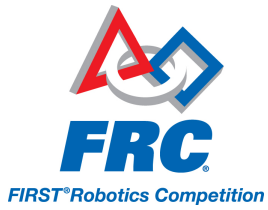
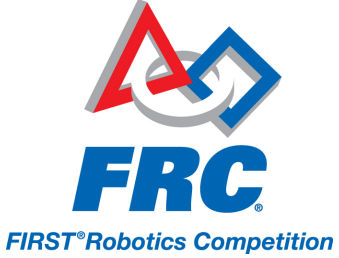
Vision Processing - More information Coming Soon



FIRST® Robotics Competition

Table of Contents



Setup

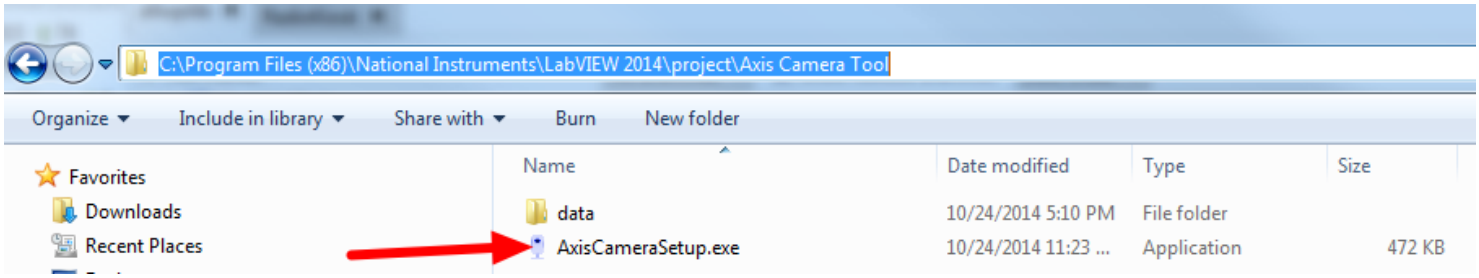
Configuring an Axis Camera

Three different Axis camera models are supported by the FRC software, the Axis 206, Axis M1011 and Axis M1013. This document provides instructions on how to configure one of these cameras for FRC use. To follow the instructions in this document, you must have installed the NI 2015 FRC Update Suite and Configured your radio

Connect the camera

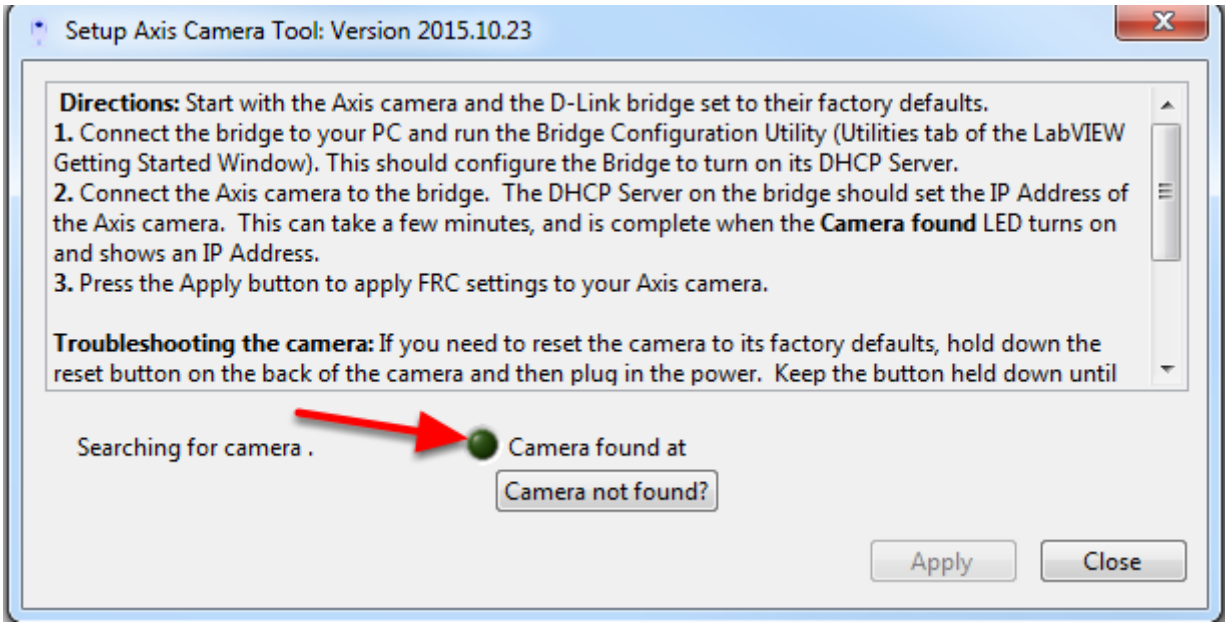
Connect the Axis camera to the DAP-1522 radio using an Ethernet cable. Connect your computer to the radio using an ethernet cable or via a wireless connection.

Launch the Setup Axis Camera Tool



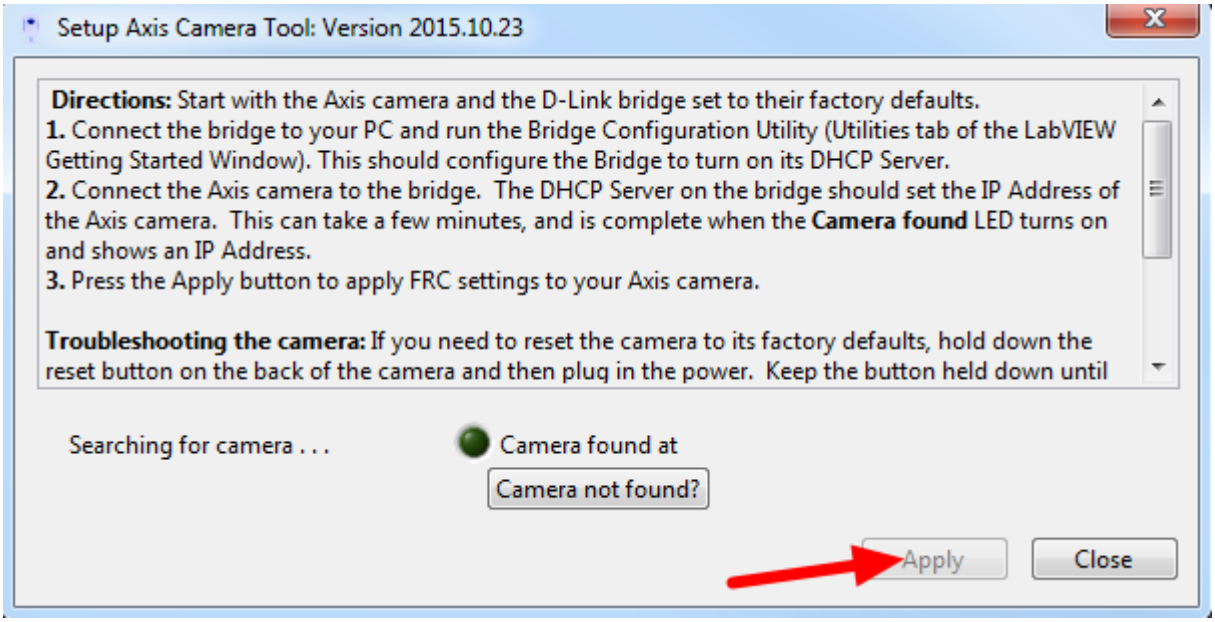
Browse to **C:\Program Files (x86)\National Instruments\LabVIEW 2014\project\Axis Camera Tool** and **double-click** on **AxisCameraSetup.exe** to start the Axis Camera Setup Tool.

Setup Axis Camera Tool



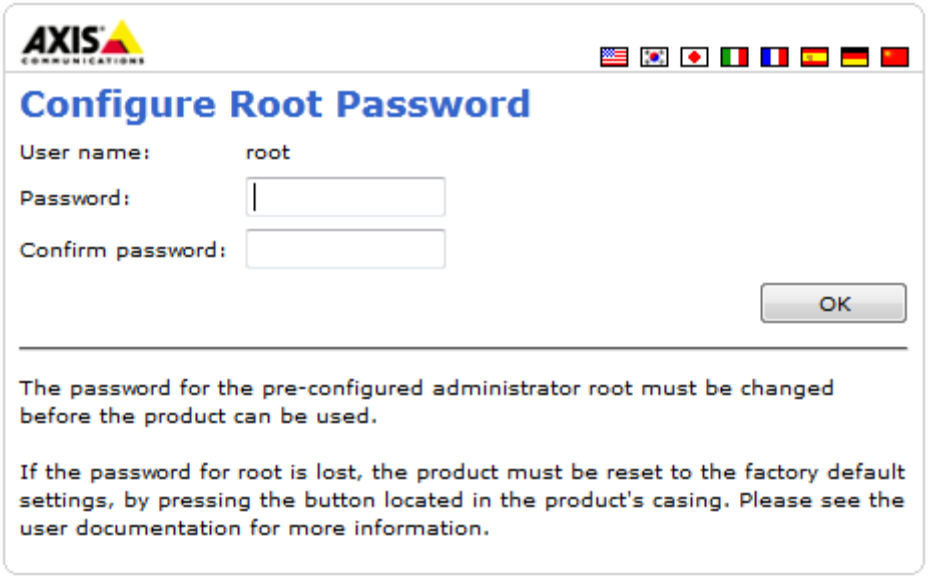
The camera should be automatically detected and the green indicator light should be lit. If it is not, make sure the camera is powered on (the ring on the camera face should be green) and connected to your computer. If the indicator remains off follow the instructions in the tool textbox next to **Troubleshooting the camera** to reset the camera. You can also use the **Camera not found?** button to check the IP address of your computer, one of the addresses listed should be of the form 10.TE.AM.XX where TEAM is your 4 digit team number.

Setup the Camera



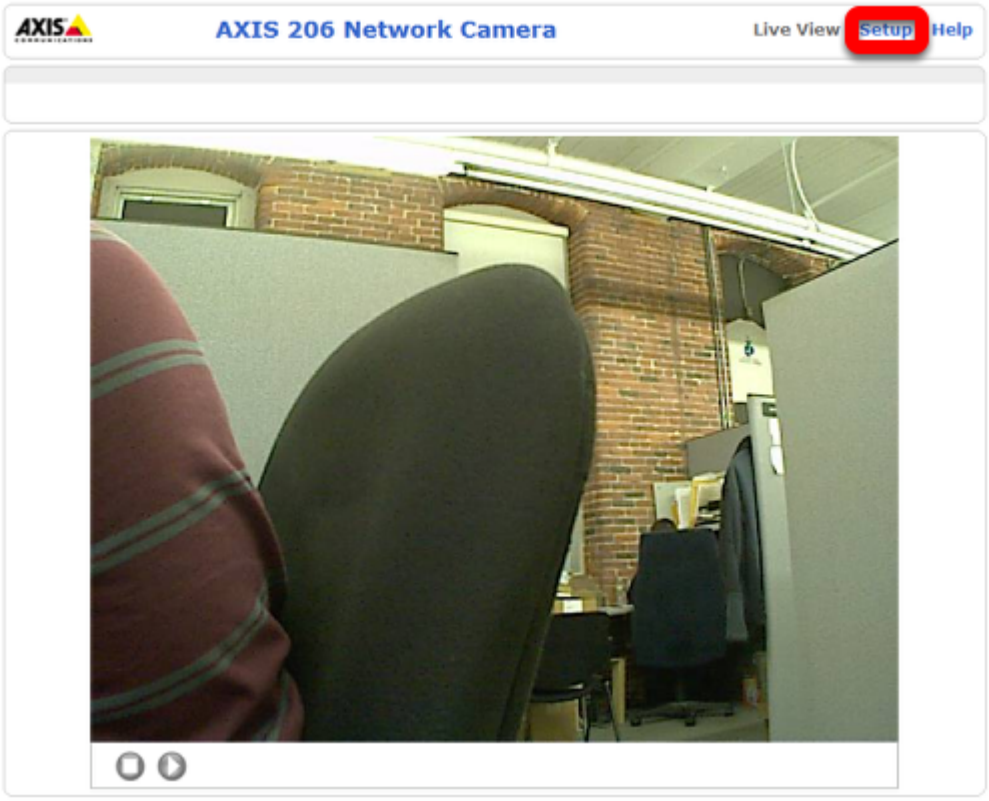
To configure the camera, press Apply.

Manual Camera Configuration



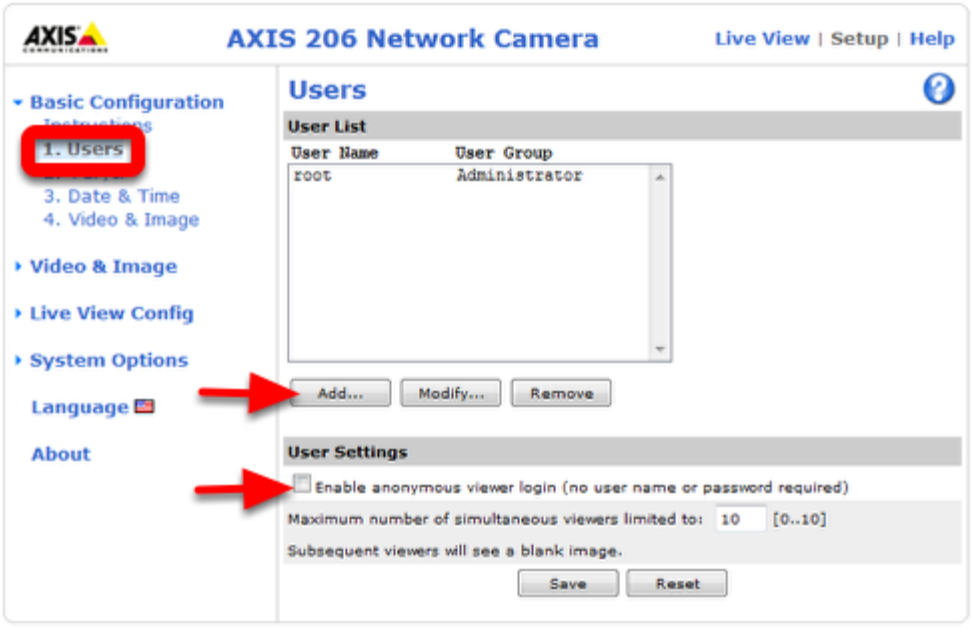
It is recommended to use the Setup Axis Camera Tool to configure the Axis Camera. If you need to configure the camera manually, follow the instructions above for connecting the camera to the computer and setting the IP, then open a web browser and enter **192.168.0.90** in the address bar and press enter. You should see a Configure Root Password page, set this password to whatever you would like, but **admin** is recommended.

Setup Page



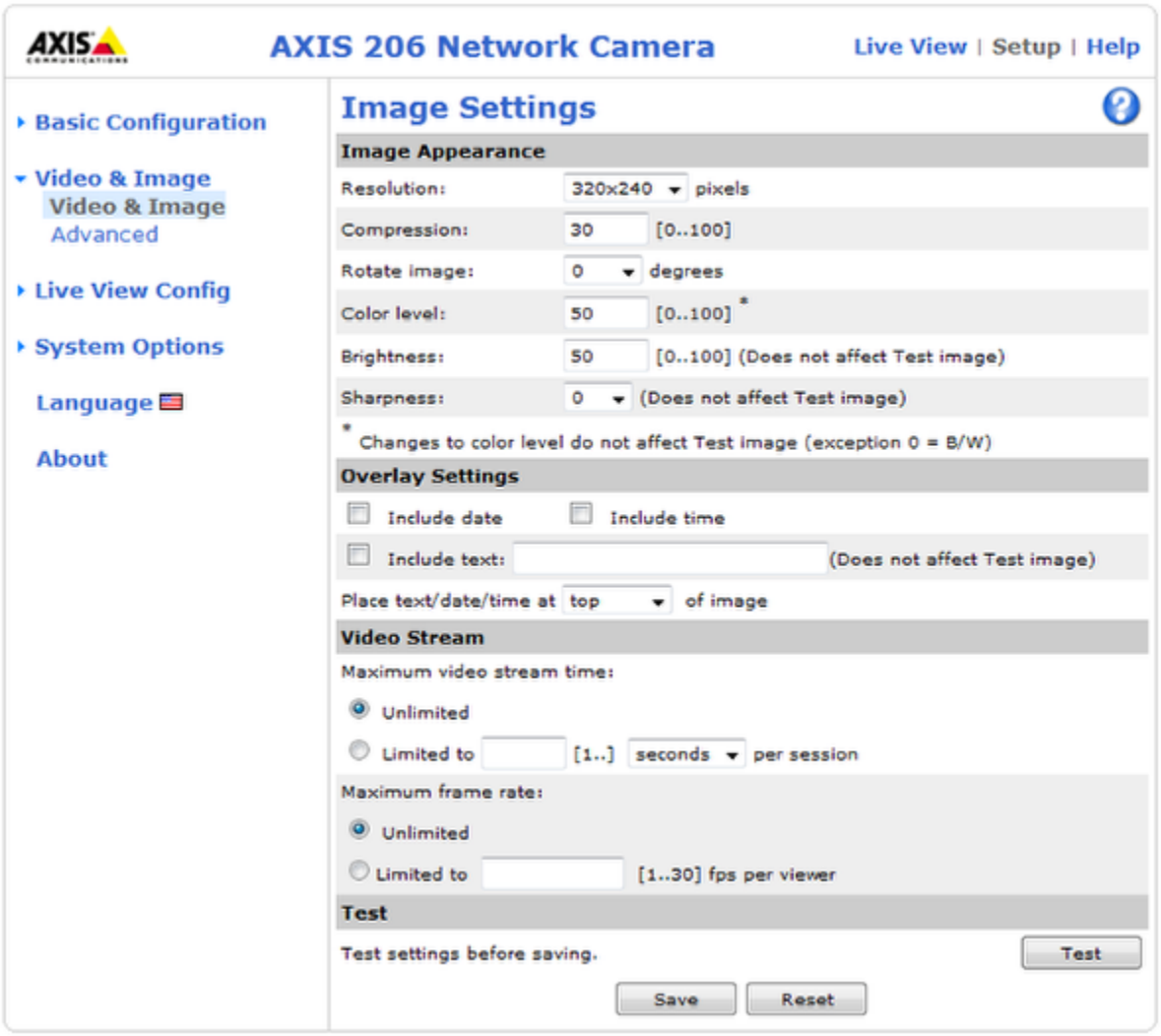
Click **Setup** to go to the setup page.

Configure Users



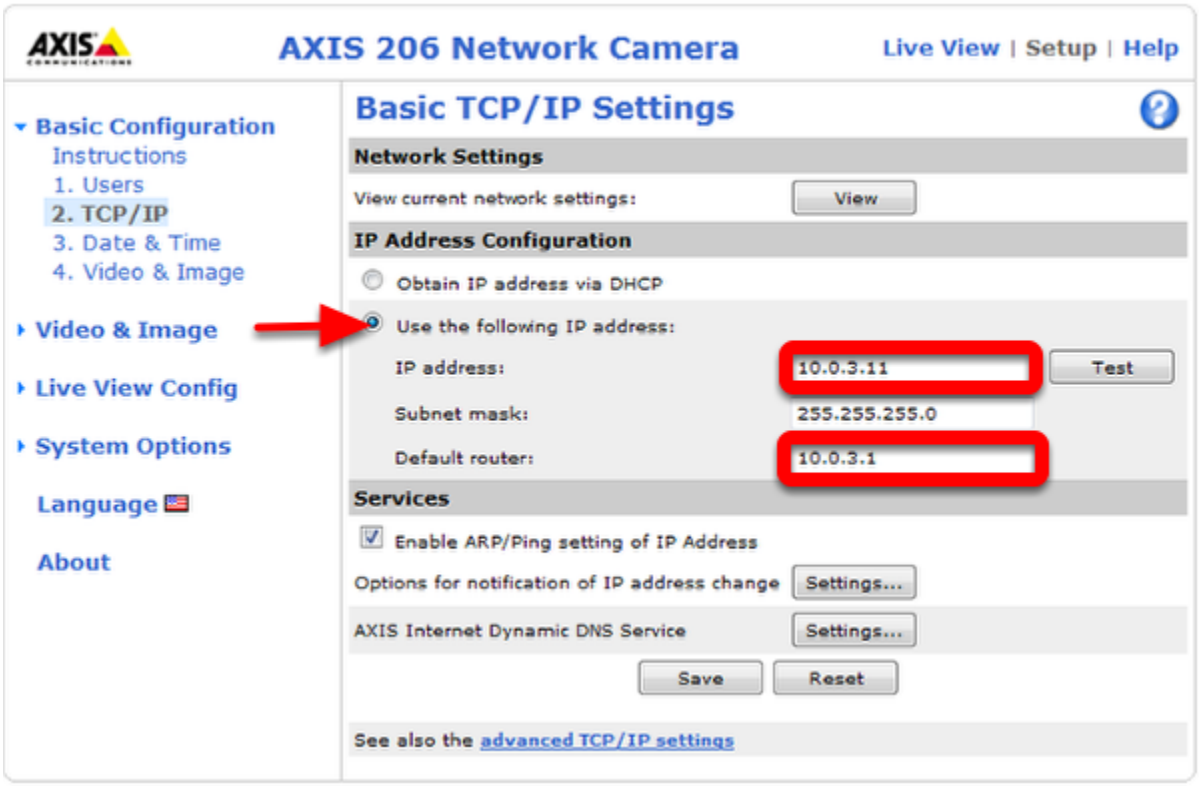
On the left side click **Users** to open the users page. Click **Add** then enter the Username **FRC** Password **FRC** and click the **Administrator** bubble, then click **OK.** If using the SmartDashboard, check the **Enable anonymous viewer login** box. Then click **Save**.

Configure Image Settings



Click **Video & Image** on the left side to open the image settings page. Set the **Resolution** and **Compression** to the desired values (recommended **320x240, 30**). To limit the framerate to under 30 FPS, select the **Limited to** bubble under **Maximum frame rate** and enter the desired rate in the box. Color, Brightness and Sharpness may also be set on this screen if desired. Click **Save** when finished.

Configure Network Settings



To connect the camera directly to the DLink DAP-1522 on the robot, the IP settings need to be changed. Click **Basic Configuration** then **TCP/IP** on the left side of the screen to go to the network configuration page. Click the bubble to **Use the following IP address,** then enter 10.xx.yy.11 in the box where xxyy is your 4-digit team number (pictured example is set for team 3). In the **Default Router** box enter 10.xx.yy.1. Click **Save**. Your Axis camera is now set up for use on the robot.

Axis M1013 Camera Compatibility

It has come to our attention that the Axis M1011 camera has been discontinued and superseded by the Axis M1013 camera. This document details any differences or issues we are aware of between the two cameras when used with WPILib and the provided sample vision programs.

Optical Differences

The Axis M1013 camera has a few major optical differences from the M1011 camera:

1. The M1013 is an adjustable focus camera. Make sure to focus your M1013 camera by turning the grey and black lens housing to make sure you have a clear image at your desired viewing distance.
2. The M1013 has a wider view angle (67 degrees) compared to the M1011 (47 degrees). This means that for a feature of a fixed size, the image of that feature will span a smaller number of pixels

Using the M1013 With WPILib

The M1013 camera has been tested with all of the available WPILib parameters and the following performance exceptions were noted:

1. The M1013 does not support the 160x120 resolution. Requesting a stream of this resolution will result in no images being returned or displayed.
2. The M1013 does not appear to work with the Color Enable parameter exposed by WPILib. Regardless of the setting of this parameter a full color image was returned.

All other WPILib camera parameters worked as expected. If any issues not noted here are discovered, please file a bug report on the WPILib tracker (note that you will need to create an account if you do not have one, but you do not need to be a member of the project).