How to Configure Your cRIO
2011 FRC – *LogoMotion*

HOW TO CONFIGURE YOUR CompactRIO

All FRC teams, both Rookie and Veteran teams, must configure/reconfigure the cRIO in preparation for the 2011 season. The cRIO Imaging Tool is preloaded on the Classmate and is also available on the Software Disks included in the Kit of Parts.

Set the Static IP Address of the Computer you are using for development

Note: This is for Windows XP. The steps for Windows 7 will look slightly different.

1. Select Start»Control Panel»Network Connections»Local Area Connection to display the Local Area Connection Properties dialog box.
2. On the General page, select Internet Protocol (TCP/IP)
3. Click the Properties button to display the Internet Protocol (TCP/IP) Properties dialog box.
4. Select the Use the following IP address option.
5. In the IP address text box, if this computer is the Classmate and you have run the Driver Station software and successfully set your team number, you should see 10.xx.yy.5, where xx corresponds to the first one or two digits of your team number and yy corresponds to the last two digits of your team number. If this is not the classmate PC you should set the address to 10.xx.yy.6 as the Driver Station defaults to 10.xx.yy.5 for its IP address. In this text box, change the final digit .5 to .6.

Team Number	Static IP Address
45	10.0.45.6
234	10.2.34.6
1024	10.10.24.6

6. The Subnet mask text box defaults to 255.0.0.0. Use this default value.
7. Click the OK button twice to close the Internet Protocol (TCP/IP) Properties and Local Area Connection Properties dialog boxes.
8. Click the Close button to close the Network Connections dialog box.

Considerations Before Running the cRIO Imaging Tool

Before configuring the cRIO with the cRIO Imaging Tool, you must ensure that the hardware and software are configured properly.

Do not use the cRIO Imaging Tool on the cRIO over a wireless connection. If the connection is lost, the data that the cRIO Imaging Tool writes to the cRIO will be corrupted.

Do not use Measurement and Automation Explorer (MAX) to install additional software on the cRIO. MAX overwrites the FRC VIs on the cRIO, which makes the cRIO unusable for the FRC competition. If you use MAX to install additional software on the cRIO, you must use the cRIO Imaging Tool to restore the device to a usable state.

Before running the cRIO Imaging Tool, ensure the SAFE MODE switch on the cRIO is turned off. For routine use, do not use the cRIO Imaging Tool when the cRIO is in SAFE MODE.

Severe corruptions of the software or settings on the cRIO result in the device no longer functioning. If the cRIO is corrupted or if the IP Address is set incorrectly, the device boots only in SAFE MODE. When this occurs, switch the device into SAFE MODE. The cRIO Imaging Tool offers to reformat the disk. After the disk has been reformatted, switch the cRIO out of SAFE MODE, reboot, and run the cRIO Imaging Tool normally.

Running the cRIO Imaging Tool

Complete the following steps to configure the cRIO with the cRIO Imaging Tool.

1) Select Start»All Programs»National Instruments(folder)»LabVIEW 8.6»FRC cRIO Imaging Tool to launch the cRIO Imaging Tool dialog box. You also can display this dialog box by selecting Tools»cRIO Imaging Tool in LabVIEW.
2) Select the cRIO you want to configure from the Select cRIO Device table. This table lists all cRIO devices connected to the host computer.
3) In the Development Environment section, specify whether you want to run and debug LabVIEW, C/C++, or Java .
    a. When developing robot code using LabVIEW it is recommended that the "Always run deployed code at startup" option be selected.
4) Place a checkmark in the Format Controller checkbox. Use the Format Controller section to restore an image on the cRIO or update the cRIO with a new name or team ID.
5) From the Select Image list, select the most recent FRC_2010_xx.zip file to download the FRC_2010_xx image to the cRIO. The FRC_2010_xx image consists support for LabVIEW, C/C++, and Java program.
6) Enter the name you want to use to identify the cRIO in the Device name text box.

7) Enter your team number in the Team ID field. The cRIO Imaging Tool sets the IP address of the cRIO to 10.xx.yy.2, where xx corresponds to the first or first two digits of the team number and yy corresponds to the last two digits of the team number.

8) Click the Apply button to apply the changes you made and download the FRC_2010_xx image to the cRIO. Do not turn off power to the cRIO or interfere with the network connection while the cRIO Imaging Tool downloads the image to the cRIO.

9) When the reconfiguring device window states the CompactRIO image was successfully updated, close the window, turn the cRIO off by shutting down the power, then turn it back on to load the new image.

If you want to switch to another development environment, select the new development environment from the Choose Development Environment section and click the Apply button. Switching development environments does not reformat or download a new image to the cRIO.

Refer to the LabVIEW Robotics Programming Guide for the FIRST Robotics Competition for more information about the cRIO and other programming procedures. You can access this guide by selecting the Robotics Programming Guide link on the LabVIEW Getting Started window, by navigating to the National Instruments\LabVIEW 8.6\manuals directory and opening FRC_Getting_Started.pdf, or by searching ni.com.

Using the Classmate with your cRIO

1) Log into the Driver Account

Figure 1: Login screen with the two available accounts

2) Plug the following devices into your Classmate

- USB Hub
- Joysticks (into the USB Hub)
- E-Stop button (into port 1 on the USB Hub)
- cRIO using the orange crossover Ethernet cable (via the only Ethernet port on the Classmate and port 1 on the cRIO)

Figure 2: The basic Driver Station setup with simulated robot (cRIO, motors, etc)

3) Turn on your cRIO using the 120A main circuit breaker (make sure that the Analog Breakout Board is attached to the 9201 module in slot 1 of your cRIO and that it has the jumper installed for battery voltage tracking).
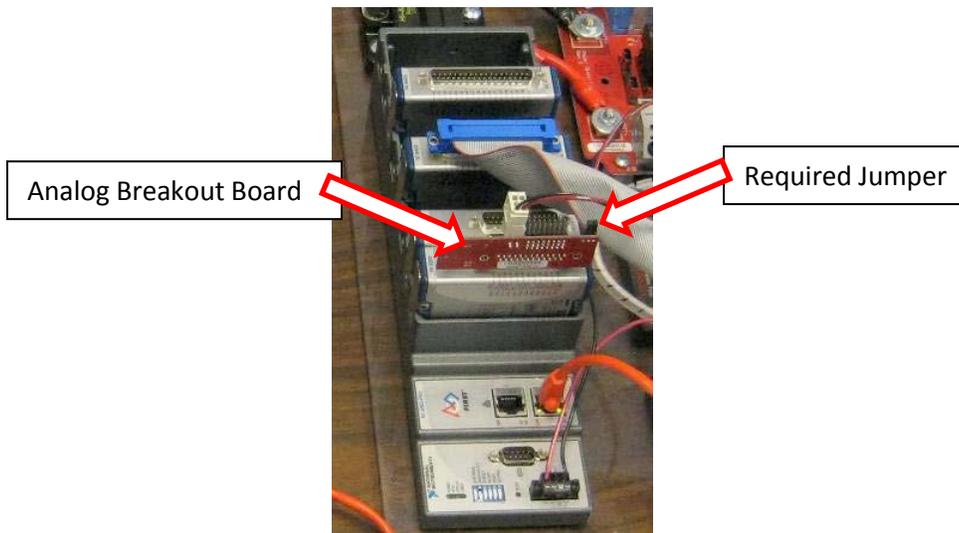
Figure 3: The cRIO should have a 9201 module in slot 1 with the accompanying Analog Breakout board installed and wired

4) On the left side of the Driver Station window, check the status indicators to confirm that the Classmate has communication with the cRIO (meaning that IP addresses are set and the cRIO has been imaged), This will be indicated with a green light next to Communications.
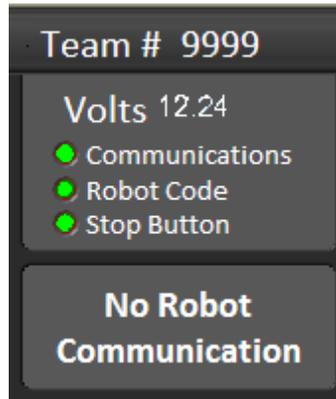
Figure 4: Status indicators relay crucial information about system performance.

5) In the Setup Tab, confirm that the Driver Station recognizes your joysticks. Joysticks should be listed in green. If the joysticks were not connected or recognized hit F1 to cause the DS to re-enumerate the USB joystick devices.