

GETTING STARTED GUIDE

NI-DAQ™ mx for NI WLS/ENET-9163

NI WLS/ENET-9000 Series Devices

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This guide describes how to install and configure the NI-DAQmx software and NI WLS/ENET-9000 Series data acquisition (DAQ) device (comprised of an NI WLS/ENET-9163 carrier and NI C Series I/O module). This guide also describes how to verify that the device is working properly.

Refer to the *NI WLS/ENET-9163 User Guide and Specifications* and your C Series I/O module user guide for information about how to use your NI WLS/ENET-9000 Series device.

You must be an Administrator to install NI software and devices on your computer. Check for documentation updates at ni.com/manuals.

Pinouts and User Guides

All NI-DAQmx devices have a PDF user guide that contains pinouts. Go to ni.com/manuals and search for your NI C Series I/O module.



Step 1. Install the Application Software and NI-DAQmx

Before installing your DAQ device, you must install the software you plan to use with the device. Complete the following steps.

1. Install the NI application software, LabVIEW, LabWindows™/CVI™, Measurement Studio, or LabVIEW SignalExpress, as described in the installation instructions that accompany your software.



Note Back up any applications before upgrading software or modifying the application.

2. Install the NI-DAQmx driver software *before* installing new devices so Windows can detect them. Insert the disk, and complete the instructions, including rebooting the computer. For troubleshooting instructions, use the Hardware Installation/Configuration Troubleshooter at ni.com/support/install.

Step 2. Unpack and Set Up the Device

The NI C Series I/O module and the NI WLS/ENET-9163 carrier are packaged separately. Remove the packaging and inspect the devices. Contact NI if the components appear damaged. Do *not* install a damaged device.



Caution The devices are static sensitive. *Always* properly ground yourself and the equipment when handling or connecting to the devices.

Complete the following steps while referring to Figure 1 to install the C Series I/O module into the NI WLS/ENET-9163 carrier.



Note Before installing the device, you *must* install the software, as described in *Step 1. Install the Application Software and NI-DAQmx*.



Note Refer to the *NI WLS/ENET-9163 User Guide and Specifications* for information about mounting and grounding the NI WLS/ENET-9163 carrier.

1. Make sure no cables/signals are connected to the C Series I/O module or the NI WLS/ENET-9163 carrier. Remove any protective covers from the C Series I/O module connector.
2. Align the C Series I/O module with the NI WLS/ENET-9163 carrier.
3. Squeeze the latches and insert the C Series I/O module into the NI WLS/ENET-9163 carrier.

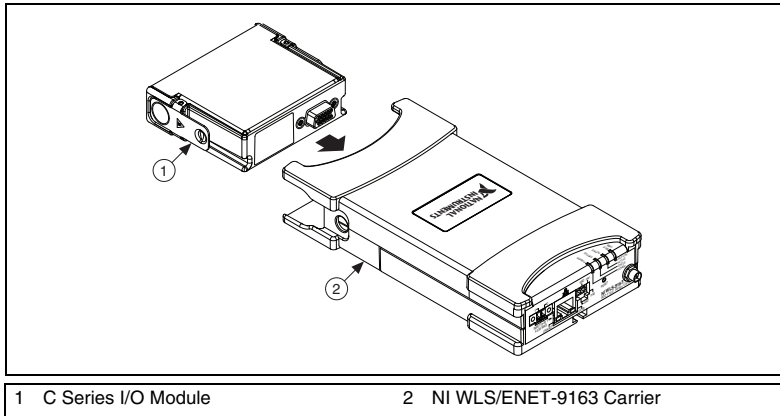


Figure 1. C Series I/O Module Installation

- Press firmly on the connector side of the C Series I/O module until the latches lock the module into the NI WLS/ENET-9163 carrier, as shown in Figure 2.

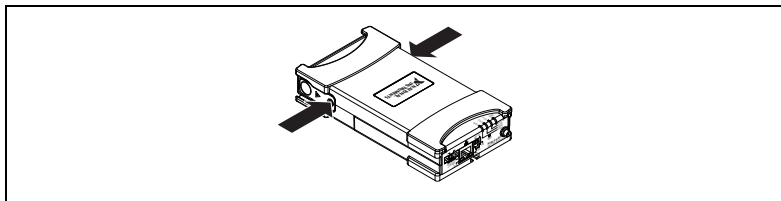


Figure 2. Locking Module into Place

- (NI WLS-9163 Carrier Only)** Attach the supplied antenna as shown in Figure 3.

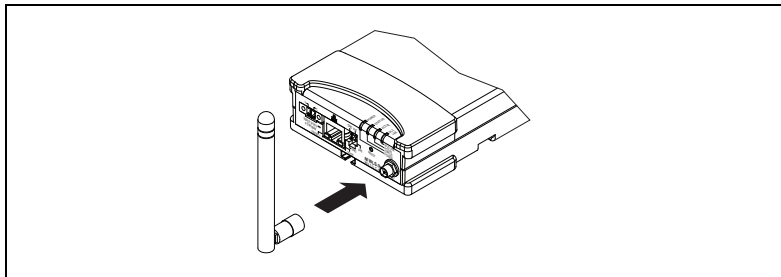


Figure 3. NI WLS-9163 Carrier Antenna Assembly

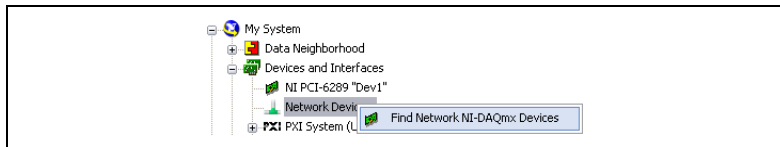
- Use a standard Category 5 Ethernet cable to connect the NI WLS/ENET-9000 Series device to an Ethernet network.¹ Connect one end to the RJ-45 Ethernet port on the device, and the other end to an Ethernet hub or directly to your computer. Refer to the *NI WLS/ENET-9163 User Guide and Specifications* for information about the Ethernet cable.
- Power the device using the included power adapter or other 9–30 VDC power source.

The POWER and STATUS LEDs light. The POWER LED will light as long as power is being supplied to the NI WLS/ENET-9000 Series device. Refer to the *NI WLS/ENET-9163 User Guide and Specifications* for information about the LEDs on the NI WLS/ENET-9163 chassis.

Step 3. Discover the Device

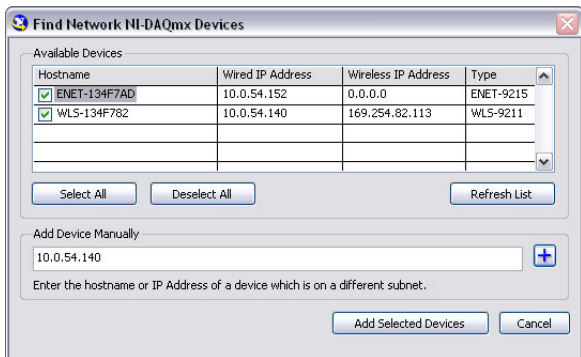
To discover the device, complete the following steps.

- Launch Measurement & Automation Explorer (MAX).
- Expand **Devices and Interfaces**, right-click **Network Devices**, and select **Find Network NI-DAQmx Devices**.



¹ You can either use a standard Category 5 Ethernet cable or an Ethernet crossover cable to connect the NI WLS/ENET-9000 Series device directly to your computer.

If you plugged your device into an Ethernet port on your local subnet or directly into your computer, the device should appear in the list of available devices.



- Put a checkmark next to your device in the Available Devices window and click **Add Selected Devices** to add the device to MAX. The device will be listed under Network Devices in the configuration tree.

If your device does not appear in Available Devices, wait until the POWER LED on the device is green and the STATUS LED turns off, then click **Refresh List**. If the device does not appear, try the following:

- If you connected your device directly to your computer, ensure your network card is configured to obtain an IP address automatically, then click **Refresh List**.



- If you plugged your device into an Ethernet port that is not on your subnet, try using its hostname. If your DHCP server is set up to automatically register hostnames, the device registers the hostname as WLS-<serial number> or ENET-<serial number>. Enter the hostname into the **Add Device Manually** field, and click the + button.
- If you know the device IP address, such as 192.168.0.2, enter it into the **Add Device Manually** field, and click the + button.

For additional troubleshooting resources for the NI WLS/ENET-9163, refer to the KnowledgeBase document, *Troubleshooting Resources for the NI WLS/ENET-9163*, by going to ni.com/info and entering the info code 9163.

If your device still does not appear, contact your system administrator to confirm that the network is working and that a firewall is not interfering with discovery. For more information about the ports used for discovery and communication, refer to the *NI WLS/ENET-9163 User Guide and Specifications*.

Troubleshooting Device Connectivity

If your device becomes disconnected from the network, try the following:

- After moving the device to a new network, NI-DAQmx may lose connection to the device. In this case, click **Reconnect** to provide NI-DAQmx with the new hostname or IP address. For more information about connecting to network devices, refer to the *NI WLS/ENET-9163 User Guide and Specifications*.
- The NI WLS/ENET-9000 Series device icon indicates whether it is recognized and present on the network. If a connected device appears as disconnected in the configuration tree in MAX, , press <F5> to reconnect. If successful, the device icon changes, .

For additional troubleshooting resources for the NI WLS/ENET-9163, refer to the KnowledgeBase document, *Troubleshooting Resources for the NI WLS/ENET-9163*, by going to ni.com/info and entering the info code 9163.

Step 4. Configure the Device

Select your device under Network Devices to open the Network Config tab. The Network Config tab contains the following fields:

- **Device Information**—NI-DAQmx populates these fields when the device is added to your system.
- **General Network Settings**—Enter the following information in the General Network Settings section:
 - **Hostname**—The default is WLS-<serial number> or ENET-<serial number>. This field is limited to 32 characters.
 - **Comment**—Use this field to enter notes, such as the device location.
- **(NI WLS-9000 Series Only) Wireless Configuration**—To configure your NI WLS-9000 Series device for connection to the wireless network, select the Wireless Configuration tab and complete the following steps.
 - a. Select the country in which the device is operating from the Country pull-down menu.
 - b. (Optional) Click the **Radio On** checkbox to enable the radio. Selecting Radio On populates the Wireless Configuration tab with additional fields.
 - Select **DHCP + Link-Local**, **DHCP, Static**, or **Link-Local** from the Obtain IP Address Through pull-down menu.

Wired Configuration | **Wireless Configuration**

Obtain IP Address Through:

IP Address:

Subnet Mask:

Gateway:

DNS Server:

Country:

Radio On:

SSID: 🔍

Wireless Mode:

Authentication Type:

EAP Type:

Username:

Password:

If you selected DHCP from the Obtain IP Address Through pull-down menu, the IP Address, Subnet Mask, Gateway, DNS Server fields are automatically populated after you save your settings. Otherwise, ask your network administrator for the correct settings.

- Select or enter the name of the wireless network to which you want to connect in the SSID (Service Set Identifier) field.
- Select **Infrastructure** or **Ad Hoc** from the Wireless Mode pull-down menu.

- Select the type of authentication (**Open, WEP, WPA Pre-Shared Key, WPA2 Pre-Shared Key, WPA Enterprise, WPA2 Enterprise**) used on the wireless network from the Authentication Type pull-down menu. Contact your network administrator for the appropriate settings. For more information about the resulting fields, refer to the *NI-DAQmx Help*, accessible from **Start»All Programs»National Instruments»NI-DAQ**.
- Select **LEAP, PEAP, TTLS, or TLS** from the EAP Type pull-down menu.

If you selected LEAP or PEAP from the EAP Type pull-down menu, the you must enter the correct login and password in the Username and Password fields. Ask your network administrator for the correct settings.

- c. Click **Save Settings**. The Apply Changes? alert opens. Click **OK**.
The WLS LINK LED lights on the device indicating a connected and authenticated network link.
- d. If Link Status (Wireless) in the Device Information section of the Network Config tab is listed as **Down**, click the **Refresh** button a few times. Link Status (Wireless) must be listed as **Up** before you can disconnect the Ethernet cable.

When the device is properly configured, you can connect the device to the wireless network that you configured it for by disconnecting the Ethernet cable from the device and clicking the **Refresh** button so that the Link Status (Wired) changes to **Down**. For more information about MAX configuration, refer to the *NI-DAQmx Help*, accessible from **Start»All Programs»National Instruments»NI-DAQ**.



Note If after clicking **Save Settings** your device becomes unresponsive, press the RESET button on the NI WLS/ENET-9000 Series device for five seconds to return the device user configuration to the factory defaults and reconnect the Ethernet cable. Refer to the [Troubleshooting Device Connectivity](#) section for more network connection tips.

- **Wired Configuration**—To use your NI WLS/ENET-9000 Series device with an Ethernet cable, select the Wired Configuration tab (for NI WLS-9000 Series devices) or the Configuration tab (for NI ENET-9000 Series devices) and complete the following steps.
 - a. Select **DHCP + Link-Local**, **DHCP**, **Static**, or **Link-Local** from the Obtain IP Address Through pull-down menu.

Wired Configuration | Wireless Configuration

Obtain IP Address Through: DHCP + Link-Local

IP Address: 10.0.54.137

Subnet Mask: 255.255.255.128

Gateway: 10.0.54.129

DNS Server: 130.164.44.25

If you selected DHCP from the Obtain IP Address Through pull-down menu, the IP Address, Subnet Mask, Gateway, DNS Server fields are automatically populated after you save your settings. Otherwise, ask your network administrator for the correct settings.

- b. Click **Save Settings**. The Apply Changes? alert opens. Click **OK**.

For more information about MAX configuration, refer to the *NI-DAQmx Help*, accessible from **Start»All Programs»National Instruments»NI-DAQ**.

Step 5. Self-Test Your Device

In MAX, right-click your NI WLS/ENET-9000 Series device and select **Self-Test**. Self-test performs a brief test to determine successful device installation. When the self-test finishes, a message indicates successful verification or if an error occurred. If an error occurs, refer to ni.com/support/install.

Step 6. Attach Sensors and Signal Lines

Attach sensors and signal lines to the terminal block or accessory terminals to your device. The following table lists the different ways to access device pin assignments (pinouts).

Location	How to Access Pinout
MAX	Right-click the device name under Network Devices and select Device Pinouts .
	Right-click the device name under Network Devices and select Help»Online Device Documentation . A browser window opens to ni.com/manuals with the results of a search for relevant device documents.
DAQ Assistant*	Select the task or virtual channel, and click the Connection Diagram tab. Select each virtual channel in the task.
NI-DAQmx	Refer to the <i>NI-DAQmx Help</i> that installs with NI-DAQmx.

Location	How to Access Pinout
ni.com/manuals	Refer to the device documentation (user guide) for your C Series I/O module.
* From the Connection Diagram tab in the DAQ Assistant, you can view and print a connection diagram for tasks and virtual channels in your system. Refer to the <i>DAQ Getting Started</i> guides for more information about using the DAQ Assistant.	

For information about sensors, go to ni.com/sensors, or refer to the *Common Sensors* topic in the *NI-DAQmx Help*. For information about IEEE 1451.4 TEDS smart sensors, go to ni.com/teds. If you are using LabVIEW SignalExpress, refer to [Step 8. Use NI-DAQmx with Your Application Software](#).

Step 7. Run Test Panels

Complete the following steps to use the MAX test panel.

1. In MAX, expand **Devices and Interfaces»Network Devices**.
2. Right-click your device, and select **Test Panels** to open a test panel for the selected device.
3. Click the tabs at the top and **Start** to test the device functions, or **Help** for operating instructions.
If the test panel displays an error message, refer to ni.com/support.
4. Click **Close** to exit the test panel.

Step 8. Use NI-DAQmx with Your Application Software

The DAQ Assistant is compatible with version 8.2 or later of LabVIEW, version 7.x or later of LabWindows/CVI or Measurement Studio, or with version 3 or later of LabVIEW SignalExpress.

LabVIEW SignalExpress LE, an easy-to-use configuration-based tool specifically designed for data logging applications, is at **Start»All Programs»National Instruments»LabVIEW SignalExpress**. To get started with data acquisition in your application software, refer to the tutorials listed in the following table.

Application	Tutorial Location
LabVIEW	Go to Help»Search the LabVIEW Help . Next, go to Getting Started with LabVIEW»Getting Started with DAQ»Taking an NI-DAQmx Measurement in LabVIEW .
LabWindows/CVI	Go to Help»Contents . Next, go to Using LabWindows/CVI»Data Acquisition»Taking an NI-DAQmx Measurement in LabWindows/CVI .
Measurement Studio	Go to NI Measurement Studio Help»Getting Started with the Measurement Studio Class Libraries»Measurement Studio Walkthroughs»Walkthrough: Creating a Measurement Studio NI-DAQmx Application .
LabVIEW SignalExpress	Go to Help»Taking an NI-DAQmx Measurement in SignalExpress .

Refer to the *NI WLS/ENET-9163 User Guide and Specifications* and your C Series I/O module user guide for information about how to use your NI WLS/ENET-9000 Series device.

Programming Examples

NI-DAQmx includes example programs to help you get started developing an application. Modify example code and save it in an application, or use examples to develop a new application or add example code to an existing application.

To locate LabVIEW, LabWindows/CVI, Measurement Studio, Visual Basic, and ANSI C examples, go to ni.com/info and enter the info code `daqmxexp`. For additional examples, refer to zone.ni.com.

To run examples without hardware installed, use an NI-DAQmx simulated device. In MAX, select **Help»Help Topics»NI-DAQmx»MAX Help for NI-DAQmx** for information about creating NI-DAQmx simulated devices.

Troubleshooting

If you have problems installing your software, go to ni.com/support/daqmx. For hardware troubleshooting, go to ni.com/support and enter your device name, or go to ni.com/kb.

If you think you have damaged your device and need to return your National Instruments hardware for repair or device calibration, refer to ni.com/info and enter the info code `rdsean` to learn how to begin the Return Merchandise Authorization (RMA) process.

Worldwide Technical Support

For support information, refer to the *Technical Support Information* document available at ni.com/manuals. Also visit ni.com/support or ni.com/zone. For support available at the National Instruments worldwide offices, visit ni.com. National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504.

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