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GETTING STARTED GUIDE

NI 9795 WSN C Series Gateway

This guide describes how to install, configure, and verify the National Instruments 9795 Wireless Sensor Network (WSN) C Series gateway, NI WSN nodes, and NI software.

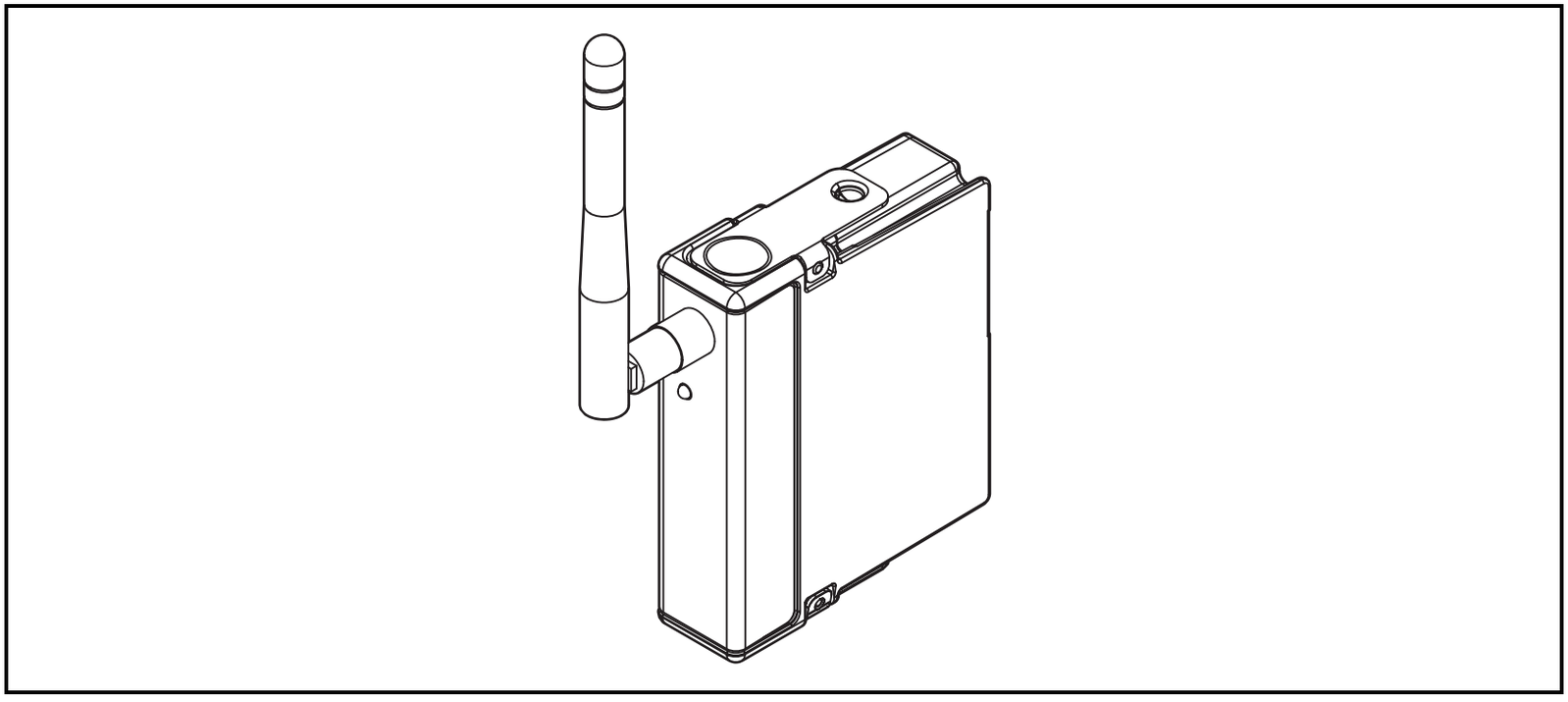
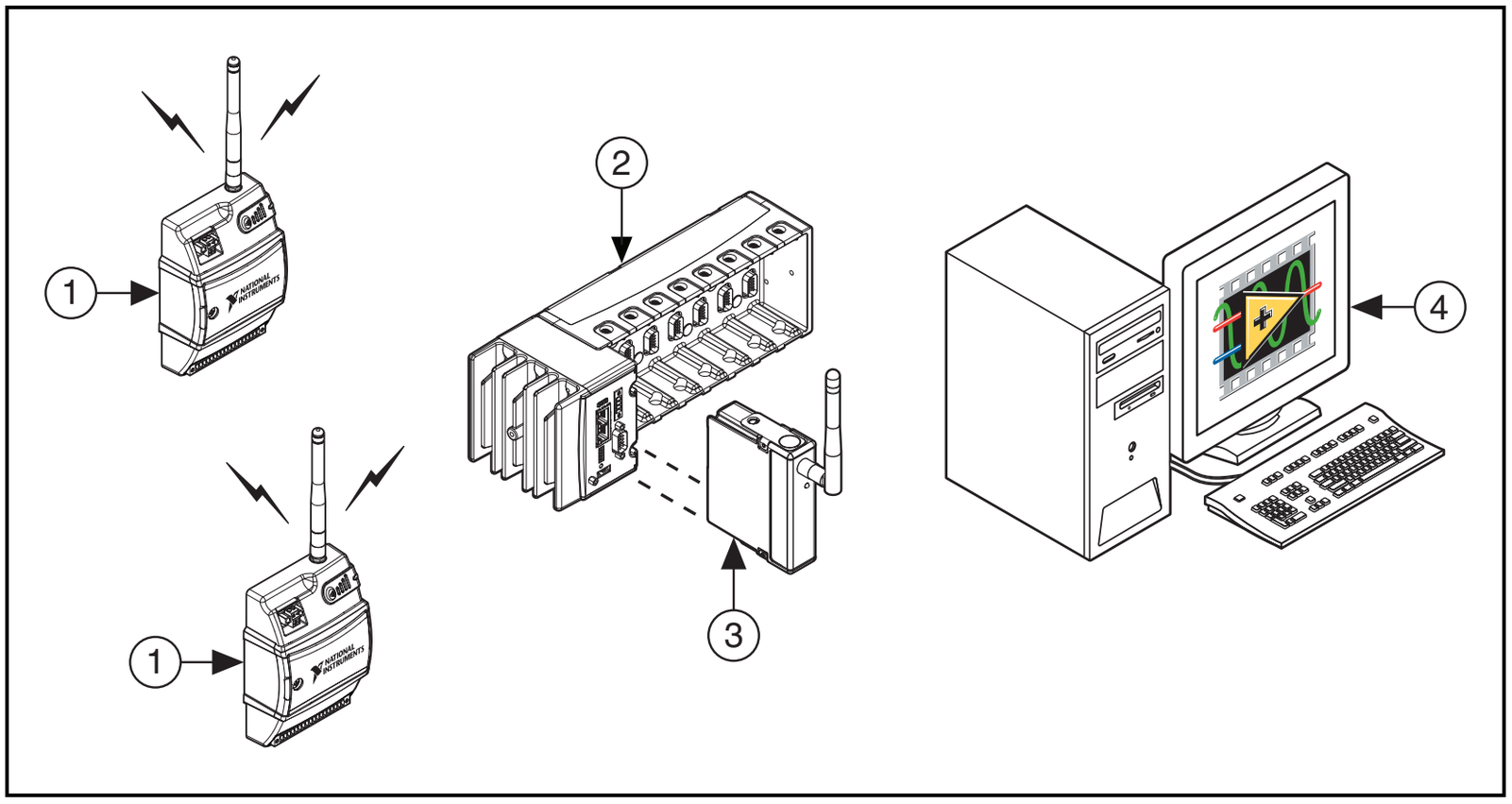


Figure 1. NI 9795 WSN C Series Gateway

NATIONAL INSTRUMENTS™



1	NI WSN-32*xx* Nodes Running Application Software	3	NI 9795 WSN C Series Gateway
2	NI CompactRIO Controller and Chassis	4	PC or NI Real-Time Hardware
		5	Ethernet Network (not pictured)

Figure 2. NI WSN System Components

The NI WSN system contains five main components: a PC running Windows and NI software, a NI WSN gateway, NI WSN-32*xx* node(s), a NI CompactRIO chassis, as shown in Figure 2, and an Ethernet network.

What You Need To Get Started

For information about which software version supports your device, go to `ni.com/info` and enter `wsnsoftware`.

- Host PC running Windows and NI software
- NI LabVIEW
- NI LabVIEW Real-Time Module
- NI LabVIEW Wireless Sensor Network Module (Optional. Includes NI-WSN driver software)
- NI-RIO driver software
- NI-WSN driver software which contains NI Measurement & Automation Explorer (MAX)
- NI CompactRIO controller and chassis or an integrated NI CompactRIO controller and chassis
- NI 9795 WSN C Series gateway



Note The NI 9795 WSN C Series gateway can only be used in a NI CompactRIO chassis that supports the RIO Scan Interface (RSI). For more information, go to `ni.com/info` and enter `rdsoftwareversion`.

- NI WSN-32*xx* node devices with an approved power supply or four approved 1.5 V AA batteries for each node
- RJ45 Ethernet cable/Ethernet network
- Related hardware and software documentation

Related Documentation

For a complete list of documentation related to NI WSN, refer to `ni.com/info` and enter `rdwsnrd`. In addition to this guide, the following documents may be useful when configuring your NI WSN system.

- Documentation for your NI CompactRIO controller located at **Start»All Programs»National Instruments»NI-RIO» CompactRIO**
- *NI 9795 WSN C Series Gateway User Guide and Specifications*
- *NI WSN-32xx User Guide and Specifications*
- *MAX Help for WSN Devices*, available in MAX from **Start» All Programs»National Instruments»NI-WSN» Configuring WSN in MAX**

- Refer to the *NI-WSN* book on the Contents tab of the *LabVIEW Help*, which is available by selecting **Help»LabVIEW Help** in LabVIEW
- *NI-WSN Readme*, available on the installation disc included with your device



Caution Before installing your device, read all the product documentation to ensure compliance with safety, EMC, and environmental regulations.

Step 1. Unpack and Install the Device

Remove the device from the packaging and inspect it. Contact NI if the device appears damaged. Do *not* install a damaged device. Before setting up NI WSN nodes, remove and save the serial number sticker located on the back of NI WSN node for future use when configuring your device in software.



Caution The device is static sensitive. Always properly ground yourself and the equipment when handling or connecting to the device.

Inserting the NI 9795 in the NI CompactRIO Chassis

1. Attach the antenna to the NI 9795.
2. Align the gateway with any I/O slot and insert it in the NI CompactRIO chassis.

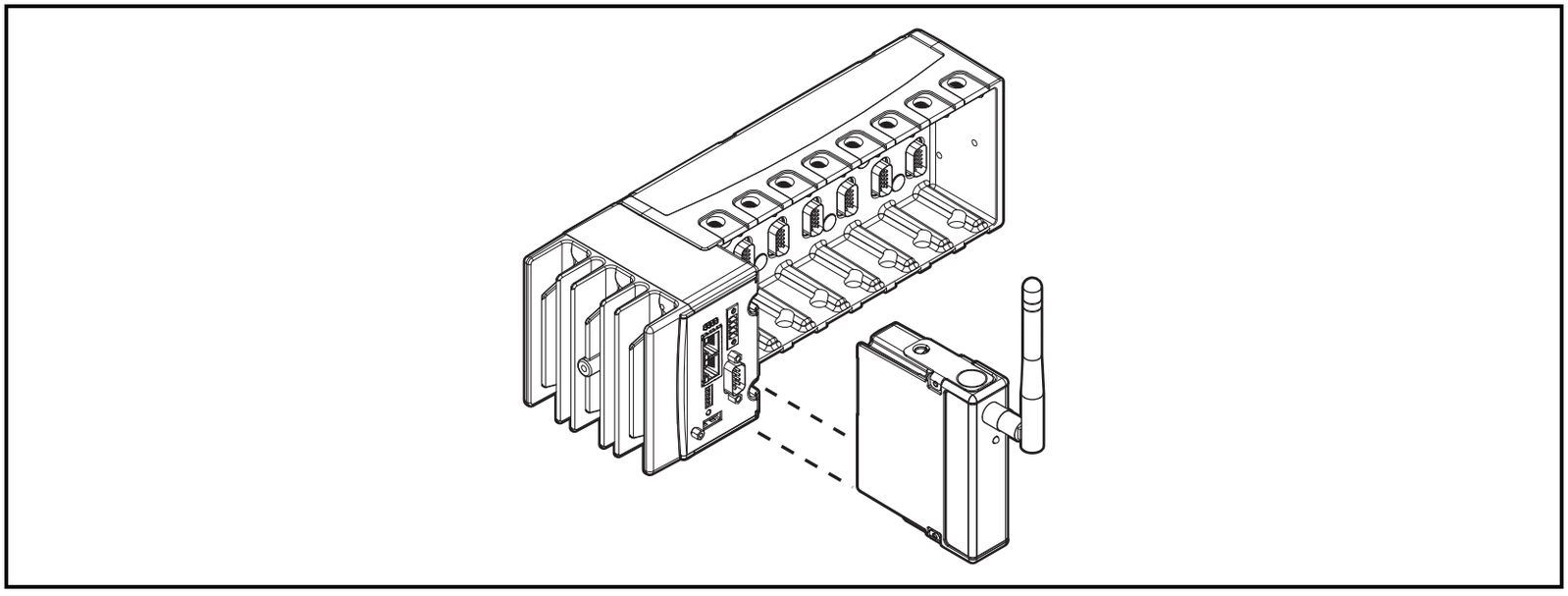


Figure 3. Inserting the NI 9795 into the C Series Chassis

Step 2. Install NI-WSN Software on the Host PC

For information about which software version supports your device, go to `ni.com/info` and enter `wsnsoftware`. You must be an Administrator to install NI software and devices on your computer. To install the NI-WSN software, complete the following steps:

1. Close all other applications.
2. Install NI LabVIEW.
3. Install NI LabVIEW Real-Time Module.
4. Install the NI-RIO driver software.
5. Install the NI LabVIEW WSN Module (optional).
6. Install the NI-WSN driver software.

Step 3. Install NI-WSN Software on NI CompactRIO Controller

Complete the following steps to install NI-WSN software on the NI CompactRIO controller for NI 9795 WSN C Series gateway:

1. Launch MAX.
2. Expand **Remote Systems** and click on the NI CompactRIO controller with the NI 9795 installed.
3. Expand the NI CompactRIO controller and click **Software**.
4. Click **Add/Remove Software**.
5. In the Software Selection dialog box, select the recommended NI-RIO software for NI LabVIEW Real-Time. Click **Next**.

6. In the Add-on Selections dialog box, complete the following steps:
   a. Select **Network I/O**.
   b. Expand Protocols and Buses and select the NI-WSN driver software.
   c. Select **Web Features**.
   d. Click **Next**.
7. Click **Next** on the Review Selections dialog box. The software then installs to the target and the target reboots.

Step 4. Configuring the NI WSN System

You must configure the NI WSN devices in MAX or in a Web browser before using NI LabVIEW to take measurements.

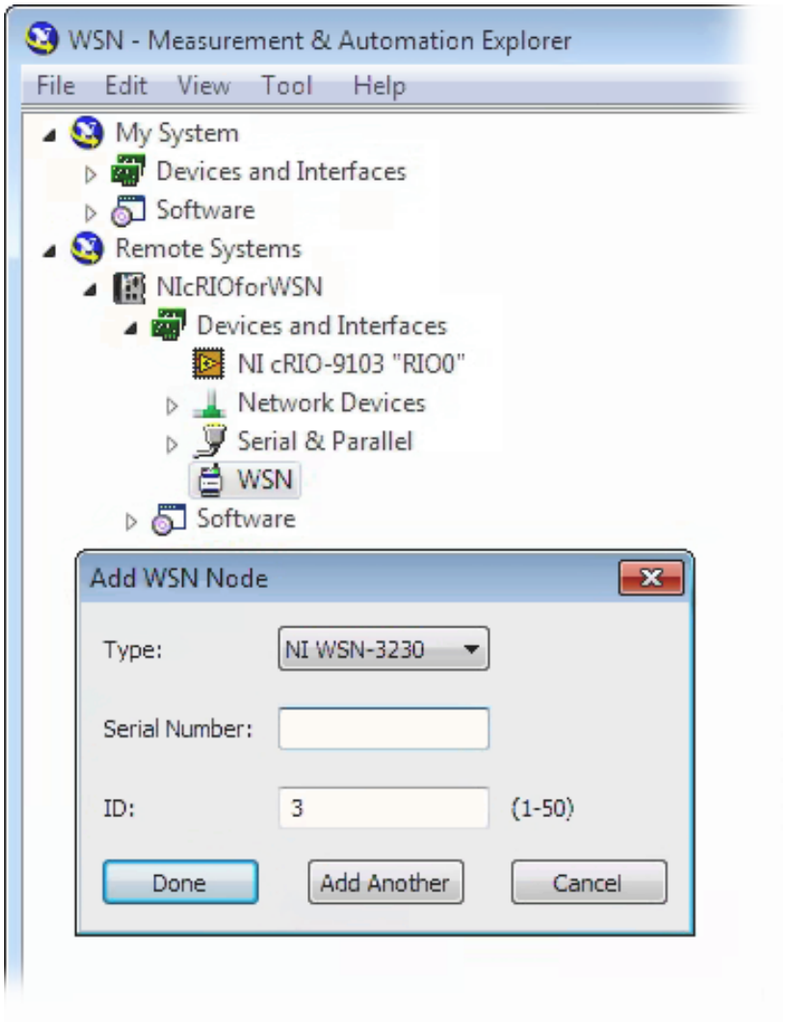
Adding a Node to the NI WSN Gateway

1. Launch MAX.
2. Expand **Remote Systems** and click the NI CompactRIO controller with the NI 9795 installed.

3. Expand the **NI CompactRIO controller**, expand **Devices and Interfaces** and click **WSN**.
4. Select **Add Node**.
5. In the Add Node dialog box:
   a. Select the Type.
   b. Enter the NI WSN-32*xx* device serial number, which is listed on the sticker on the underside of the device, and an ID Number (number between 1 and 50).
6. Click **Done** if you are done adding nodes. If you want to add other nodes, click **Add Another**.



Note Upon completion, these changes are automatically applied.



7. After the nodes are added in MAX, the nodes connect automatically when they are in range of a gateway.

Note If your node does not connect automatically, refer to `ni.com/info` and enter `exxhqv` for troubleshooting information.

For more information about configuring the NI WSN system, refer to **Start»All Programs»National Instruments»NI-WSN» Configuring WSN in MAX**.

Step 5. Attach Sensors and Signal Lines

Attach sensors and signal lines to the terminal block or accessory terminals for each node. For device pinouts, refer to the device documentation.

Step 6. Start Using the NI WSN System

To start using the NI WSN system, complete the following steps:

1. Open a new LabVIEW project.

   If the NI CompactRIO controller is on the local subnet, complete the following steps:

   a. Right-click the project name and select **New»Targets and Devices**. In the Add Targets and Devices on My Project dialog box, select **Existing target or device** and expand the **Real-Time CompactRIO** folder. When you expand the **Real-Time CompactRIO** folder, the network is scanned for any connected NI CompactRIO devices. Wait for device detection.

b. Once detected, select the NI CompactRIO chassis you wish to use and click **OK**.

c. If you have LabVIEW FPGA installed, select **Scan Interface** as the programming mode of the NI CompactRIO device and click **Continue**. This populates the LabVIEW Project window with the NI CompactRIO chassis.



Note The NI 9795 WSN C Series gateway can only be used in a NI CompactRIO chassis that supports the RIO Scan Interface (RSI). For more information, go to `ni.com/info` and enter `rdsoftwareversion`. To use RSI and FPGA at the same time with a NI 9795 in the CompactRIO chassis, go to `ni.com/kb` and enter `4XRBMIUV`.

If the NI CompactRIO device is not on the local subnet, complete the following steps:

a. Right-click the project name and select **New»Targets and Devices**, click **Existing target or device**, and click **Specify a target or device by IP address**.

b. Select **IP Address** and enter the IP address.

c. Expand the **Real-Time CompactRIO** folder and select the NI CompactRIO device type and click **OK**.

d. Right-click the NI CompactRIO device in the project and select **New»Targets and Devices**. Click **Discover an existing target(s) or device(s)**.

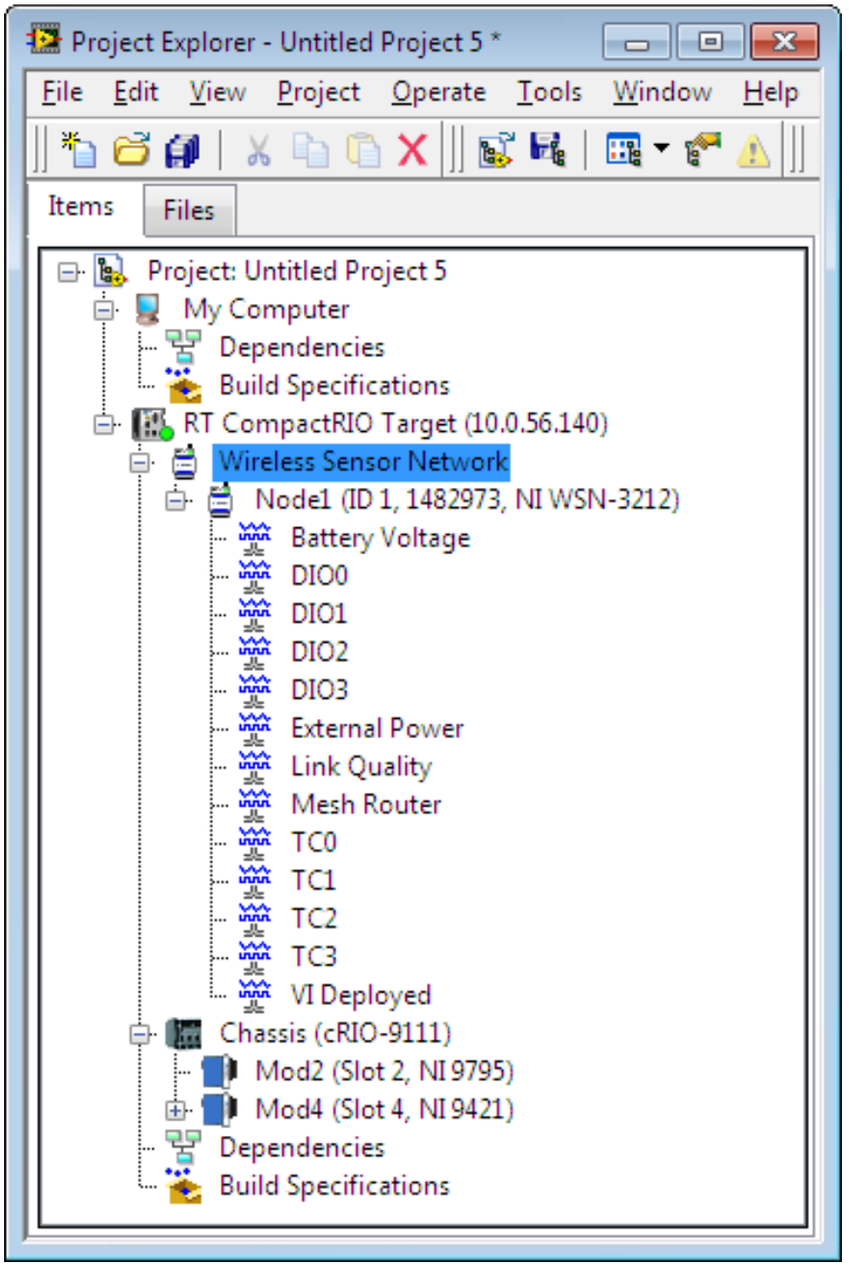
e. Expand the NI CompactRIO chassis and select the NI CompactRIO chassis with the NI 9795 installed that you want to use. Click **OK** and then select **Scan Interface** as the Programming Mode of the NI CompactRIO chassis and click **Continue**.



Note The NI 9795 WSN C Series gateway can only be used in a NI CompactRIO chassis that supports the RIO Scan Interface (RSI). For more information, go to `ni.com/info` and enter `rdsoftwareversion`. To use RSI and FPGA at the same time with a NI 9795 in the CompactRIO chassis, go to `ni.com/kb` and enter `4XRBMIUV`.

2. Right-click on the NI CompactRIO device in the project and select **New»Targets and Devices**.
3. Expand **WSN Node** and select the nodes for use in the project and click **OK**.

4. Expand the listing for the Wireless Sensor Network in the NI LabVIEW project to see the NI WSN-32*xx* nodes connected to it. Expand each node to view the I/O variables.



5. To configure the I/O variables properties (such as Range and Sample Interval), right-click on the node and select **Properties**.
6. To acquire data, create a new VI under My Computer or the NI CompactRIO device, and drag the I/O variable(s) to the block diagram, create an indicator, and click **Run**. For more information about configuring the NI WSN system in NI LabVIEW, select **Help»LabVIEW Help** and enter `WSN`.

Programming Examples

NI LabVIEW includes example programs to help you develop an application. To locate NI LabVIEW examples, go to `ni.com/info` and enter `wsnexamples`. For additional examples, refer to `zone.ni.com`.

Where to Go for Support

The National Instruments Web site is your complete resource for technical support. At `ni.com/support` you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, visit the Worldwide Offices section of `ni.com/niglobal` to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

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