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## Configuring Your Hardware

### Exercise 2-1

### Configure Hardware

#### Goal

Configure the CompactRIO target system and the I/O hardware using MAX.

Throughout the course, you use the CompactRIO (cRIO) system as your RT target.

For more information about configuring real-time targets, refer to the *MAX Remote Systems Help*. Select **Help»Help Topics»Remote Systems** in MAX.

#### Implementation

##### IP Address

1. If you are attending an instructor-led course and your computer is connected to the Internet, disconnect your Ethernet cable.
2. Determine whether your network uses DHCP or static IP addresses.
  - Click **Start**. Select **Control Panel»Network Connections**.
  - Right-click **Local Area Connection** and select **Properties**.
  - Select **Internet Protocol (TCP/IP)** and click **Properties**.

If the **Obtain an IP address automatically** option is selected, your network uses DHCP. Otherwise, your network uses static IP addresses.

- If you are attending an instructor-led course, select **Use the following IP address**.
- Set **IP Address** to 192.168.0.1 and set **Subnet Mask** to 255.255.255.0. Click **OK**.
- Close the Local Area Connection Properties dialog box.

3. Connect the cRIO-9074 to the network. Your system may already be connected.
  - If you are attending an instructor-led course or if the system uses static IP addresses, connect the RT target to the computer using a cross-over cable.



**Note** If you are attending an instructor-led course, gray or orange Ethernet cables are a cross-over cables; regular Ethernet cables are blue.

- If the system uses DHCP, connect the RT target to the nearest hub using an Ethernet cable.

### **cRIO Configuration**

Complete the following steps to wire the system.

1. Connect a power cable to the power supply attached to the side of the temperature chamber.
2. Connect the second power supply to the cRIO-9074 controller.
  - Connect the red wire to a V1 input.
  - Connect the black wire to a C input.
3. Connect a power cable to the power supply now attached to the CompactRIO RT target.
4. Watch the LEDs carefully while the cRIO-9074 controller 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.
5. Wait for the system to boot and confirm that the Power LED remains on after booting. The Status LED might blink continuously and slowly if the unit has not yet been configured. You will see this blinking behavior again later after reformatting the disk on the cRIO target and putting the cRIO into an unconfigured state.
6. Connect the plugs attached to the cRIO modules to the appropriate input on the temperature chamber.

### Reformatting the Controller

Complete the following steps to reformat the disk on the CompactRIO target.

1. Put the CompactRIO target in safe mode. To reformat a CompactRIO target, the target must be in safe mode.

- Set the SAFE MODE switch on the CompactRIO target to the ON position.
- Press the reset button on the CompactRIO target.

The Reset button is a small button on the controller that can be depressed with a small object, such as a pen.

- Wait for the POST to complete. After the POST completes, the STATUS LED will continuously flash three times to indicate that the CompactRIO target is in safe mode.
- Set the SAFE MODE switch on the CompactRIO target back to the OFF position.

2. Launch MAX from the desktop or select **Start»All Programs»National Instruments»Measurement & Automation**.

3. Verify that the CompactRIO target is detected.

- Expand **Remote Systems** in the Configuration tree.
- Verify that the CompactRIO target appears in Remote Systems.
- If no device is listed, refresh the list by clicking **Refresh** or pressing <F5>.

4. Reformat the disk on the CompactRIO target.

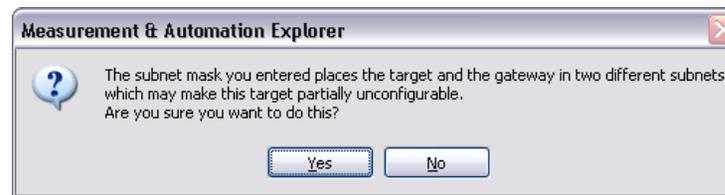
- Right-click the CompactRIO target in Remote Systems and select **Format Disk**.
- Click **Yes** in the dialog window asking if you would like to continue.
- A dialog window will appear when the disk on the CompactRIO has been formatted successfully. Click **OK** in this dialog window to reboot the target.

### Configuring the Controller

If you are using a crossover Ethernet cable to connect your CompactRIO target to your host computer, you must set the host computer to a static IP address.

1. Verify that the CompactRIO target is detected.
  - Expand **Remote Systems** in the Configuration tree.
  - Verify that the CompactRIO target appears in Remote Systems.
  - If no device is listed, refresh the list by clicking **Refresh** or pressing <F5>.
2. Check the IP address for the CompactRIO RT target.
  - Select the CompactRIO target and view the **Network Settings** tab.
  - Verify that the IP Address of the target has been reset to 0.0.0.0.
3. Determine the IP Address of the host computer.
  - Select **Start»Run** and enter `cmd` to open a command prompt.
  - At the command prompt, enter `ipconfig` to find the IP address and Subnet mask values for the host computer. Enter them below.
    - Host computer IP address: \_\_\_\_\_
    - Host computer subnet mask: \_\_\_\_\_
  - Reset the CompactRIO RT target IP address.
    - Select the CompactRIO RT target under Remote Systems and click the **Network Settings** tab.
    - Use the host computer subnet mask value for the subnet mask on the CompactRIO RT target.
    - For the IP Address of the CompactRIO RT target, use the first three numbers of the host computer IP address and a different fourth number between 0 and 255.
    - Set the Gateway and DNS Server to blank values.

- Record the IP address and Subnet mask values for the CompactRIO RT target for future reference.
  - IP Address: \_\_\_\_\_
  - Subnet mask: \_\_\_\_\_
- 4. Enter the name `cRIO-9074` in the **Name** field of the Identification section.
- 5. Click **Apply** to save the configuration.
  - If the Measurement & Automation Explorer dialog box in Figure 2-1 displays, click **Yes**.



**Figure 2-1.** Target and Gateway in Two Different Subnets Warning

- 6. Click **Yes** when prompted to reboot the RT target.
- 7. In MAX, select **View»Refresh**.
- 8. Verify that the correct software is installed on your system.
  - Select **Software** in the Configuration tree under `cRIO-9074`.
  - Click the **Add/Remove Software** button.

- ❑ Select **LabVIEW Real-Time 8.6»NI-RIO 3.0.0 with Scan Engine support** and click **Next**, as shown in Figure 2-2.

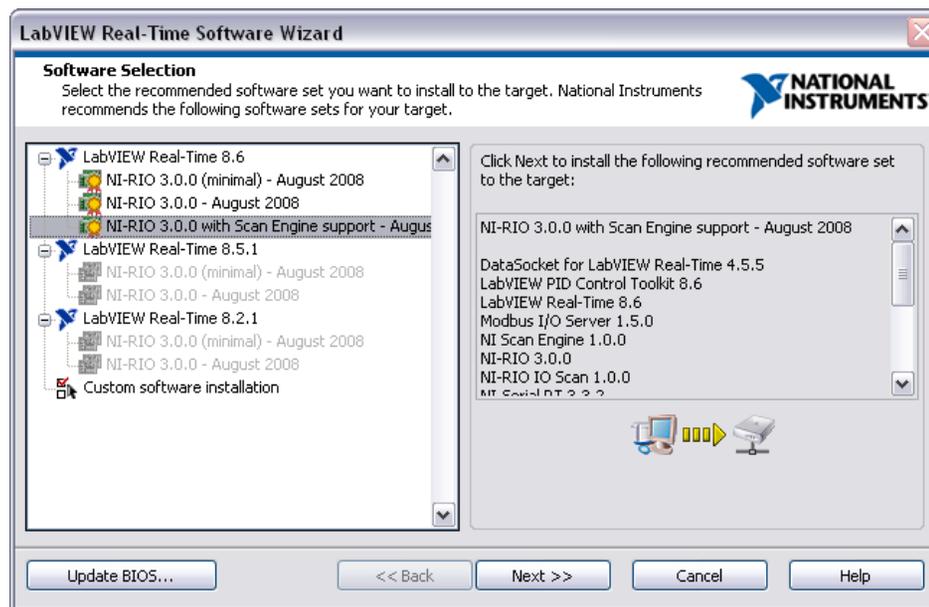


Figure 2-2. LabVIEW Real-Time Software Wizard

- ❑ Review the installation selections and click **Next** to begin the installation.
- ❑ After the software is installed, click **Finish** to exit the LabVIEW Real-Time Software Wizard.

9. Examine the software installed on the CompactRIO by displaying the software and folder hierarchy in a browser with FTP.
  - Open Windows Explorer.
  - Enter `ftp://<IP Address>/` where *IP Address* is the IP address of the CompactRIO target.
  - Examine the folder contents and the dates modified.
  - Close Windows Explorer.
10. Identify the chassis used in the target.
  - In MAX, expand **Devices and Interfaces** under cRIO-9074 in the Configuration tree.
  - Verify that **RIO0** is displayed.
  - Click the **RIO0** item to view the information available in the **General** tab.

## End of Exercise 2-1