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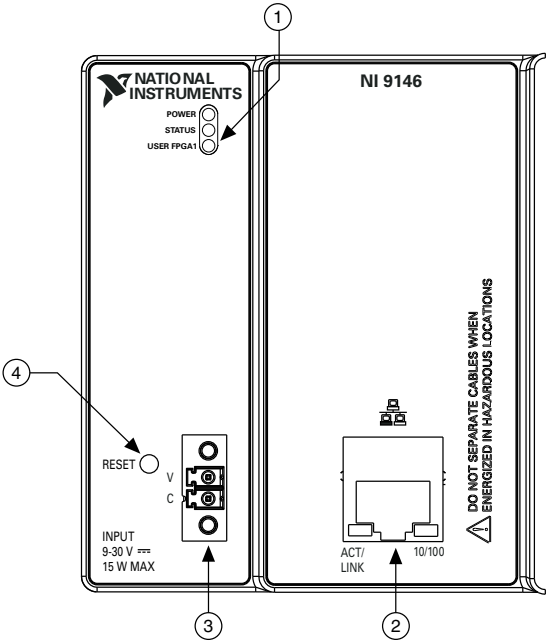
USER MANUAL AND SPECIFICATIONS

NI 9146

Ethernet Expansion Chassis for C Series Modules

This document describes how to connect the NI 9146 to a network and how to use the NI 9146 features. This document also contains specifications for the NI 9146.

Figure 1. NI 9146 Front Panel



1. LEDs
2. RJ-45 Ethernet Port
3. Power Connector
4. Reset Button

Safety Guidelines

Operate the NI 9146 only as described in this document.

Caution Do not operate the NI 9146 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection

built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Safety Guidelines for Hazardous Locations

The NI 9146 is suitable for use in Class I, Division 2, Groups A, B, C, D, T4 hazardous locations; Class I, Zone 2, AEx nA IIC T4 and Ex nA IIC T4 hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI 9146 in a potentially explosive environment. Not following these guidelines may result in serious injury or death.

Caution Do not disconnect the power supply wires and connectors from the controller unless power has been switched off.

Caution Do not disconnect I/O-side wires or connectors unless power has been switched off or the area is known to be nonhazardous.

Caution Do not remove modules unless power has been switched off or the area is known to be nonhazardous.

Caution Substitution of components may impair suitability for Class I, Division 2.

Caution For Division 2 and Zone 2 applications, install the system in an enclosure rated to at least IP54 as defined by IEC/EN 60079-15.

Special Conditions for Hazardous Locations Use in Europe and Internationally

The NI 9146 has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO Certificate No. 07 ATEX 0626664X and is IECEx UL 14.0089X certified. Each device is marked Ⓔx II 3G and is suitable for use in Zone 2 hazardous locations, in ambient temperatures of -40 °C ≤ Ta ≤ 70 °C.

Caution You must make sure that transient disturbances do not exceed 140% of the rated voltage.

Caution The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC 60664-1.

Caution The system shall be mounted in an ATEX/IECEx-certified enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC/EN 60079-15.

Caution The enclosure must have a door or cover accessible only by the use of a tool.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Special Conditions for Marine Applications

Some products are Lloyd's Register (LR) Type Approved for marine (shipboard) applications. To verify Lloyd's Register certification for a product, visit *ni.com/certification* and search for the LR certificate, or look for the Lloyd's Register mark on the product.

Caution In order to meet the EMC requirements for marine applications, install the product in a shielded enclosure with shielded and/or filtered power and input/output ports. In addition, take precautions when designing, selecting, and installing measurement probes and cables to ensure that the desired EMC performance is attained.

Unpacking the Kit

Caution To prevent electrostatic discharge (ESD) from damaging the device, ground yourself using a grounding strap or by holding a grounded object, such as your computer chassis.

1. Touch the antistatic package to a metal part of the computer chassis.
2. Remove the device from the package and inspect the device for loose components or any other sign of damage.

   Caution Never touch the exposed pins of connectors.

   Note Do not install a device if it appears damaged in any way.

3. Unpack any other items and documentation from the kit.

Store the device in the antistatic package when the device is not in use.

What You Need to Install the NI 9146

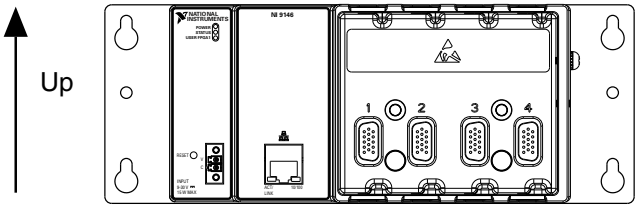
- NI 9146 Ethernet Expansion Chassis
- NI-RIO Software DVD
- C Series I/O modules
- DIN rail mount kit (for DIN rail mounting only)
- Panel mount kit (for panel mounting only)
- Two M4 or number 8 flathead screws (for mounting the chassis without one of the listed mounting kits)
- A number 2 Phillips screwdriver
- Power supply
- Ethernet cable

Note Visit *ni.com/info* and enter the Info Code `rdsoftwareversion` to determine which software you need to use the NI 9146.

Mounting the Chassis

You can mount the chassis horizontally on a flat, vertical, metallic surface such as a panel or wall. The maximum allowable ambient temperature for operation in this configuration is 70 °C. The following figure shows the chassis mounted horizontally.

Figure 2. NI 9146 Mounted Horizontally



You can also mount the chassis on a panel or wall in other orientations, on a non-metallic surface, on a 35 mm DIN rail, on a rack, in an enclosure, or on a desktop. Mounting the chassis in these or other configurations can reduce the maximum allowable ambient temperature and can affect the typical accuracy of modules in the chassis.

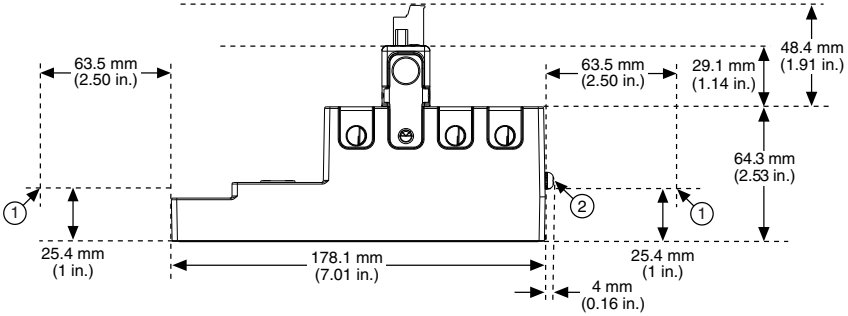
Note For information about how different mounting configurations can cause temperature derating, go to *ni.com/info* and enter the Info Code `criomounting`.

Note For information about typical accuracy specifications for modules, go to *ni.com/info* and enter the Info Code `criotypical`.

Your installation must meet the following requirements for space and cabling clearance:

- Allow 25.4 mm (1 in.) on the top and the bottom of the chassis for air circulation.
- Allow 50.8 mm (2 in.) in front of modules for cabling clearance.

Figure 3. NI 9146 Bottom View with Dimensions



1. Measure ambient temperature here.
2. Chassis Grounding Screw

Figure 4. NI 9146 Front View with Dimensions

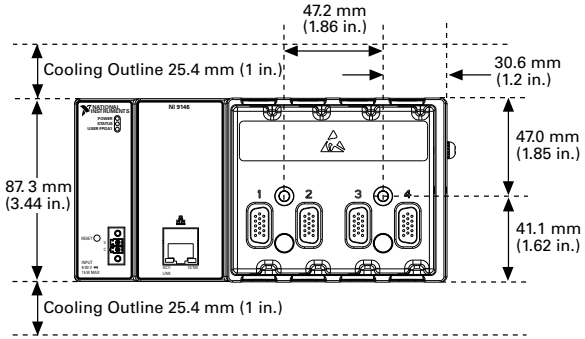
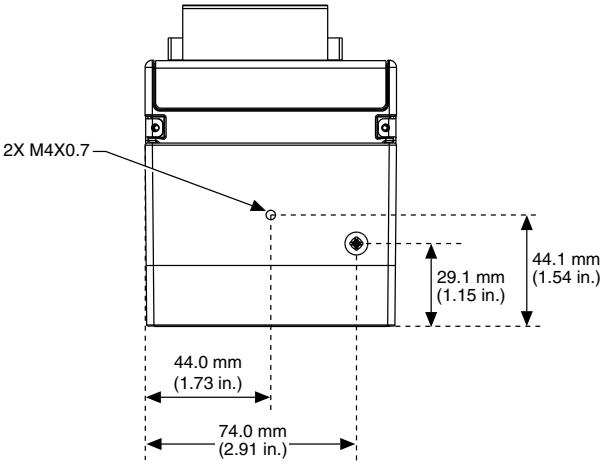


Figure 5. NI 9146 Side View with Dimensions



The following sections give instructions for the mounting methods. Before using any of these mounting methods, record the serial number from the back of the chassis. You will be unable to read the serial number after you have mounted the chassis.

Caution Make sure that no I/O modules are in the chassis before mounting it.

Mounting the Chassis on a Panel

You can use the NI 9904 panel mount kit to mount the NI 9146 on a flat surface. Complete the following steps to mount the NI 9146 on a panel.

1. Fasten the chassis to the panel mount kit using a number 2 Phillips screwdriver and two M4 × 25 screws. National Instruments provides these screws with the panel mount kit. You must use these screws because they are the correct depth and thread for the panel. Tighten the screws to a maximum torque of 1.3 N · m (11.5 lb · in.).

Figure 6. Installing the Panel Mount Accessory on the NI 9146

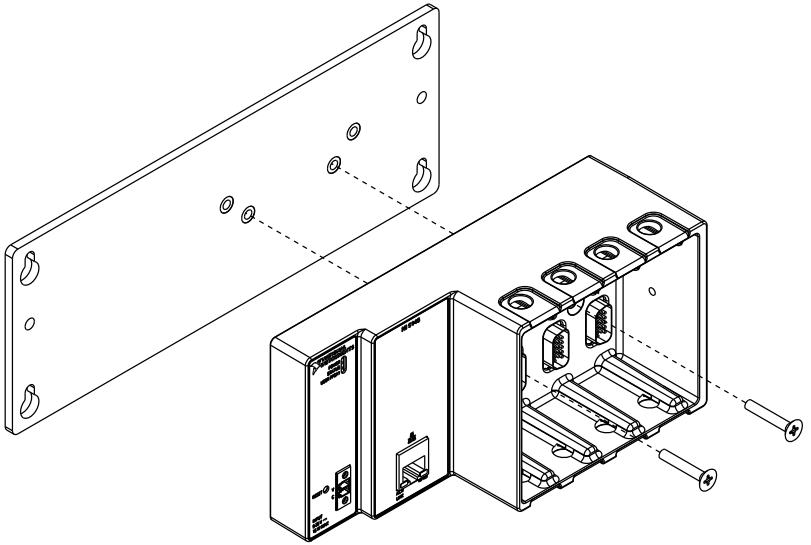
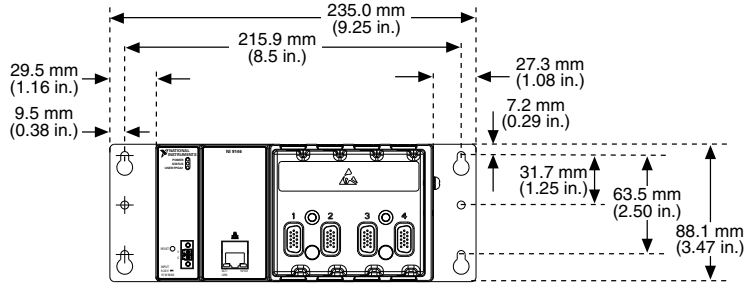


Figure 7. Dimensions of NI 9146 with Panel Mount Accessory Installed



2. Fasten the NI 9904 panel to the wall using the screwdriver and screws that are appropriate for the wall surface. The maximum screw size is M4 or number 8.

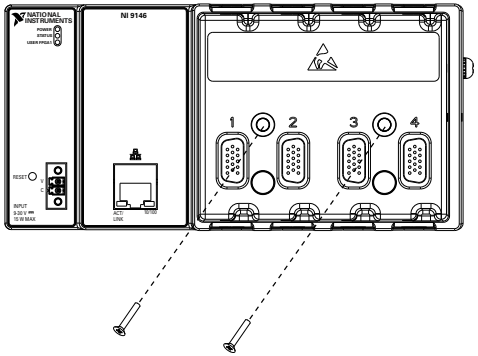
Caution Make sure that no I/O modules are in the chassis before removing it from the panel.

Mounting the Chassis Directly on a Flat Surface Using the Mounting Holes

If you do not have the NI 9904 panel mount kit and do not require the portability of the NI 9904, you can mount the chassis directly on a flat surface using the mounting holes.

1. Align the chassis on the surface.
2. Fasten the chassis to the surface using M4 or number 8 flathead screws, as shown in the following figure. National Instruments does not provide these screws with the chassis.

Figure 8. Mounting the Chassis Directly on a Flat Surface



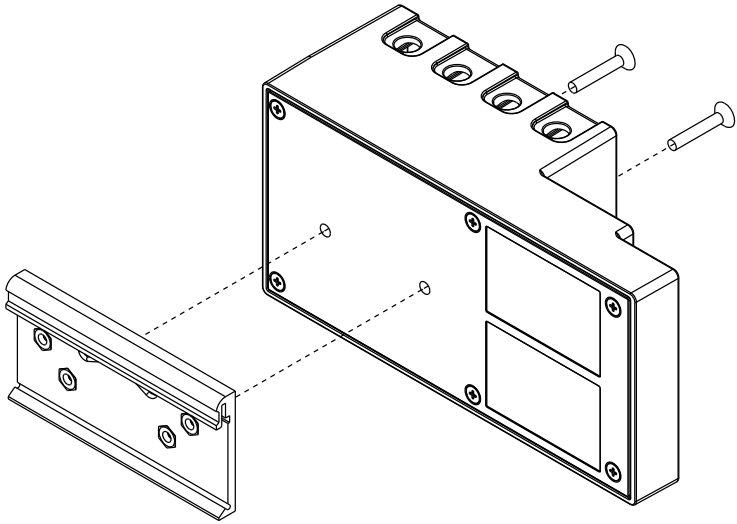
Caution Make sure that no I/O modules are in the chassis before removing it from the surface.

Mounting the Chassis on a DIN Rail

You can order the NI 9912 DIN rail mount kit to mount the NI 9146 on a DIN rail. You need one clip for mounting the chassis on a standard 35 mm DIN rail. Complete the following steps to mount the chassis on a DIN rail.

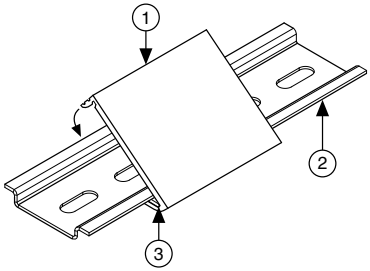
1. Fasten the DIN rail clip to the chassis using a number 2 Phillips screwdriver and two M4 × 16 screws. NI provides these screws with the DIN rail mount kit.

Figure 9. Installing the DIN Rail Clip on the NI 9146



2. Insert one edge of the DIN rail into the deeper opening of the DIN rail clip.

Figure 10. One Edge of the DIN Rail Inserted in a Clip



1. DIN Rail Clip
2. DIN Rail
3. DIN Rail Spring

3. Press down firmly on the chassis to compress the spring until the clip locks in place on the DIN rail.

Caution Make sure that no I/O modules are in the chassis before removing it from the DIN rail.

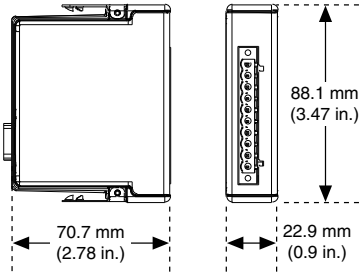
Mounting the Chassis on a Desktop

You can use the NI 9901 desktop mounting kit to mount the chassis on a desktop. You must install the adapter bracket using two M3 × 20 screws. The adapter bracket and the screws are included in the kit. Refer to the NI 9901 documentation for information about mounting the chassis on a desktop.

Installing C Series I/O Modules in the Chassis

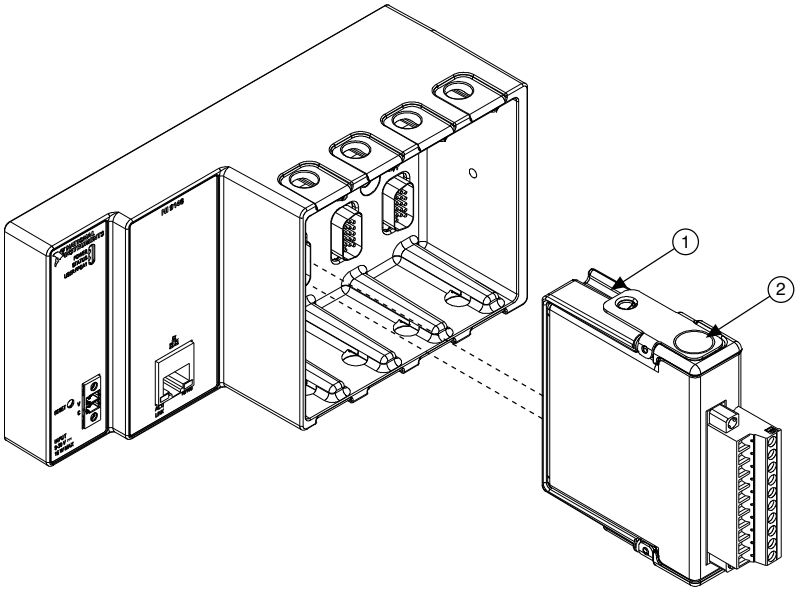
The following figure shows the mechanical dimensions of C Series I/O modules.

Figure 11. C Series I/O Module, Front and Side View with Dimensions



1. Make sure that no I/O-side power is connected to the I/O module. If the system is in a nonhazardous location, the chassis power can be on when you install I/O modules.
2. Align the I/O module with an I/O module slot in the chassis as shown in the following figure. The module slots are labeled 1 to 4, left to right.

Figure 12. Installing an I/O Module in the Chassis



1. Insertion Groove
2. Latch

3. Squeeze the latches and insert the I/O module into the module slot.
4. Press firmly on the connector side of the I/O module until the latches lock the I/O module into place.
5. Repeat these steps to install additional I/O modules.

Removing I/O Modules from the Chassis

Complete the following steps to remove a C Series I/O module from the chassis.

1. Make sure that no I/O-side power is connected to the I/O module.
2. Squeeze the latches on both sides of the module and pull the module out of the chassis.

Connecting the Chassis to Earth Ground

You must connect the chassis grounding screw to earth ground. Refer to the following figure for the location of the grounding screw. Complete the following steps to connect to earth ground.

1. Attach a ring lug to a 1.6 mm^2 (14 AWG) or larger wire.
2. Remove the grounding screw from the grounding terminal on the right side of the chassis.
3. Attach the ring lug to the grounding terminal.
4. Tighten the grounding screw to 0.5 N · m (4.4 lb · in.) of torque.

5. Attach the other end of the wire to earth ground using a method appropriate for the application.

Note If you use shielded cabling to connect to a C Series I/O module with a plastic connector, you must attach the cable shield to the chassis grounding terminal using 1.3 mm^2 (16 AWG) or larger wire. Use shorter wire for better EMC performance.

For more information about earth ground connections, go to *ni.com/info* and enter the Info Code `earthground`.

Connecting the Chassis to a Network

Connect the chassis to an Ethernet network using Ethernet port 1 on the front panel. Use a standard Category 5 (CAT-5) or better shielded, twisted-pair Ethernet cable to connect the chassis to an Ethernet hub or a computer.

Caution To prevent data loss and to maintain the integrity of your Ethernet installation, do not use a cable longer than 100 m.

The first time you power up the chassis, it attempts to initiate a DHCP network connection. If the chassis is unable to initiate a DHCP connection, it connects to the network with a link-local IP address with the form `169.254.x.x`. After powerup, you must install software on the chassis and configure the network settings in Measurement & Automation Explorer (MAX).

Note Installing software may change the network behavior of the chassis. For information about network behavior by installed software version, go to *ni.com/info* and enter the Info Code `ipconfigcrio`.

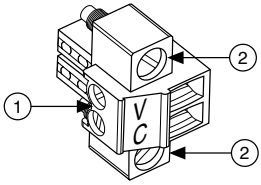
Wiring Power to the Chassis

The NI 9146 requires an external power supply that meets the specifications in the *Power Requirements* section.

The NI 9146 filters and regulates the supplied power and provides power for all of the I/O modules. The NI 9146 has one layer of reverse-voltage protection. Complete the following steps to connect a power supply to the chassis.

1. Ensure that the power supply is turned off.
2. Connect the positive lead of the power supply to the V terminal of the COMBICON power connector shipped with the NI 9146, and tighten the terminal screw. The following figure shows the terminal screws, which secure the wires in the screw terminals, and the connector screws, which secure the power connector on the front panel.

Figure 13. COMBICON Power Connector



1. Terminal Screw
2. Connector Screws

3. Connect the negative lead of the power supply to the C terminal of the power connector and tighten the terminal screw.
4. Install the power connector on the front panel of the NI 9146 and tighten the connector screws.
5. Turn on the power supply.

Powering On the NI 9146

When you apply power to the NI 9146, the chassis runs a power-on self test (POST). During the POST, the Power and Status LEDs turn on. The Status LED turns off, indicating that the POST is complete. If the LEDs do not behave in this way when the system powers on, refer to the *Understanding LED Indications* section.

Restarting the NI 9146 Using the Reset Button

Pressing the Reset button restarts the NI 9146. The FPGA continues to run unless you have selected the **Autoload VI on device reboot** chassis reset option.

To restart the NI 9146 in safe mode, hold the Reset button down for about 5 s, until the Status LED lights yellow, then release the button. The chassis reboots and the Status LED starts blinking three times every few seconds. The chassis is now in Safe Mode. Refer to the MAX help for information about safe mode.

Chassis Startup Options

The following table lists the startup options available for the NI 9146. These options determine how the chassis behaves when it starts up in various conditions. Use the RIO Device Setup utility to select startup options. Access the RIO Device Setup utility by selecting **Start»All Programs»National Instruments»NI-RIO»RIO Device Setup**.

Table 1. NI 9146 Reset Options

Startup Options	Behavior
Do Not Autoload VI	Does not load the FPGA bit stream from flash memory.
Autoload VI on device powerup	Loads the FPGA bit stream from flash memory to the FPGA when the chassis powers on.
Autoload VI on device reboot	Loads the FPGA bit stream from flash to the FPGA when you reboot the chassis either with or without cycling power.

Configuring IP Settings

When you power on the NI 9146 for the first time, it boots into safe mode because there is no software installed on it. This section describes how to configure the IP settings and install software on the chassis.

1. Launch MAX on the host computer and expand **Remote Systems** in the MAX configuration tree. MAX lists the NI 9146 as the model name of the chassis followed by the serial number, for example, **NI9146-XXXXXXXX**.

   The chassis automatically attempts to connect to the network using DHCP. If DHCP is not available, the chassis connects to the network with a link-local IP address with the form `169.254.x.x`. You must connect the chassis directly to the host computer to configure it in this state.
2. Select the chassis under **Remote Systems** to see the **Network Settings** tab in the middle pane of MAX.
3. Enter a name for the chassis in the **Name** field.
4. Select settings for the chassis in the **IP Settings** section, then click **Apply**.

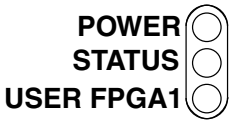
   Note For information about configuring network settings, refer to the Configuring Network Settings book of the *MAX Remote Systems Help*. In MAX, click **Help»Help Topics»Remote Systems**. On the **Contents** tab, browse to **LabVIEW Real-Time Target Configuration»Configuring Network Settings**.
5. When you click **Apply**, you are prompted to reboot the chassis for the changes to take effect. Click **Yes**. You can also reboot the chassis by right-clicking the name under **Remote Systems** and selecting **Reboot**.
6. After rebooting, the chassis appears under **Remote Systems** with the assigned name. Expand the chassis and select **Software**.
7. Click **Add/Remove Software** in the toolbar to launch the LabVIEW Real-Time Software Wizard.
8. Install the Recommended Software Set that appears in the LabVIEW Real-Time Software Wizard.

For more information about configuring the chassis in MAX, refer to the *MAX Help*. For information about installing and using LabVIEW FPGA, refer to the *LabVIEW FPGA Module Release and Upgrade Notes*.

Understanding LED Indications

The following figure shows the NI 9146 chassis LEDs.

Figure 14. NI 9146 LEDs



POWER LED Indicators

The following table lists the POWER LED indicators.

Table 2. POWER LED Indicators

LED Color	LED Pattern	Indication
Green	Solid	The NI 9146 is powered on and the connected power supply is adequate.
—	Off	The NI 9146 is powered off.

STATUS LED

The STATUS LED is off during normal operation. The NI 9146 indicates specific error conditions by flashing the STATUS LED a certain number of times every few seconds, as shown in the following table.

Table 3. STATUS LED Indicators

Number of Flashes	Indication
2	The chassis has detected an error in its software. This usually occurs when an attempt to upgrade the software is interrupted. Reinstall software on the chassis. Refer to the *Measurement & Automation Explorer Help* for information about installing software on the chassis.
3	The chassis is in safe mode. Refer to the *Measurement & Automation Explorer Help* for information about safe mode.

Table 3. STATUS LED Indicators (Continued)

Number of Flashes	Indication
4	The software has crashed twice without rebooting or cycling power between crashes. This usually occurs when the chassis runs out of memory. Review your RT VI and check the memory usage. Modify the VI as necessary to solve the memory usage issue.
Continuous flashing or solid	The chassis has detected an unrecoverable error. Contact National Instruments.

User LED

You can define the USER FPGA1 LED to meet the needs of your application. The following table lists the USER FPGA1 LED indicators.

Table 4. User LEDs

LED	LED Color	Description
USER FPGA1	Green/Yellow	Use the LabVIEW FPGA Module and NI-RIO Device Drivers software to define the USER FPGA1 LED. Use the USER FPGA1 LED to help debug your application or retrieve application status. Refer to the *LabVIEW Help* for information about programming this LED.

Troubleshooting Network Communication

If the NI 9146 cannot communicate with the network, you can perform the following troubleshooting steps.

1. Hold the Reset button down for about 5 s, until the Status LED lights yellow, then release the button. The chassis reboots and the Status LED starts blinking three times every few seconds. The chassis is now in Safe Mode.
2. Repeat step 1. The Status LED repeats the same behavior. The chassis is now in Safe Mode with IP Reset.
3. Configure the IP and other network settings in MAX.
4. Press and release the Reset button to reboot the chassis.

NI 9146 Specifications

This document lists the specifications for the NI 9146 Ethernet Expansion Chassis. The following specifications are typical for the -40 °C to 70 °C operating temperature range unless otherwise noted.

Caution Do not operate the NI 9146 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Network

Network interface	10BaseT and 100BaseTX Ethernet
Compatibility	IEEE 802.3
Communication rates	10 Mbps, 100 Mbps, auto-negotiated
Maximum cabling distance	100 m/segment

Reconfigurable FPGA

Type	Xilinx Spartan-6 LX 45
Number of flip-flops	54,576
Number of 6-input LUTs	27,288
Number of DSP 48s	58
Available block RAM	2,088 kbits
Number of DMA channels	5

Power Requirements

Recommended power supply	24 W, 24 VDC
Power consumption	15 W maximum
Power supply input range	9 V to 30 V

Note The power consumption specifications in this document are maximum values for a LabVIEW FPGA application compiled at 40 MHz. Your application power requirements may be different. To calculate the power requirements of the NI 9146, add the power consumption/dissipation for the chassis and the I/O modules you are using. Keep in mind that the resulting total power consumption is a maximum value and that the NI 9146 may require less power in your application. For more information about the I/O module power requirements, refer to the module operating instructions.

Physical Characteristics

If you need to clean the NI 9146, wipe it with a dry towel.

Tip For two-dimensional drawings and three-dimensional models of the NI 9146, visit *ni.com/dimensions* and search by module number.

Weight (unloaded)	643 g (22.7 oz)

Screw-terminal wiring	
Gauge	0.2 mm ^{2} to 2.1 mm^2 (24 AWG to 14 AWG) copper conductor wire
Wire strip length	6 mm (0.24 in.) of insulation stripped from the end
Temperature rating	85 °C
Torque for screw terminals	0.20 N · m to 0.25 N · m (1.8 lb · in. to 2.2 lb · in.)
Wires per screw terminal	One wire per screw terminal
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.3 N · m to 0.4 N · m (2.7 lb · in. to 3.5 lb · in.)

Safety Voltages

Connect only voltages that are within the following limits:

V terminal to C terminal	30 V maximum, Measurement Category I

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

Caution Do not connect the NI 9146 to signals or use for measurements within Measurement Categories II, III, or IV.

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Safety and Hazardous Locations Standards

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1
- EN 60079-0:2012, EN 60079-15:2010
- IEC 60079-0: Ed 6, IEC 60079-15; Ed 4

- UL 60079-0; Ed 5, UL 60079-15; Ed 3
- CSA 60079-0:2011, CSA 60079-15:2012

Note For UL and other safety certifications, refer to the product label or the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for sensitive electrical equipment for measurement, control, and laboratory use:

- EN 61326-2-1 (IEC 61326-2-1): Class A emissions; Industrial immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 94/9/EC; Potentially Explosive Atmospheres (ATEX)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit *ni.com/certification*, search by model number or product line, and click the appropriate link in the Certification column.

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4
Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, Ex nA IIC T4
Europe (ATEX) and International (IECEx)	Ex nA IIC T4 Gc

Environmental

Temperature (IEC 60068-2-1 and IEC 60068-2-2)	
Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C

Caution Failure to follow the mounting instructions in the user manual can cause temperature derating. Visit *ni.com/info* and enter Info Code `criomounting` for more information about mounting configurations and temperature derating.

Ingress protection	IP40
Operating humidity (IEC 60068-2-56)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-56)	5% RH to 95% RH, noncondensing
Pollution Degree (IEC 60664)	2
Maximum altitude	2,000 m

Indoor use only.[1]

Shock and Vibration

To meet these specifications, you must panel mount the chassis and affix ferrules to the ends of the terminal wires.

Operating shock (IEC 60068-2-27)	30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations
Operating vibration	
Random (IEC 60068-2-64)	5 g_{rms}, 10 Hz to 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 Hz to 500 Hz

Cabling

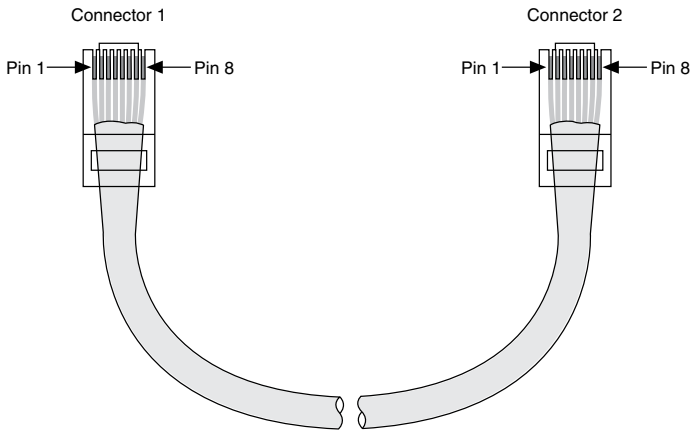
The following table shows the standard Ethernet cable wiring connections for both normal and crossover cables.

[1] Use NI 9917 and NI 9918 industrial enclosures to protect the device in harsh, dirty, or wet environments.

Table 5. Ethernet Cable Wiring Connections

Pin	Connector 1	Connector 2 (Normal)	Connector 2 (Crossover)
1	white/orange	white/orange	white/green
2	orange	orange	green
3	white/green	white/green	white/orange
4	blue	blue	blue
5	white/blue	white/blue	white/blue
6	green	green	orange
7	white/brown	white/brown	white/brown
8	brown	brown	brown

Figure 15. Ethernet Connector Pinout



Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

Battery Replacement and Disposal



Battery Directive This device contains a long-life coin cell battery. If you need to replace it, use the Return Material Authorization (RMA) process or contact an authorized National Instruments service representative. For more information about compliance with the EU Battery Directive 2006/66/EC about Batteries and Accumulators and Waste Batteries and Accumulators, visit *ni.com/environment/batterydirective*.

电子信息产品污染控制管理办法（中国 RoHS）



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