# Test, Change IP and Upgrade Firmware on sbRio robots

- <u>Test Robots</u>
- Robot Battery Test
- Upgrade Firmware
- Change IP

#### **Test Robots**



1. Open MicSourceLocator.lvproj from ESE297 webpage

| 😰 Real-Time Single-Board RIO Properti   | 25                    |
|---|-----------------------|
|   |                       |
| General                                 | General               |
| Conditional Disable Symbols             |                       |
| VI Server                               | Name                  |
| Web Server<br>User Access               | Robot0                |
| Host Environment                        | IP Address / DNS Name |
| Miscellaneous                           | 172.16.19.51          |
| MathScript: Search Paths<br>Scan Engine |                       |
|   |                       |
|   |                       |
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|   |                       |
|   |                       |
|   |                       |
|   | <b>v</b>              |
|   | OK Cancel Help        |
|   |                       |

- 2. Right Click on Robot0 and select Properties and change the IP to match the label on your robot.
- 3. Double click on Robot0 -> RobotMicSourceLocator.vi



- 4. Click the Run Arrow
- 5. Make sure that the Left Gain and the Right Gain on top of the Preamp is turned up to +48dB and that the Mix (on bottom) is in the middle and the Level (on bottom) is set to 10 and that the Phantom switch is ON. Verify that the Mic0 only activates the white trace and Mic1 only activates the red trace

| MicSourceLocator-Robots.vi                       |            |            |
|--|------------|------------|
| File Edit View Project Operate Tools Window Help |            |            |
| 👚 🔁 🔘 🗉  |            | <b>? 4</b> |
| MicroPhonePairs                                  | MayaPabata | Î          |
|  |            |            |
|  | Stop       |            |
| d Rotation d Rotation                            | Motor      |            |
|  | Moving     |            |
| p p  |            |            |
| Thetas   |            | E          |
| 400  |            |            |
|  |            |            |
|  |            |            |
|  |            |            |
|  |            |            |
| MicSourceLocator.lvproj/My Computer  <           |            | ► <u>.</u> |

- 6. Double click on My Computer -> MicSourceLocator-Robots.vi and click the Run arrow.
- 7. Make sure that the Motor Moving light turns off after a few seconds and that Thetas[0] counts up.
- 8. Click MoveRobots and make sure that both wheels move in opposite directions ¼ of a rotation.

### **Battery Test on Robots**

- 1. Follow instructions to test robots and verify all is working
- 2. Copy BatteryTest.vi from Ed's to your MicSourceLocator folder
- 3. Add BatteryTest.vi to your project under My Computer
- 4. Run Robot0 -> RobotMicSourceLocator.vi
- 5. Run My Computer -> BatteryTest.vi. This will move the motor every 5 seconds. The Iteration indicator should stop updating when the battery dies.

#### **Upgrade Firmware**

- 1. Plug in sbRio robot to active Ethernet port
- 2. Push Dip Switch 3 to the down position (IP Reset)
- 3. Launch NI-MAX



4. Click on the arrow to the left of Remote Systems



5. Right Click on Remote Systems -> sbRIO -> Software and select Add/Remove Software

| LabVIEW Real-Time Software Wizard: NI-sbRIO9631-1463EB1 (172.16.19.54)                      |   |  |
|---|---|--|
| Select the recommended software set to inst<br>recommends the following software sets for y | call. National Instruments VINATIONAL vour target.  |  |
| LabVIEW Real-Time 14.0.1  | Click Next to reinstall the currently installed software:   |  |
| Custom software installation  | NI CompactRIO 14.5 - February 2015 CompactRIO Support 14.5 LabVIEW Real-Time 14.0.1 Language Support for LabVIEW RT 1.0.0.5 NI-RIO 14.5 NI-VISA 14.0.0 NI-VISA Server 14.0.0 Available add-ons: DataSocket for LabVIEW Real-Time 5.2.0 EPICS Client I/O Server 14.0.0 EPICS Server I/O Server 14.0.0 HTTP Client 14.0.0 |  |
| 4   |   |  |
| Update BIOS << Back   | Next >> Cancel Help   |  |

6. Select latest version under LabVIEW Real-Time and click Next >>

| LabVIEW Real-Time Software Wizard: NI-sbRIO-9631-(   | 0148CCC5 (172.16.2.70)   |
|--|--|
| (Optional) Select the software set add-ons ye  | ou want to install.  |
| NI CompactRIO 14.5 - February 2015   | Click "Next" to install the Recommended Software Set and the<br>selected add-ons to the target.<br>NI System Configuration API provides libraries and other files<br>necessary to support applications that discover and<br>configure systems and devices.<br>This add-on will be installed to the target. |
| Variable Legacy Protocol Support 5.6.0         Variable Legacy Protocol Support 5.6.0         Variable Legacy Server Support 5.6.0         NI Scan Engine         NI-RIO IO Scan 14.5         NI-Serial 9870 and 9871 Scan Engine Suppo         Protocols and Buses         DataSocket for LabVIEW Real-Time 5.2.0         Variable Legacy Server Support 5.6.0         Variable Legacy Server Support 5.6.0         Update BIOS | Next >> Cancel Help  |

| LabVIEW Real-Time Software Wizard: NI-sbRIO-9631-0148CCC5 (172.16.2.70) |   |  |  |
|---|---|--|--|
| (Optional) Select the software set add-ons you want to install.         |   |  |  |
| NI CompactRIO 14.5 - February 2015                                      | <text><text><text></text></text></text> |  |  |
| Update BIOS << Back   | Next >> Cancel Help                     |  |  |

| LabVIEW Real-Time Software Wizard: NI-sbRIO-9631-0   | 148CCC5 (172.16.2.70)   |
|--|---|
| (Optional) Select the software set add-ons yo  | u want to install.  |
| NI CompactRIO 14.5 - February 2015<br>Vision Features<br>NI Vision RT 14.5.0<br>USB3 Vision Support 14.5.0<br>Web Features<br>Hardware Configuration Web Support 14.5.<br>HTTP Client 14.0.0<br>HTTP Client with SSL Support 14.0.0<br>HTTP Client with SSL Support 14.0.0<br>NI Application Web Server 14.5.0<br>NI Application Web Server 14.5.0<br>NI Web-based Configuration and Monitoring<br>Remote Panel Server for LabVIEW RT 14.5.1<br>Run-Time Engine for Web Services 14.5.0<br>SMTP Client 14.5.0<br>SMTP Client with SSL Support 14.5.0<br>SMTP Client with SSL Support 14.5.0<br>WebDAV Client 14.0.0<br>WebDAV Client 14.0.0<br>WebDAV Client with SSL Support 14.0.0<br>WebDAV Client with SSL Support 14.0.0<br>WebDAV Client with SSL Support 14.0.0<br>WebDAV Client 14.0.0<br>WebDAV Server 14.0.0 | Click "Next" to install the Recommended Software Set and the selected add-ons to the target.<br>NI System Configuration API provides libraries and other files necessary to support applications that discover and configure systems and devices.<br>This add-on will be installed to the target. |
| Update BIOS << Back  | Next >> Cancel Help   |

7. The Defaults use too much memory. You need to change to uncheck LabVIEW RT Add-ons and Click Next>>. The defaults selections are fine.

| LabVIEW Real-Time Software Wizard: NI-sbRIO9631-1463EB1 (172.16.1.118)   | ×    |
|--|------|
| Review the following summary before continuing.  |      |
| Features to be installed or reinstalled:<br>CompactRIO Support 13.1 DataSocket for LabVIEW Real-Time 5.1.0 EPICS Server I/O Server 13.0.0 HTTP Client 13.5.0 HTTP Client with SSL Support 13.5.0 LabVIEW PID and Fuzzy Logic Toolkit 13.0.0 LabVIEW Real-Time 13.0.1 Language Support for Japanese 13.0.1 Language Support for LabVIEW RT 1.0.0.5 Modbus I/O Server 13.0.0 NI System Configuration 5.6.0 NI-RIO 13.1 NI-Serial RT 4.0.0 NI-VISA 5.4.1 NI-VISA ENET Passport 5.4.1 NI-VISA ENET Passport 5.4.1 NI-VISA Pare Passport 5.4.1 VI-VISA Server 5.4.1 VI-VISA Server 5.4.1 VI-VISA Server 5.4.1 VI-VISA Server 5.4.1 VI-VISA Bassport 5.4.1 VI-VISA Server 5.4.1 VI-VISA USB Passport 5.4.1 VI-VISA Server 5.4.1 VI-VISA Server 5.4.1 VI-VISA USB Passport 5.4.1 VI-VISA Server 5.4.1 VI-VISA USB Passport 5.4.1 </th <th></th> |      |
| Update BIOS << Back Next >> Cancel   | Help |

#### 8. Click Next >>

| Confirm Save | ×  |
|--------------|--|
|              | The item NI-sbRIO9631-1463EB1 has not been saved, would you like to save it? |
|              |  |
|              |  |
|              | Yes Yes to All No Cancel   |

9. Click Yes to All

| LabVIEW R | Real-Time Software Wizard: NI-sbRIO9631-1463EB1 (172.16.1.118) | ×    |
|-----------|--|------|
| Progress. |  |      |
|           | Current Component:   |      |
|           | Checking target and rebooting into install mode.               |      |
|           |  |      |
| Update E  | BIOS << Back Next >> Cancel                                    | Help |

10. Wait patiently – this takes a few minutes. Click Finish when done.

## Change IP

| RI-sbRIO9631-1463EB1 - Measurement | t & Automation Explorer        |                                |  |
|------------------------------------|--------------------------------|--------------------------------|--|
| <u>Eile Edit View Tools H</u> elp  |                                |                                |  |
| 🔺 🜉 My System                      | 🕛 Restart 🛛 🔒 Save 🛛 🔂 Refresh | 🔒 Set Permissions 🛥 Log In     | Y Hide Help  |
| Data Neighborhood                  |                                |                                | 🔁 Back 🗖 🔺   |
| Historical Data                    | Network Adapters               |                                |  |
| Scales                             |                                |                                | LabVIEW Real-                                      |
| Software                           | Ethernet Adapter ethernet      | h0 (Primary)                   | Time Target  |
| ▷ IVI Drivers                      | Adapter Mode                   | TCP/IP Network                 | Complete the following                             |
| Kemote Systems                     | MAC Address                    | 00:80:2E:11:E0:29              | steps to configure your                            |
| Devices and Interfaces             |                                | 000001211220125                | with the LabVIEW Real-                             |
| ⊳ 🔄 Software                       | Configure IPv4 Address         | DHCP or Link Local             | more complete                                      |
|                                    | IPv4 Address                   | 172.16.1.118                   | steps, refer to the                                |
|                                    | Subnet Mask                    | 255.255.248.0                  | LabVIEW Real-Time<br>Target Configuration          |
|                                    | Gateway                        | 172 16 7 254                   | <u>Tutorial</u> ,                                  |
|                                    | DNS Server                     | 128 252 0 100                  | 1. Boot into LabVIEW<br>Real-Time                  |
|                                    | b Mara Sattinga                | 126.252.0.100                  | 2. Configure Network                               |
|                                    | ► More Settings                |                                | Settings   |
|                                    |                                |                                | 3. Install Software                                |
|                                    |                                |                                | 1 Sanfarma 1/0                                     |
|                                    |                                |                                | 4. <u>Configure 1/O</u>                            |
|                                    |                                |                                | 5. <u>Configure System</u><br><u>Settings</u>      |
|                                    |                                |                                | 6. <u>Configure Time</u><br><u>Settings</u>        |
|                                    |                                |                                | 7. <u>Transfer User Files</u> 🔻                    |
|                                    |                                |                                |  |
|                                    |                                |                                | Context Help                                       |
|                                    |                                |                                | This window displays                               |
|                                    |                                |                                | context-sensitive help.<br>Move the cursor over a  |
|                                    |                                |                                | control or indicator for<br>more information about |
|                                    |                                |                                | it.  |
|                                    |                                |                                |  |
|                                    |                                |                                | Submit feedback                                    |
|                                    |                                |                                |  |
|                                    | 🔄 System Settings 👰 Network Se | ettings 👿 Time Settings 💡 Help | Visit vi.com/support for                           |
|                                    | _                              | + Connecte                     | d - Running  |

1. Click on Network Settings and change Configure IP4 Address to Static. Then change the IP to match label on robot. Subnet Mask is 255.255.255.0. Click Save.



- 2. Click No. Then switch Ethernet cable to wireless adapter and reboot sbRio manually.
- 3. Open a Command Window and make sure you can ping the new IP from the computer.