

Send Axis Camera Signal Directly to Dashboard

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Introduction

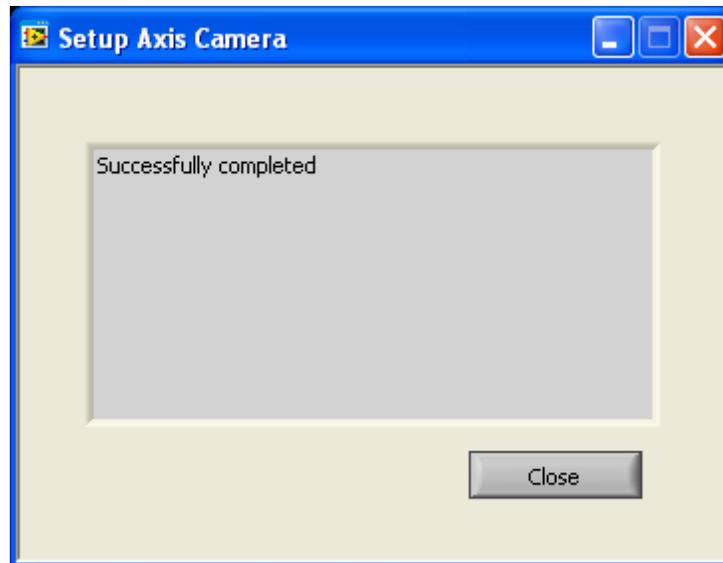
In the default configuration, the Axis Camera's signal is sent to the CompactRIO for processing. In this tutorial we will discuss how you can change the physical configuration and LabVIEW Dashboard code to send the camera signal directly to your PC.

Why Change the Camera Signal Routing?

Depending on how you wish to use the image coming from the Axis Camera, you may or may not want to make this modification. The default configuration is ideal for quick in-the-loop analysis, and offers a faster response in your program logic. For example, if you are creating a color following program, you would want the CompactRIO to be able to analyze the image and respond to that information as quickly as possible. In this case, it would be best to leave the configuration unchanged. On the other hand, you might just want to use the Axis Camera to relay an image directly back to the driver on the Dashboard Front Panel. In this situation, the signal will stream to the computer much more quickly and will reduce the load on the CompactRIO. You will have to decide for yourself which configuration to use.

Configuring the Camera

In order to achieve this modified behavior in your program, the first step is to configure the camera itself. Power the camera up and connect it directly to your PC with a crossover cable. The default IP address of the Axis Camera is 192.168.0.90, so we'll need to change your PC's settings in order to connect. Set the IP address of your PC to 192.168.0.11 and run the **Setup Axis Camera** tool that is installed with LabVIEW FRC. If the camera is set to its default IP address, the tool will run successfully (as shown below).

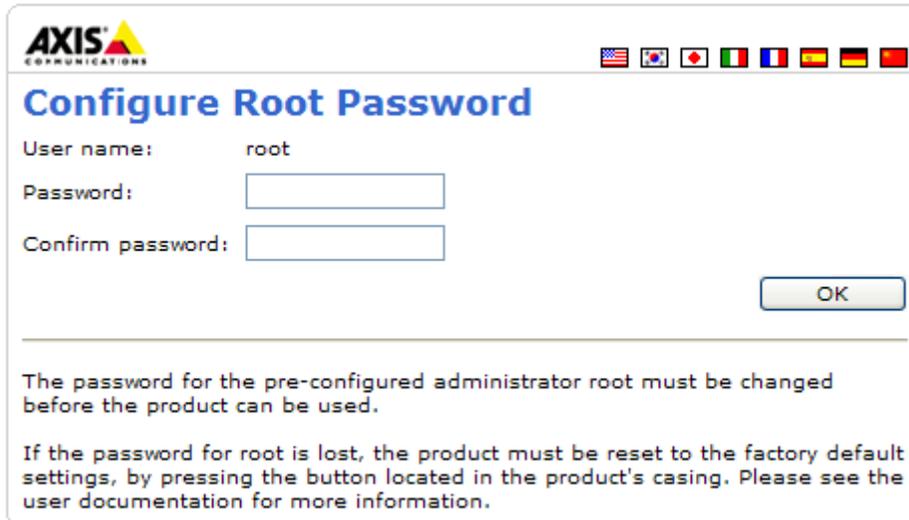


If the tool fails, as shown below, you will need to reset the Axis Camera.



To reset the Axis Camera, hold down the reset button on the back of the camera and then plug in power. Be sure to keep the button held down until the orange lights on the camera face turn on. Once the green lights appear on the camera face, run the **Setup Axis Camera** tool again. It should run successfully.

After the tool executes, open an internet browser and navigate to 192.168.0.90. You will be prompted with the Axis Communication password configuration window, as shown below. Enter `FRC` in both password fields and click **OK**.



Configure Root Password

User name: root

Password:

Confirm password:

OK

The password for the pre-configured administrator root must be changed before the product can be used.

If the password for root is lost, the product must be reset to the factory default settings, by pressing the button located in the product's casing. Please see the user documentation for more information.

This will be followed by a server login prompt window, which is shown below. Enter FRC for both user name and password.



Connect to 192.168.0.90

The server 192.168.0.90 at / requires a username and password.

Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).

User name:

Password:

Remember my password

OK Cancel

This will bring you to the Live View page of the Axis Camera's web interface. If everything is working correctly, you should see a live feed from your Axis Camera on this page. Now that we have access to the camera, we need to configure its IP settings.

In the upper right corner of the web page, click **Setup** to access the camera's settings. Under the **Basic Configuration** heading, click **TCP/IP**. As shown below, enter 10 . xx . yy . 11 for the IP address, where xx . yy is your team number. Delete any text from the **Default router** field, so your page matches the one shown below.

The screenshot shows the web interface for an AXIS 206 Network Camera. The top navigation bar includes the AXIS logo, the camera model name "AXIS 206 Network Camera", and links for "Live View", "Setup", and "Help". On the left, a sidebar menu lists "Basic Configuration" (with sub-items: Instructions, 1. Users, 2. TCP/IP, 3. Date & Time, 4. Video & Image), "Video & Image", "Live View Config", "System Options", "Language" (with a US flag icon), and "About". The main content area is titled "Basic TCP/IP Settings" and contains several sections:

- Network Settings:** A "View" button to see current settings.
- IP Address Configuration:** Radio buttons for "Obtain IP address via DHCP" (unselected) and "Use the following IP address:" (selected). Below are input fields for "IP address:" (10.xx.yy.11), "Subnet mask:" (255.255.255.0), and "Default router:" (empty). A "Test" button is next to the IP field.
- Services:** A checked checkbox for "Enable ARP/Ping setting of IP Address". Below are "Settings..." buttons for "Options for notification of IP address change" and "AXIS Internet Dynamic DNS Service".

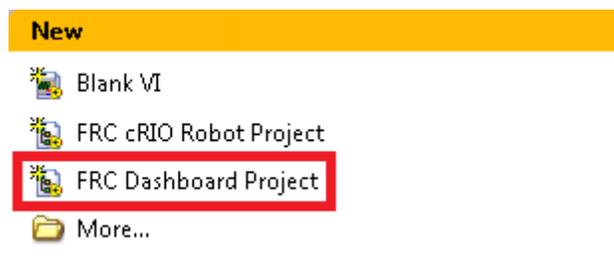
 At the bottom of the settings area are "Save" and "Reset" buttons. A footer note says "See also the [advanced TCP/IP settings](#)".

Click **Save** at the bottom of this page to change the camera's settings and click through the dialog warning you that connectivity to the camera may be lost. With the camera's IP address changed, you can now change your PC's address back to the expected 10 . xx . yy . 6.

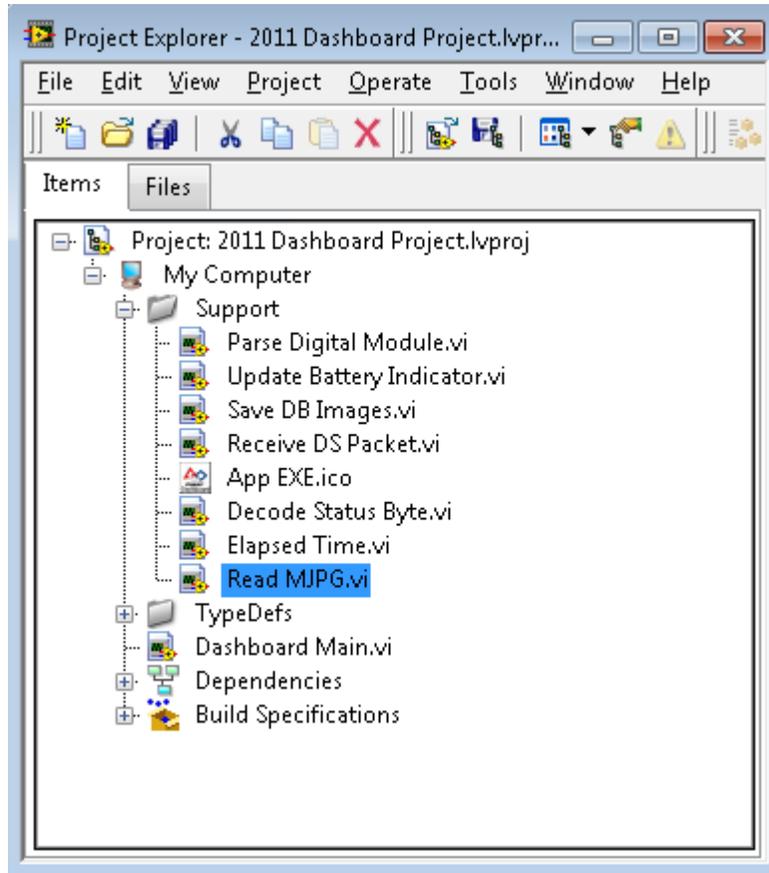
To confirm that the settings were committed correctly, return to your web browser and navigate to 10 . xx . yy . 11. When prompted with the server login window once again, use FRC for the user name and password. If you see the live feed coming from the Axis Camera on the Live View page, the camera configuration is complete! You can remove the crossover cable and connect the Axis Camera directly to your D-Link router. After rearranging your physical network connections, it is a good idea to check the Live View web interface one last time to ensure your network arrangement is valid.

Modifying Your Dashboard Code

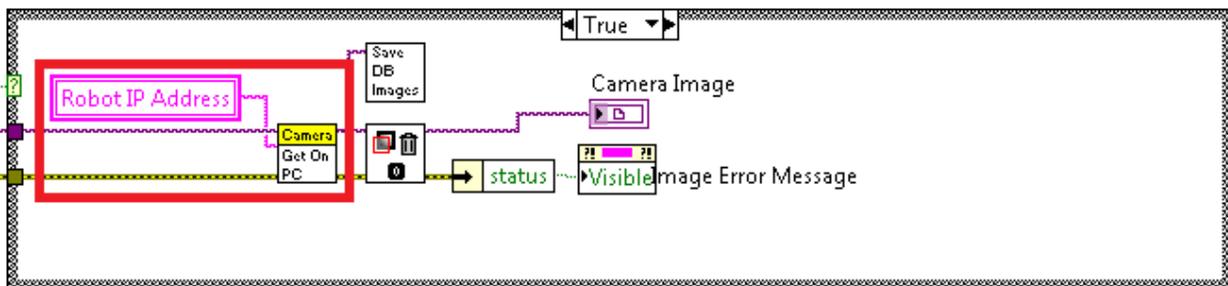
Now that the camera is configured properly, you need to modify your Dashboard code. First, download the attached Read_MJPEG.vi and save it in the same folder as your other VIs. If you do not already have a Dashboard project, create one by selecting **FRC Dashboard Project** from the LabVIEW Getting Started window.



Once you have a Dashboard Project, we need to add the new Read MJPG VI to it. In the Project Explorer window, right-click on the Support folder and navigate to **Add»File**. Find Read MJPG.vi and click **Add File**. You should now see this VI appear in the Support folder's contents.

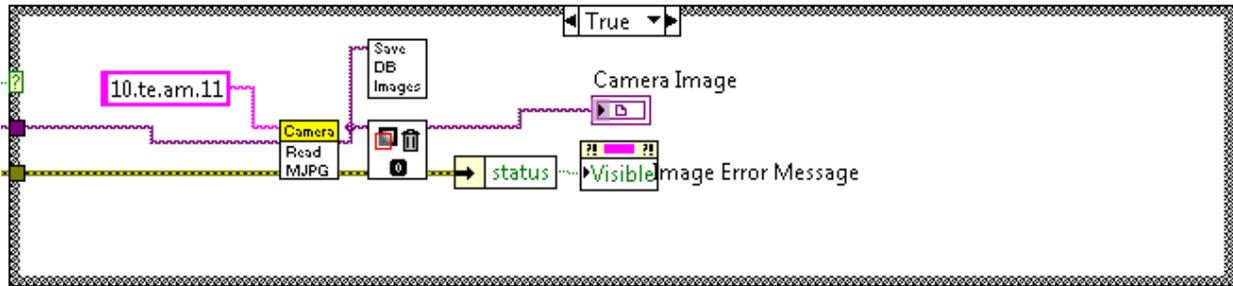


Open Dashboard Main.vi and view the Block Diagram. The section of code we need to modify is contained in the TRUE case of the Case Structure in the upper While Loop of this VI. This section is highlighted in the box below.



Contained in the box above is a “Robot IP Address” Local Variable and the WPI_CameraGet Image From Controller VI. To begin, right-click on the Get Image From Controller VI and navigate to **Replace»All Palettes»Select a VI**. Once again, find Read MJPG.vi and click **OK**. You will see the icon on the Block Diagram change, but the input and output wires should remain connected. Next, delete the Local

Variable and its wire. Right-click on the **address** terminal of the Read MJPG VI and select **Create»Constant**. This will leave you with the code shown below.



As you've probably already guessed, you'll need to change the `te.am` text to fit the usual `xx.yy` IP scheme. Run the Dashboard Main VI and verify that a live image from the Axis Camera appears on the Front Panel.

Conclusion

You have now configured your Axis Camera to send data directly to your PC. Should you choose to revert back to the default camera setup, you can always reconfigure the camera and regenerate the default LabVIEW code.