

IP AND WIRELESS CONFIGURATION

TEAM 522 | THE ROBO WIZARDS
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PARTS OVERVIEW

- ◉ Linksys WRT610N Wireless N Router
- ◉ Linksys WGA600N Wireless Gaming Adapter
- ◉ Axis 206 Network Camera

WIRELESS N ROUTER

- ⦿ Used to connect Driver Station to robot
- ⦿ Used for wireless programming
- ⦿ Not used in competition
- ⦿ Not mounted on robot
- ⦿ Connects to port 1 on Driver Station



WIRELESS GAMING ADAPTER

- ◉ Used to connect robot to Driver Station
- ◉ Used for wireless programming
- ◉ Used in competition
- ◉ Mounted on robot
- ◉ Connects to cRIO Ethernet Port 1 using a straight-through cable
- ◉ Gets power from Power Distribution Board.



AXIS CAMERA

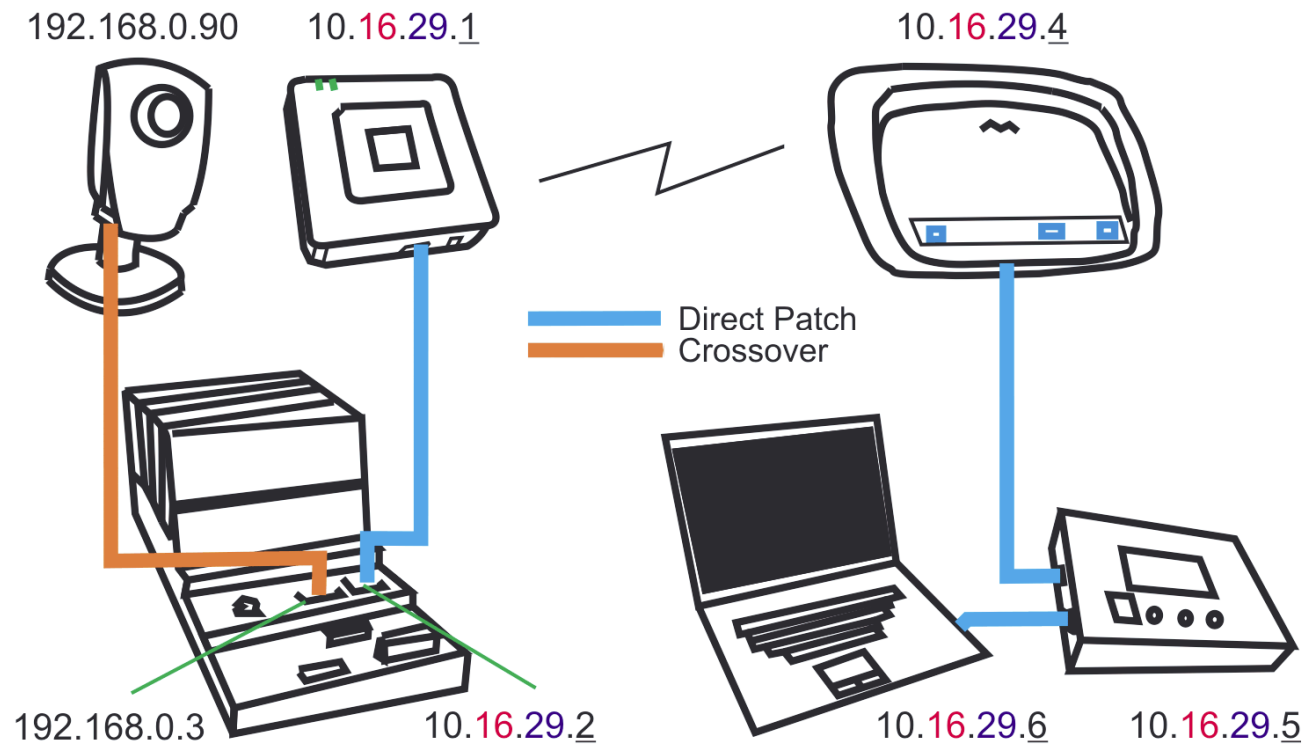
- ◉ Always connects to cRIO Ethernet Port 2 using a crossover cable (orange)
- ◉ Max frame rate is 30fps
- ◉ 5v power from WAGO connector on Power Distribution Board
- ◉ IP Address is always 192.168.0.90
- ◉ Implements with old CMUcam pan-tilt assembly



IP ADDRESSING & WIRING

TEAM 1629

IP Addressing: 10.16.29.X



2009 FRC: Example IP address allocation.

IP CONFIGURATION

Component	Default IP	Team 62	Team 522	Team 1234
Wireless Bridge		10.0.62.1	10.5.22.1	10.12.34.1
cRIO Port #1	10.0.0.2	10.0.62.2	10.5.22.2	10.12.34.2
cRIO Port #2	Not enabled	192.168.0.3	192.168.0.3	192.168.0.3
Router		10.0.62.4	10.5.22.4	10.12.34.4
Driver Station	10.0.0.5	10.0.62.5	10.5.22.5	10.12.34.5
PC	-----	10.0.62.6	10.5.22.6	10.12.34.6
Camera	192.168.0.90	192.168.0.90	192.168.0.90	192.168.0.90

Subnet Mask is 255.0.0.0

CAMERA CONFIGURATION

- ◉ Connect camera to computer via Crossover Ethernet cable
- ◉ Set your PC IP address to a static IP of 192.168.0.xx with a subnet mask of 255.255.255.0 and xx is a number from 1-255.
- ◉ Open a web browser and go to <http://192.168.0.90>
- ◉ When prompted for a username, enter "root" and the password of "pass"
- ◉ On the top right click "Setup"
- ◉ On the top left click "Users"
- ◉ Click "root" and then click "Modify"
- ◉ Enter the password "admin" twice and then click OK to save.

WIRELESS GAMING ADAPTER CONFIGURATION

- ◉ Connect your computer's Ethernet port to Driver Station Ethernet port 1 using a straight-through Ethernet cable
- ◉ Connect Driver Station Ethernet port 2 to the router Port 1 using a straight-through Ethernet cable
- ◉ Connect the Gaming Adapter to any 3 of the remaining ports on the router using a straight-through Ethernet cable
- ◉ Open a web browser and navigate to <http://192.168.1.250>
- ◉ Enter the username "admin" and password "admin"
- ◉ Click on "Basic" from the menu and then select "Wireless"
- ◉ Configure the settings to match the slide on the next screen

WIRELESS GAMING ADAPTER CONFIGURATION (CONT.)

- Click Save
- When asked to reboot now or later, choose “Reboot Now”
- Navigate back to <http://192.168.1.250>
- Select “Basic” and then “Network Settings”

Wireless

Wireless Network Settings

Use this section to configure the wireless settings for your wireless Gaming Adapter. Please note that changes made on this section may also need to be duplicated on your Wireless AP.

Wireless Network Mode Setting

Wireless Network Mode :

Wireless Network Settings

Wireless Network Name : (Also called SSID)

802.11 Band : 2.4GHz 5GHz 2.4GHz and 5GHz

802.11 Mode :

Transmission Rate : (Mbit/s)

Channel Width :

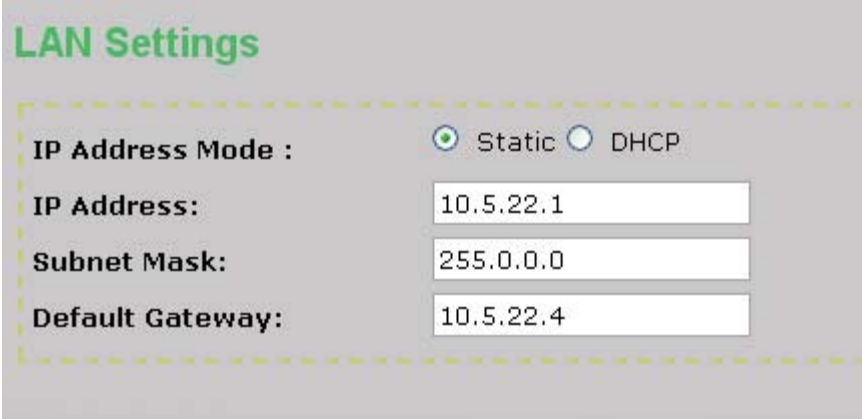
Wireless Security Mode

To protect your privacy you can configure wireless security features. This device supports WPA-Personal security mode. WPA provides a higher level of security. WPA-Personal does not require an authentication server.

Security Mode :

WIRELESS GAMING ADAPTER CONFIGURATION (CONT. 2)

- Configure the LAN settings to match your FRC Team number
- Examples: 10.0.62.1
10.5.22.1
10.12.34.1
- Click "Save Settings" and when asked to reboot now or later choose "Reboot Now"
- The page will not reload due to an IP address mismatch which will be fixed later



The screenshot shows a 'LAN Settings' configuration window. It features a title bar with the text 'LAN Settings' in green. Below the title bar, there are four rows of configuration options, each with a label on the left and a corresponding input field or control on the right. The first row is 'IP Address Mode', which has two radio buttons: 'Static' (which is selected) and 'DHCP'. The second row is 'IP Address', with a text input field containing '10.5.22.1'. The third row is 'Subnet Mask', with a text input field containing '255.0.0.0'. The fourth row is 'Default Gateway', with a text input field containing '10.5.22.4'. The entire configuration area is enclosed in a dashed yellow border.

IP Address Mode :	<input checked="" type="radio"/> Static <input type="radio"/> DHCP
IP Address:	<input type="text" value="10.5.22.1"/>
Subnet Mask:	<input type="text" value="255.0.0.0"/>
Default Gateway:	<input type="text" value="10.5.22.4"/>

WIRELESS ROUTER CONFIGURATION

- ⦿ Open your web browser and navigate to <http://192.168.1.1>
- ⦿ Leave the username space blank and enter the password “admin”
- ⦿ Click on “Wireless”
- ⦿ Change “Wi-Fi Protected Setup” to “Manual”
- ⦿ Change your settings to match the next slide

WIRELESS ROUTER CONFIGURATION (CONT.)

- ⦿ Be sure the SSID matches your Gaming Adapter's SSID. The SSID should be your team number
- ⦿ Disconnect the Ethernet cable from the router to the gaming adapter
- ⦿ Click "Save Settings"
- ⦿ The "Settings are Successful" screen should show. If the page does not reload, change the address bar to <http://192.168.1.1>

Manual Wi-Fi Protected Setup™

Network Mode:

Network Name (SSID):

Radio Band:

Wide Channel:

Standard Channel:

SSID Broadcast: Enabled Disabled

Network Mode:

Network Name (SSID):

Radio Band:

Wide Channel:

Standard Channel:

SSID Broadcast: Enabled Disabled

WIRELESS ROUTER CONFIGURATION (CONT. 2)

- Click on "Setup" and then "Basic Setup"
- Change the values to match the image on the right, but be sure to:
- Change the IP address to match your team number
- Change the subnet mask to 255.255.255.0
- Change the DHCP Start IP Address field to 10
- Click "Save Settings"
- The "Settings are Successful" page should show and click "Continue". The page will not reload due to an IP mismatch which will be fixed in the next slide

English

Automatic Configuration - DHCP

Host Name:

Domain Name:

MTU: Auto Size: 1500

IP Address: . . .

Subnet Mask:

URL Address:

DHCP Server: Enabled Disabled

Start IP Address: . . .

Maximum Number of Users:

IP Address Range: 10 . 5 . 22 . 10 to 59

Client Lease Time: minutes (0 means one day)

Static DNS 1: . . .

Static DNS 2: . . .

Static DNS 3: . . .

WINS: . . .

(GMT-08:00) Pacific Time (USA & Canada)

Automatically adjust clock for daylight saving changes.

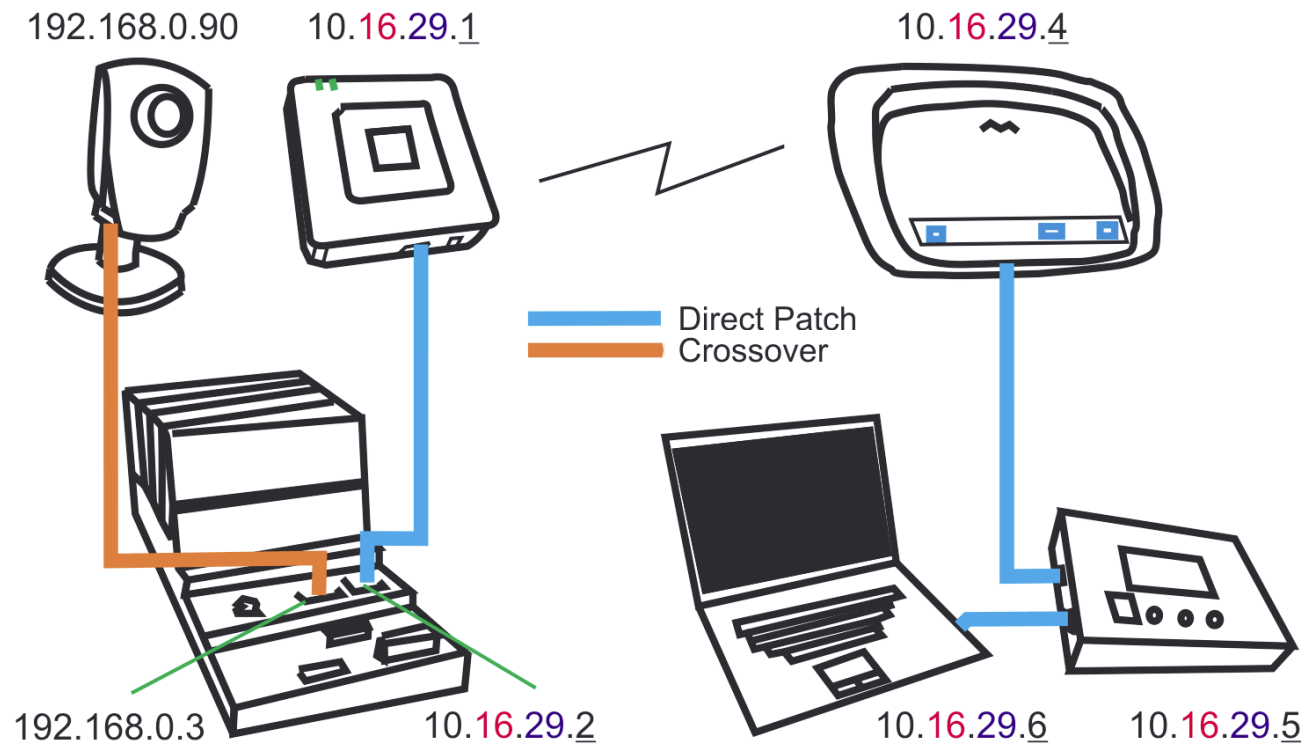
PC IP ADDRESS CONFIGURATION

- ◉ Configure your static IP address to match your team number.
- ◉ Example:
 - 10.5.22.6
 - 10.0.62.6
 - 10.12.34.6
- ◉ Enter a subnet mask of 255.0.0.0
- ◉ Enter the Default Gateway to match your team number.
- ◉ Example:
 - 10.5.22.4
 - 10.0.62.4
 - 10.12.34.4
- ◉ Open a web browser and navigate to 10.xx.yy.4 where xx and yy is your team number
- ◉ Disconnect the bridge from the router and navigate to 10.xx.yy.1
- ◉ Connect all the cables to match the diagram on the next page.

IP ADDRESSING & WIRING

TEAM 1629

IP Addressing: 10.16.29.X

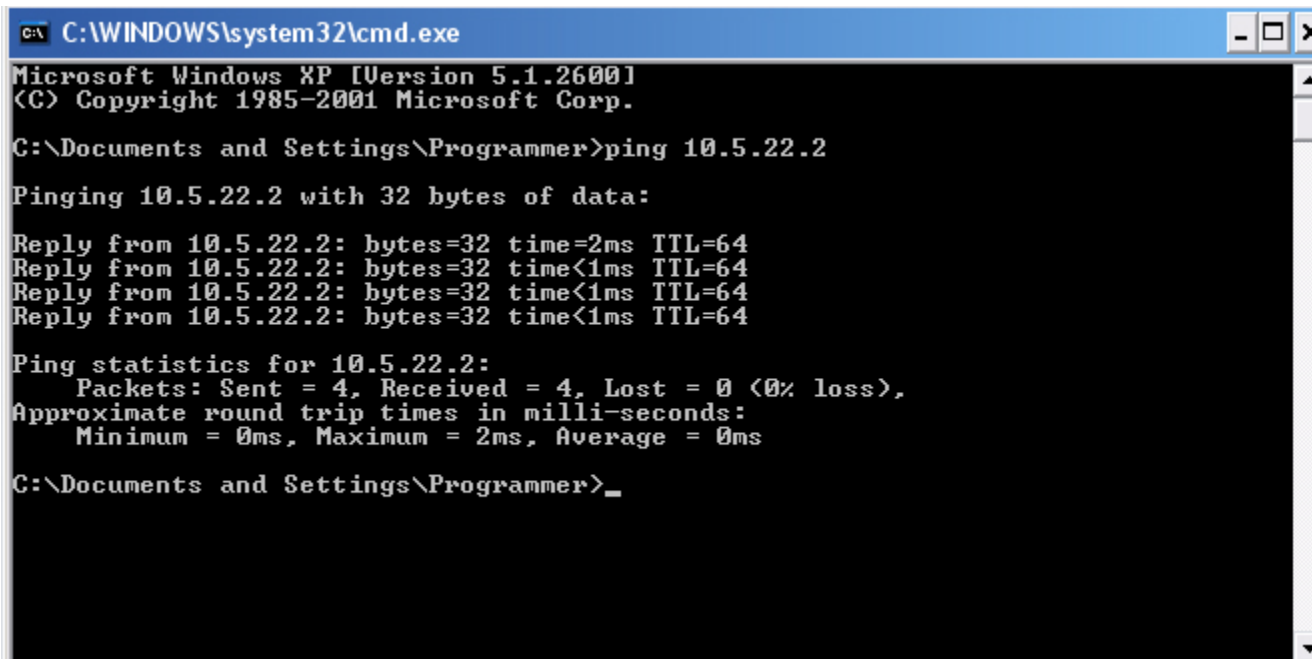


2009 FRC: Example IP address allocation.

VERIFY CONNECTIVITY

- ◉ On a windows PC, open Command Prompt
- ◉ To verify connectivity to the:
- ◉ Wireless Bridge: ping 10.xx.yy.1
- ◉ cRIO port #1: ping 10.xx.yy.2
- ◉ cRIO Port #2: ping 10.xx.yy.3
- ◉ Router: ping 10.xx.yy.4
- ◉ Driver Station: ping 10.xx.yy.5
- ◉ You should get 4 replies for every ping.

VERIFY CONNECTIVITY WITH PING



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Programmer>ping 10.5.22.2

Pinging 10.5.22.2 with 32 bytes of data:

Reply from 10.5.22.2: bytes=32 time=2ms TTL=64
Reply from 10.5.22.2: bytes=32 time<1ms TTL=64
Reply from 10.5.22.2: bytes=32 time<1ms TTL=64
Reply from 10.5.22.2: bytes=32 time<1ms TTL=64

Ping statistics for 10.5.22.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\Documents and Settings\Programmer>_
```

QUESTIONS?

- ⦿ You can download this presentation on robowizards.com
- ⦿ Good Luck and we'll see you at competition.