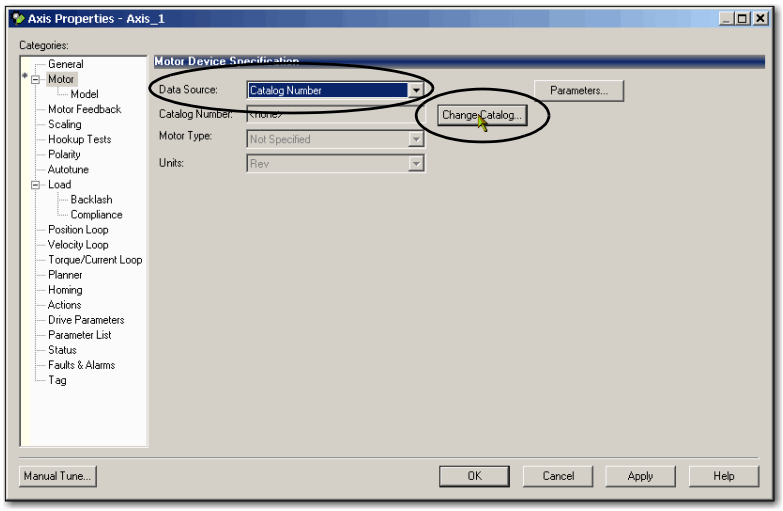


4. Click the Motor category.

   The Motor Device Specification dialog box opens.

5. From the Data Source pull-down menu, choose Catalog Number.

6. Click Change Catalog.

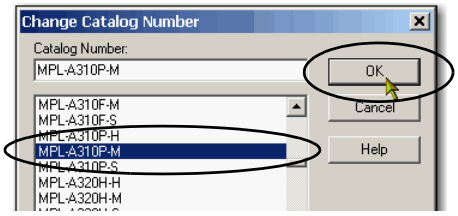


   The Change Catalog Number dialog box opens.

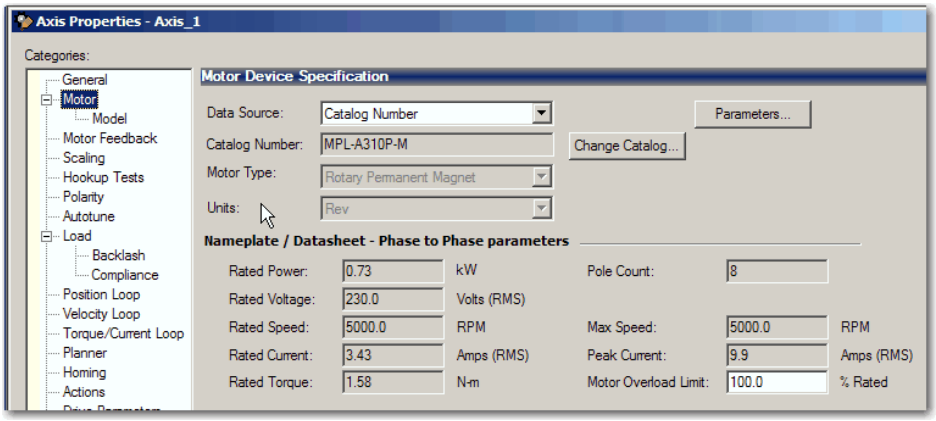
7. Select the motor catalog number.

   This quick start uses the MPL-A310P-MJ72AA, MP-series motor. The correct catalog number to choose is MPL-A310P-M.

8. Click OK to close the Change Catalog Number dialog box.



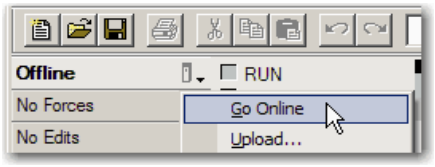
   Motor data specific to your motor appears in the Motor category.



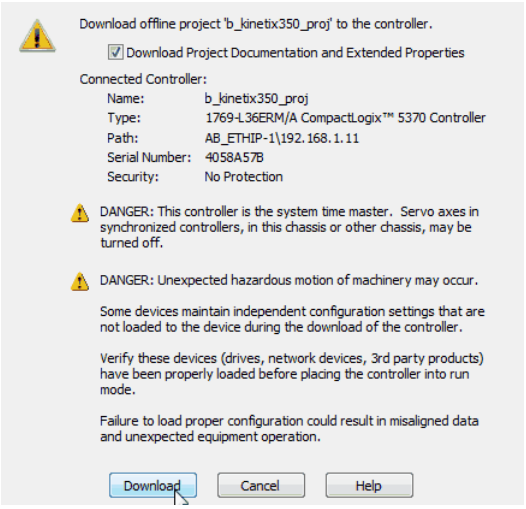
9. On the axis Properties dialog box, click Apply.

   You do not need to change the parameters in the other categories to complete the tasks in this quick start.

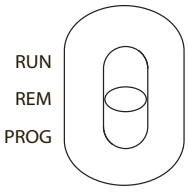
10. On the Axis Properties dialog box, click OK.
11. Save the file.
12. Set your project to Go Online.



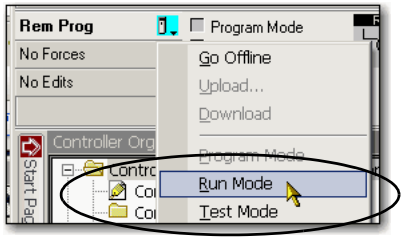
13. When the Connected to Go Online dialog box appears, click Download.
14. On the Download dialog box, click Download.



15. Switch the controller to REM mode.



16. Set your project to Run Mode.



17. When asked to Change controller mode to Remote Run, click Yes.

Apply Power to the Kinetix 350 Drive System

Before beginning this section, verify that you have wired and configured your Kinetix 350 drive and your controller EtherNet/IP network port correctly.

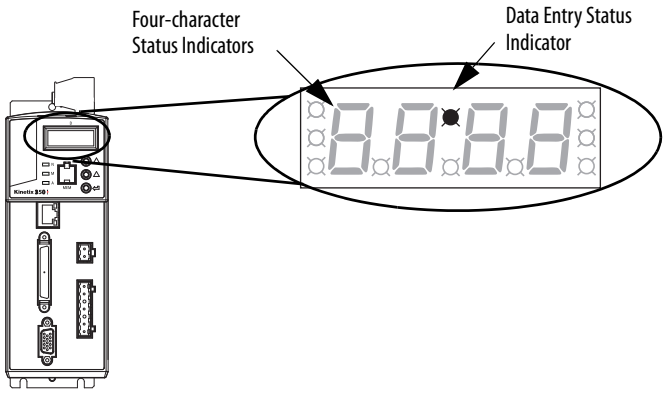
SHOCK HAZARD: To avoid hazard of electrical shock, mount and wire the Bulletin 2097 drive before you apply power.
Once power is applied, connector terminals can have voltage present even when not in use.

Complete these steps to apply power to the Kinetix 350 drive system.

1. Disconnect the load to the MPL-A310P-MJ72AA motor.

   ATTENTION: To avoid personal injury or damage to equipment, disconnect the load to the motor. Make sure that each motor is free of all linkages when you initially apply power to the system.

2. Apply 120V AC main input power to the IPD connector on the 2097-V31PR2-LM drive.
3. Verify that the four-character status indicator is initially 00, and then starts to scroll the IP address of the drive.

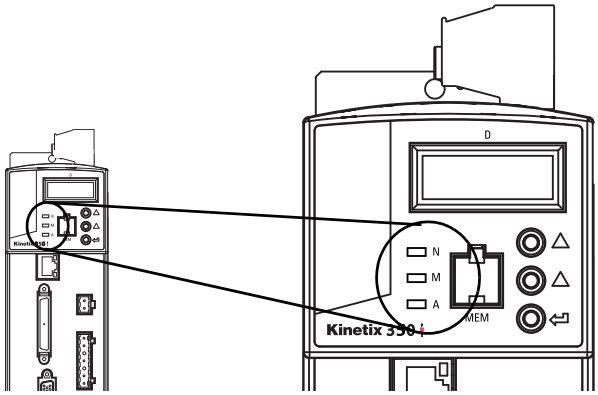


   If so, go ahead to the next step.

   If the status indicator is blank, return to step 2.

4. Apply 24V DC power to the BP connector on the 2097-V31PR2-LM drive.

5. Observe the status indicators on the 2097-V31PR2-LM drive.



The indicators include the following:

- N - Network
- M- Module
- A - Axis

The network and module status indicators must be in the steady green state and the axis status indicator must be in the flashing green state. If the status indicators are not in these states, you must determine what condition is preventing it.

Use the following table to diagnose and correct potential issues with your system.

Table 1 - Drive Status Indicators

Status Indicator	Condition	Status
Network	Off	No power or no IP address.
	Alternating green/red	Self-test mode (power-up diagnostics). Wait for steady green.
	Flashing green	Standby - Drive is either not configured or no connections are established.
	Steady green	Drive is ready for network communication.
	Flashing red	Recoverable minor fault or connection timeout.
	Steady red	Nonrecoverable fault or duplicate IP address.
Module	Off	No power. Apply power.
	Alternating green/red	Self-test mode (power-up diagnostics). Wait for steady green.
	Flashing green	Standby - Drive is either not configured or no connections are established.
	Steady green	Drive is operating correctly.
	Flashing red	Recoverable fault. A four-digit fault message scrolls across the display. For more information on drive faults, see the Kinetix 350 Single-axis EtherNet/IP Servo Drives User Manual, publication 2097-UM002.
	Steady red	Nonrecoverable fault. A four-digit fault message scrolls across the display. For more information on drive faults, see the Kinetix 350 Single-axis EtherNet/IP Servo Drives User Manual, publication 2097-UM002.

Table 1 - Drive Status Indicators

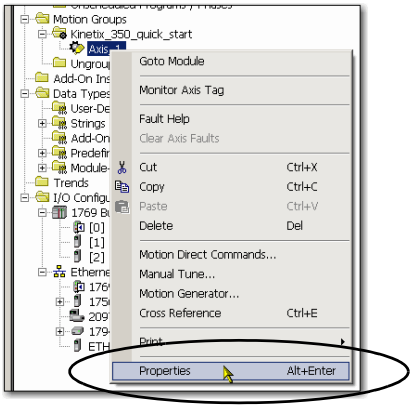
Status Indicator	Condition	Status
Axis	Off	One of the following conditions exists: • Off • Initialization is in process - Bus not operating • Shutdown is in process - Bus not operating • Pre-charge is in process - Bus not operating
	Flashing red/green	Self-test (power-up diagnostics) in process
	Flashing green	One of the following conditions exists: • Initialization is in process- Bus is operating • Axis is stopped.
	Flashing amber	One of the following conditions exists: • Shutdown is in process - Bus is operating • Start is inhibited.
	Steady green	One of the following conditions exists: • Axis is stopping. • Axis is starting. • Axis is running. • Axis is testing.
	Flashing red	One of the following conditions exists: • Axis is aborting. • Axis experienced a major fault.
	Steady red	One of the following conditions exists: • Axis is aborting. • Axis experienced a major fault.

Test the Axis

IMPORTANT This section assumes that the status indicators on the 2097-V31PR2-LM drive show that drive is operating as expected. If the status indicators do not reflect a fully operational drive state, as described in Table 1 on page 42, then use the table to address any issues regarding the drive's state before proceeding with this section.

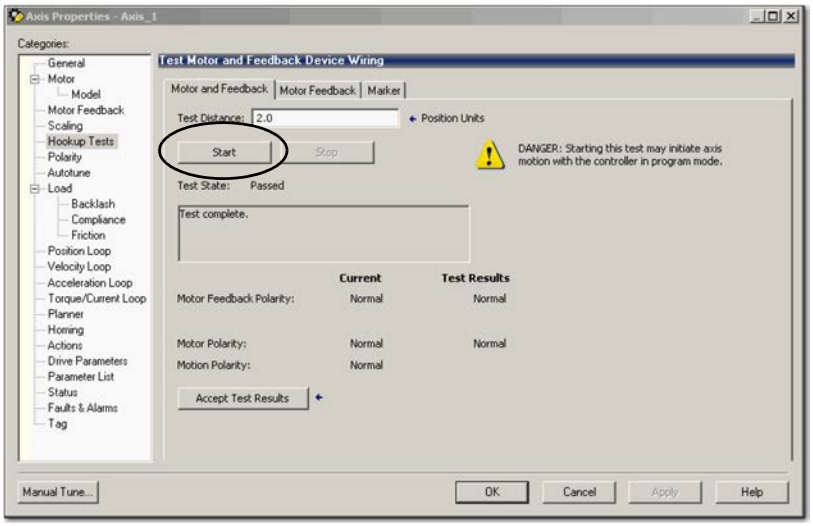
Complete these steps to test the axes.

1. Remove the load from Axis_1.
2. Right-click Axis_1 in your Motion Group folder and choose Properties.



   The Axis Properties dialog box opens.

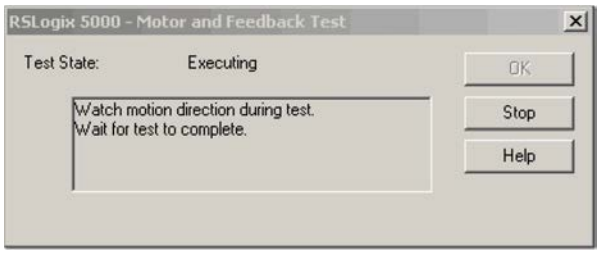
3. Click the Hookup Tests category.
4. Click the Motor and Feedback tab.
5. Type 2.0 as the number of revolutions for the Motor and Feedback test.



   The Motor and Feedback test verifies that the motor power and feedback connections are wired correctly as you command the motor to rotate.

6. Apply 24V DC power to the IOD connector on the 2097-V31PR2-LM drive.
7. Click Start.

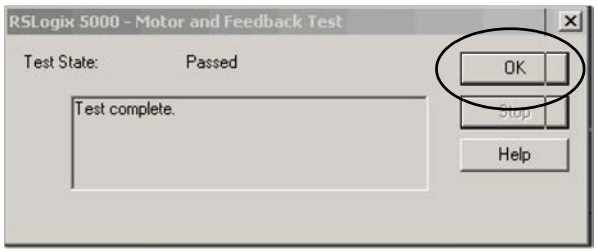
The Logix Designer application - Motor and Feedback Test dialog box opens. The Test State is Executing.



IMPORTANT During this time, the shaft on your motor is turning. Additionally, the axis status indicator is in a steady green state.

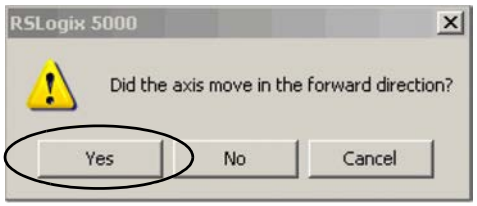
When the test completes successfully, the Test State changes from Executing to Passed.

8. Click OK.



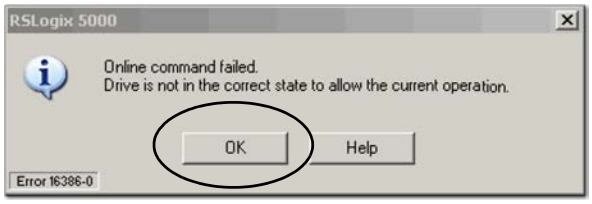
A dialog box opens to confirm that the shaft direction was correct.

9. Click Yes.



10. When prompted, click to accept test results.

If the test fails, this dialog box opens.



1. Click OK.
2. Return to Add the Kinetix 350 Drive to the Logix Designer Application Project on page 33 and verify that you completed each step correctly.

Tune an Axis

For the purposes of this quick start, you do not need to tune the axis. Some applications, however, require the use of tuning to improve the application's use of Integrated Motion on an EtherNet/IP network. Tuning conditions and parameters are defined by each individual application.

For more information about tuning in an application that uses a Kinetix 350 drive, see the Kinetix 350 Single-axis EtherNet/IP Servo Drive User Manual, publication 2097-UM002.

Additional Resources

For a list of additional resources that might assist you when adding the Kinetix 350 drive to an Logix Designer application project, see page 11.

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Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

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

United States or Canada	1.440.646.3434
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