



iSoccerBot® System Setup Guide

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iSoccerBot® System Setup Guide

The Minimum PC requirements for running iSoccerBot system

- Pentium 2GHz processor or faster
- Windows XP with at least Service Pack 2
- At least 1GB or RAM
- At least 2GB of available space on the hard disk
- CD-ROM or DVD-ROM drive
- Keyboard and mouse
- Video adaptor and monitor with (800x600) or higher resolution Firewire card



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Camera for Computer Vision

- **BASLER A311fc - High performance camera**
- **Progressive Scan CCD**
- **High Frame Rates - 73 frames/sec**
- **Resolution: 659 x 492**
- **Lens: Tamron Lens 1:1.4 6-12mm Dia35.5**
- **Small size 40.8 x 62 x 62mm**
- **Weight: 310grams**
- **8-36VDC, low power max at 3 Watt(@12VDC)**

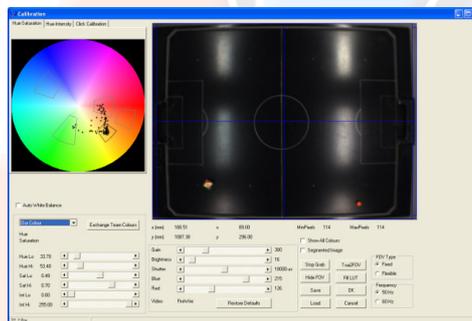


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iSoccerBot Software



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iSoccerBot Soccer Robots



ROBOT ID NUMBER

1	2	3	4	5
				



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System Installation – IEEE 1394 for color camera

1. Copy the directory CMU1394 to the C drive
2. Connect your Basler camera to firewire card
3. From the Windows Start button, select My Computer
4. Right click and select Properties. The following dialog box will be displayed:

Download driver pack at

www.inovamicro.com/isoccerbot.html





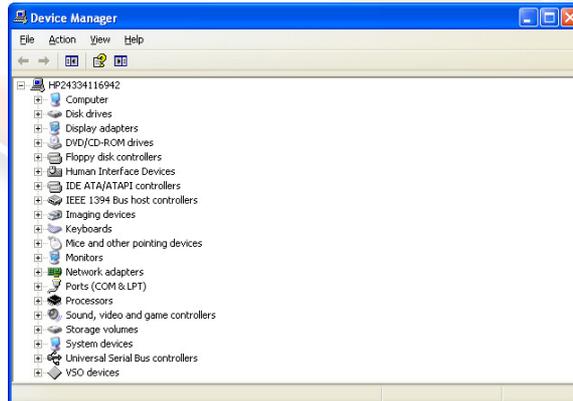
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System Installation – IEEE 1394 for color camera

5. Select the Hardware tab and press the [Device Manager] button



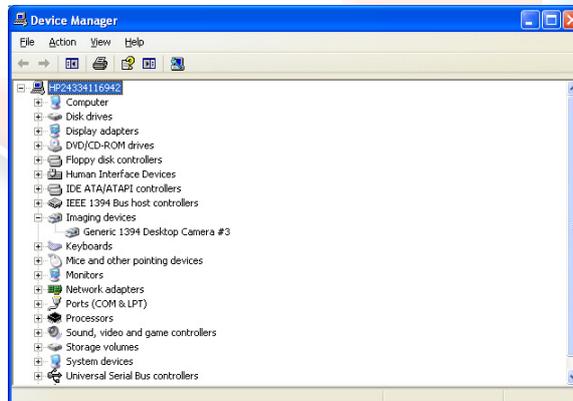
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System Installation – IEEE 1394 for color camera

6. Click on the Image devices



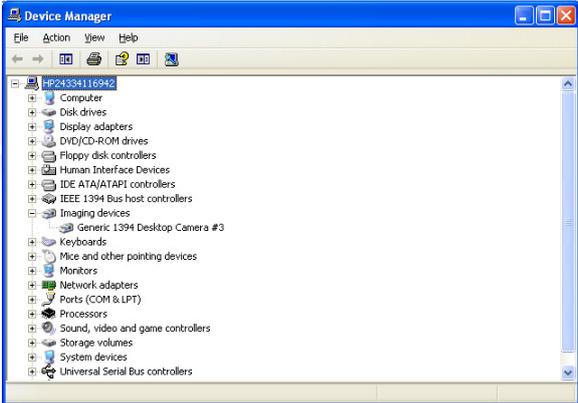
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System Installation – IEEE 1394 for color camera

7. Right Click on the Generic 1394 Desktop Camera and select Update Driver



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System Installation – IEEE 1394 for color camera

8. Select the [Install from a list or specific location (Advanced)] radio button



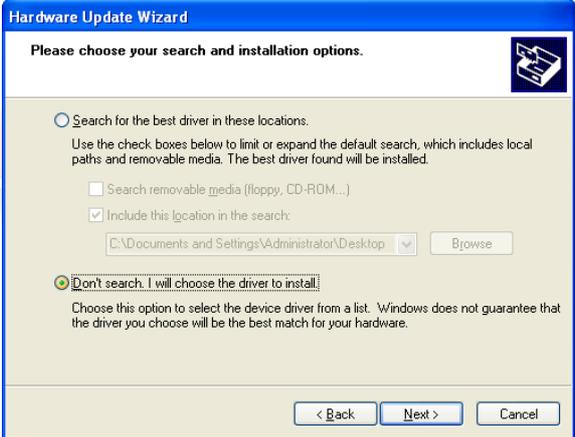
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System Installation – IEEE 1394 for color camera

9. Click on [Don't search. I will choose the driver to install] radio button





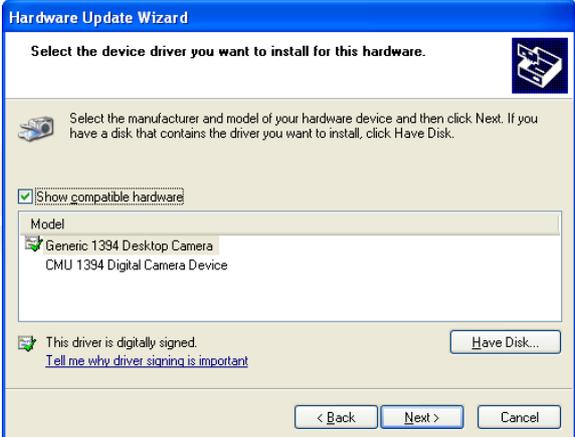
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System Installation – IEEE 1394 for color camera

10. Click the [Have Disk] button





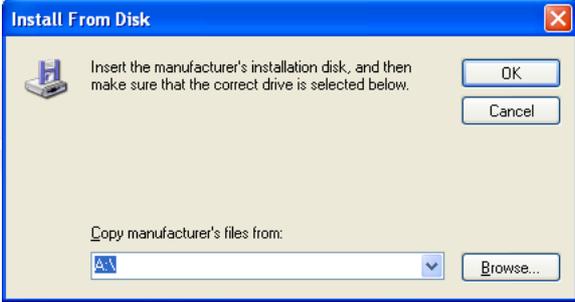
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System Installation – IEEE 1394 for color camera

11. Click the [Browse] button



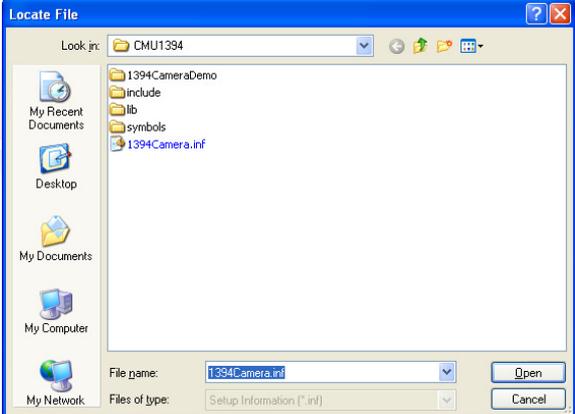


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System Installation – IEEE 1394 for color camera

12. Navigate to the CMU 1394 directory and select 1394Camera.inf file. Then click [Open] button



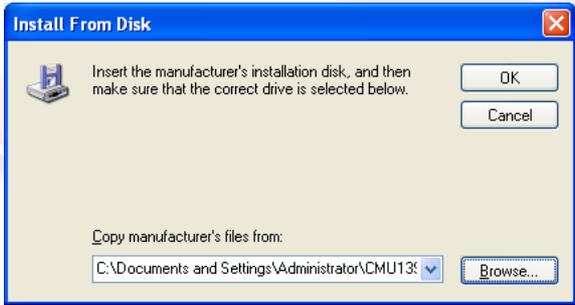


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System Installation – IEEE 1394 for color camera

13. Click [OK] button





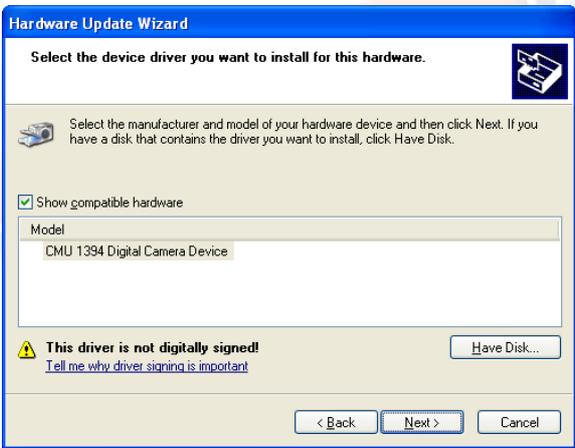
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System Installation – IEEE 1394 for color camera

14. Click [Next] button





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System Installation – IEEE 1394 for color camera

15. The following dialog box will be displayed. Click on the [Continue Anyway] button





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System Installation – IEEE 1394 for color camera

16. Finally, click on the [Finish] button. You have successfully installed the driver for acquiring images from the camera



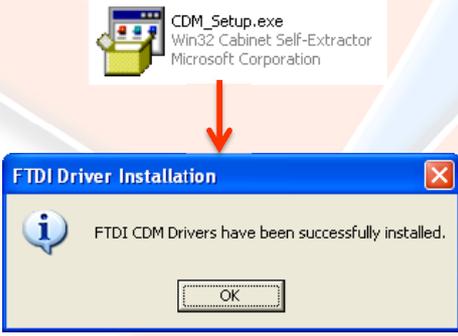


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System Installation – FTDI USB driver for wireless transmission

The FTDI driver is required so that the PC will recognize the USB port connected to the transmitter box as a COM port. Simply execute the CDM_Setup.exe file. The program should display following dialog box, indicating that it has successfully installed the FTDI driver. Click [OK] button





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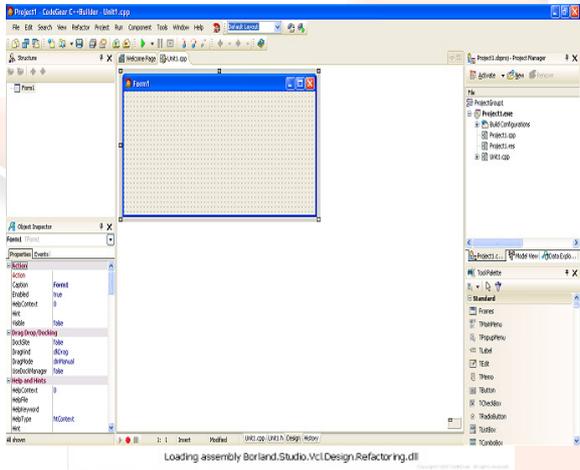
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System Installation – C++ Builder Compiler

The user is able to design and implement their own game strategy using C++. We provides the game strategy for FIRA 2011 Final as reference.

In order to compile and run the iSoccerBot program, the Embarcadero C++ Builder XE compiler is required

<http://www.embarcadero.com/products/cbuilder>





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Driver Installation – HASP Hardlock

iSoccerBot vision and motion toolkit library require HASP USB hard lock to be present to run. The Hasp driver need to be installed

- Under the folder HASP, run the installation program HASPUserSetup.exe



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Driver Installation – HASP Hardlock

- Click on the [I accept the licence agreement] radio button and press the [Next] button



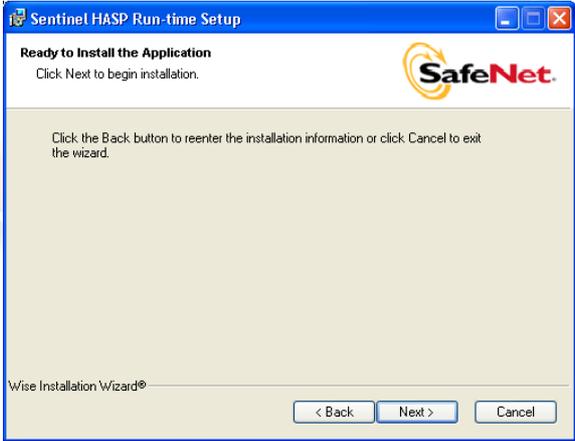
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Driver Installation – HASP Hardlock

3. Click the [Next] button to begin installation



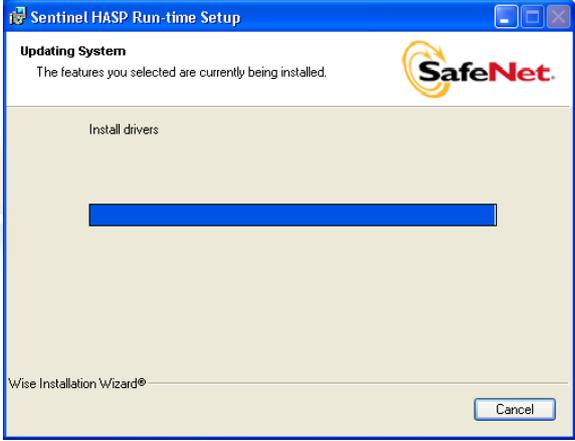


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Driver Installation – HASP Hardlock

4. The setup program will display the following dialog to show the progress of the installation



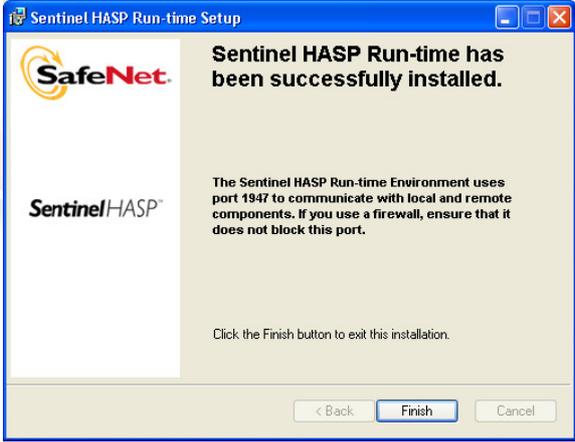


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Driver Installation – HASP Hardlock

5. The following dialog will be display when the Sentinel HASP Run-time has been successfully installed



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System Setup – Setting up the camera



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System Setup – Setting up the camera

1. Run the iSoccerBot program, Click [Color and FOV] button

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73.68 fps

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System Setup – Setting up the camera

2. Click [Color and FOV] button

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73.7 fps

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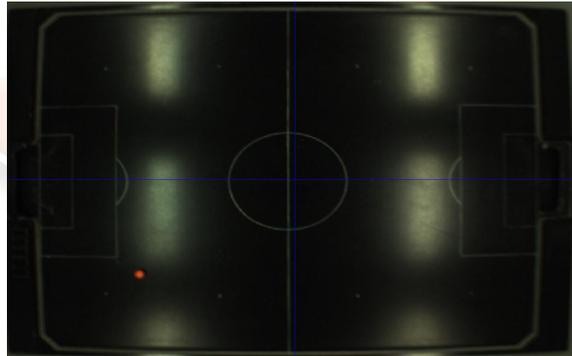
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System Setup – Setting up the camera

3. Click [Start Grab] button to start acquiring images from the camera. Click on the[F5] button to give a full-screen display of the image.



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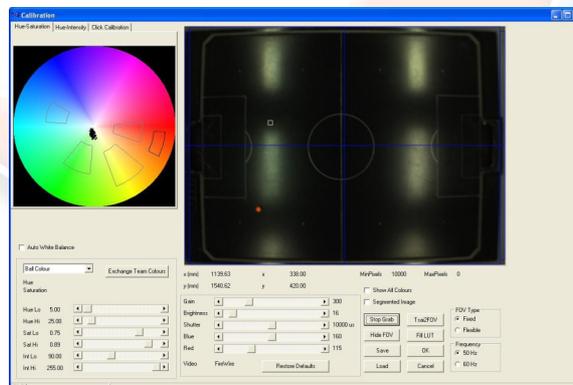
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System Setup – Setting up the camera

4. White-Balancing

place a piece of gray patch in the soccer pitch. Drag the small white square on the screen to the gray patch and click on the [Auto White Balance] check box.



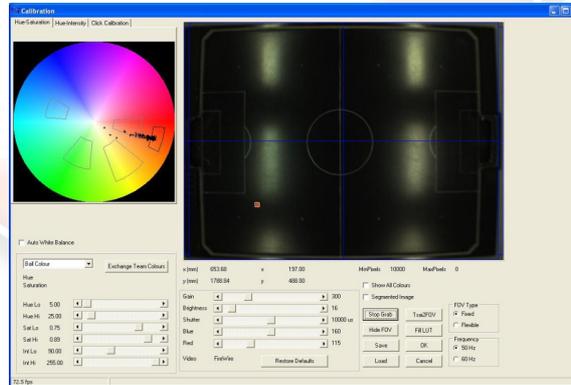
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System Setup – Calibration of Ball Color

1. Put the ball on the soccer pitch. Drag the square on the image to the ball



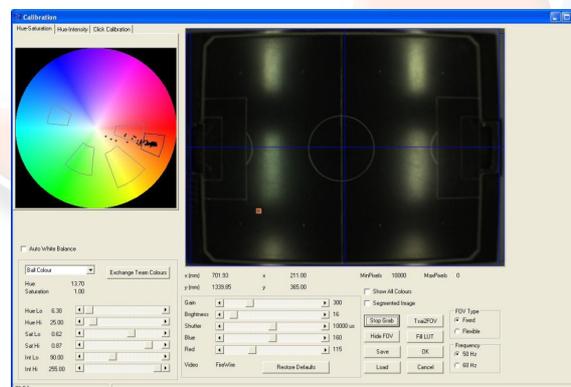
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System Setup – Calibration of Ball Color

2. The color of the pixels on the ball are indicated on the HIS chart on the top-left of the dialog box as little black crosses. To learn the ball color, drag the black boundary to encircle the little black crosses



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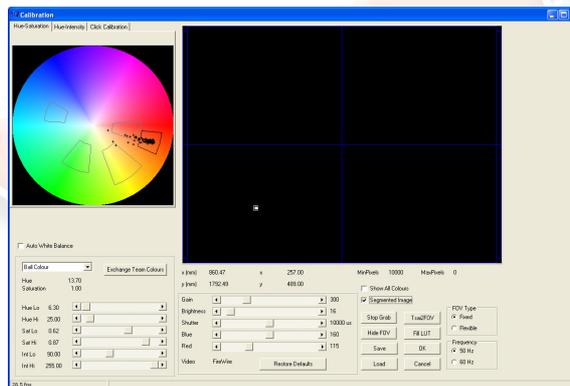
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System Setup – Calibration of Ball Color

- Click on the [Segmented Image] check box. The image displayed is a binary image. The white pixels are all pixels having their HIS values within the limits that you have set.



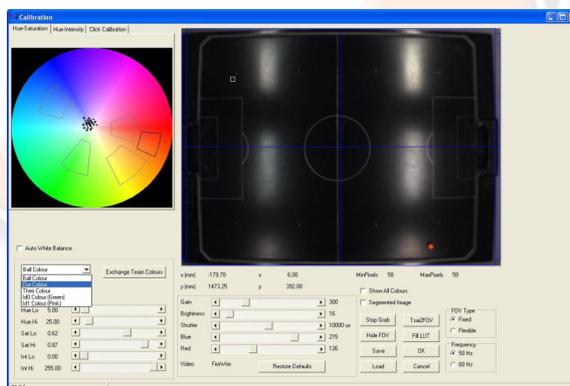
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System Setup – Calibration of Our Team Color for the soccer robot

- Select [Our Color] from the combo-box



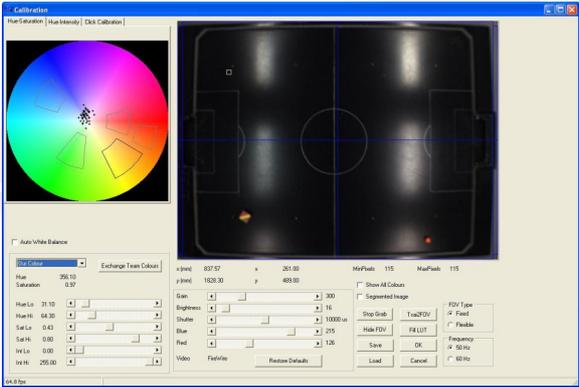
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System Setup – Calibration of Our Team Color

2. Place Team Color Patches on the soccer pitch



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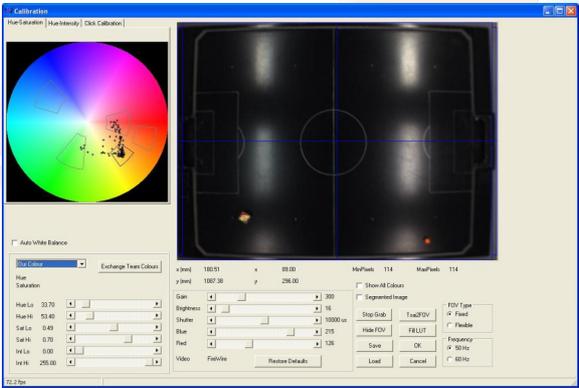
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System Setup – Calibration of Our Team Color

3. Drag the white rectangle in the image area to your team color. Let us assume that you are using the yellow team color. Adjust the HIS limits for the yellow color.



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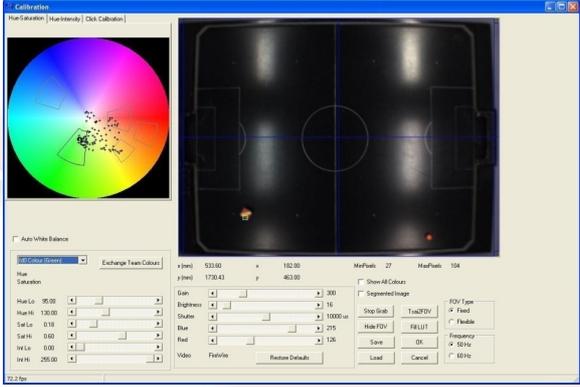
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System Setup – Calibration of Opponent Team Color

4. This step is to grab the Green Team ID Color. Select [Id0 Color (Green)] from the combo-box



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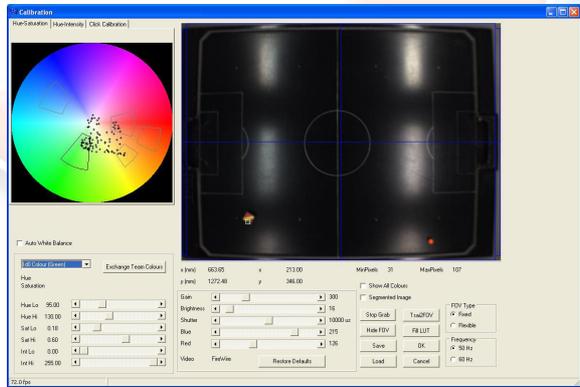
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System Setup – Calibration of Our Team Color

5. Drag the white rectangle in the image area to your team green id color. Adjust the HSI limits for the green color



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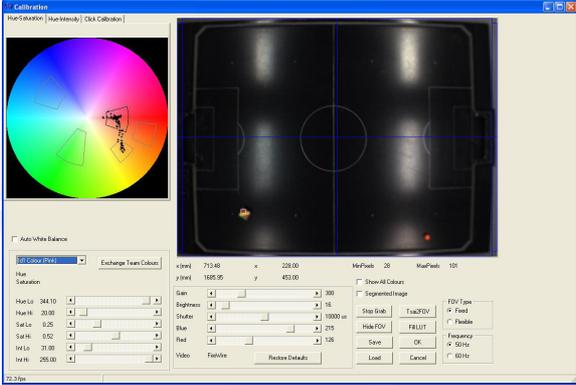
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System Setup – Calibration of Our Team ID Color

6. This step is to grab the Pink Team ID Color. Select [Id1 Color (Pink)] from the combo-box



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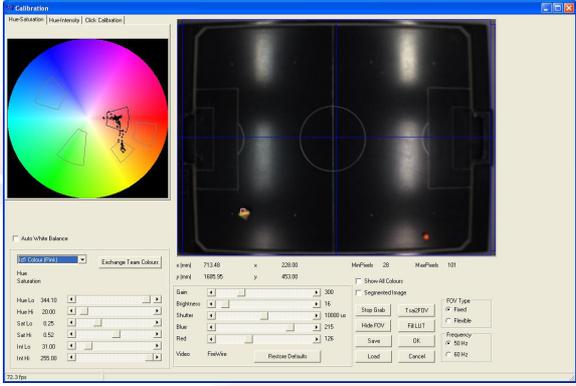
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System Setup – Calibration of Our Team ID Color

7. Drag the white rectangle in the image area to your team pink id color. Adjust the HIS limits for the pink color



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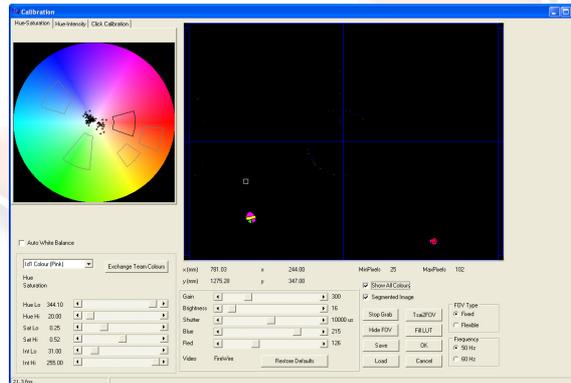
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System Setup – Calibration of Our Team ID Color

- To confirm that all colors have been trained properly, click on the [Show All Colors] and [Segmented Image] check boxes



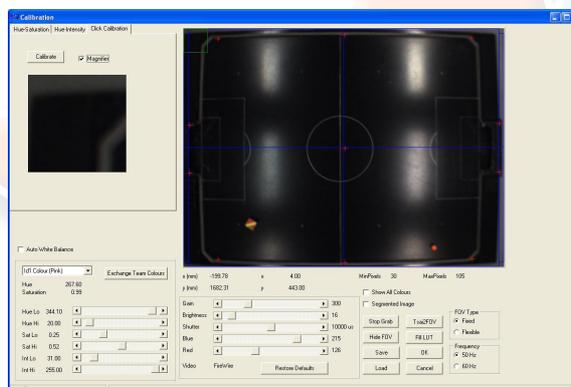
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System Setup – Calibration of Coordinates

- Select the [Click Calibration] tab. Check the [Magnifier] checkbox. The square sub-image is the magnified version of the image in the green square



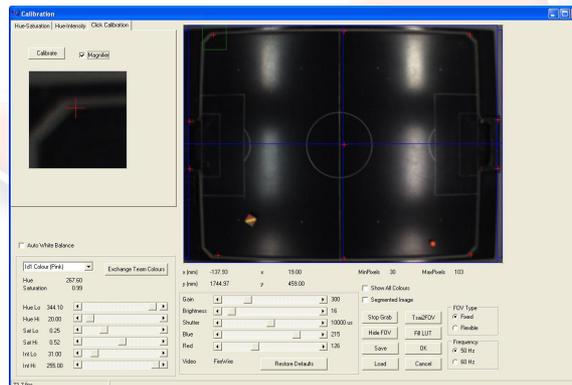
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iSoccerBot® System Setup Guide

System Setup – Calibration of Coordinates

2. First drag the green square to the top corner of the soccer pitch. In the magnified image, drag the cross to the inner corner of the pitch. Repeat 10 times as illustrated then press [Calibrate] button. To save press [Save] button.



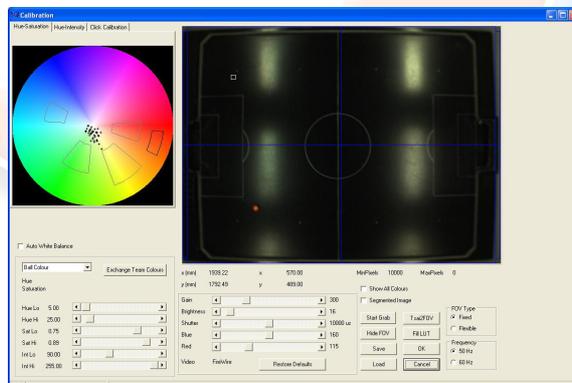
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iSoccerBot® System Setup Guide

System Setup – Exit Calibration Page

9. Press the [OK] Button to return to the main application window



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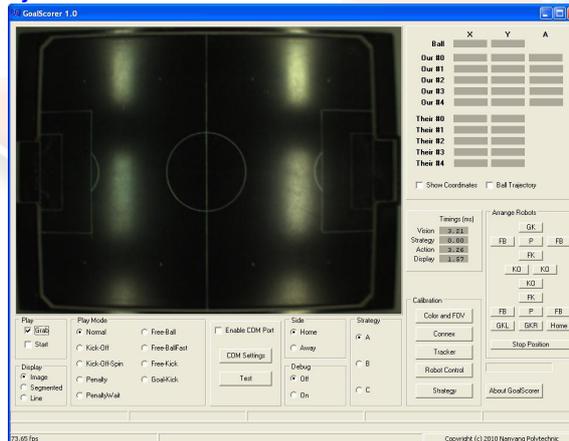
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Running a Game

1. Under the main application window, press the [Grab] checkbox. The application will grab images continuously



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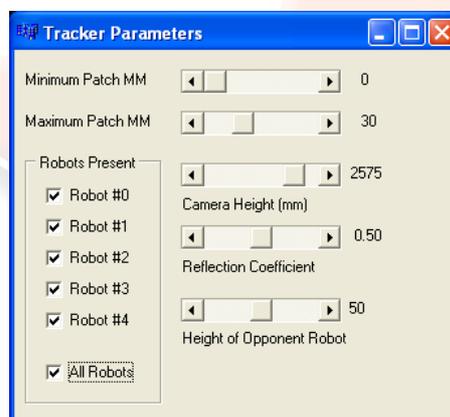
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Tracking the Robots

1. Press the [Tracker] button. Click the [All robots] check box. Close the dialog box and return to the main application window.



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Tracking the Robots

1. Place the robots and ball on the field. The main application window should look like the following.



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Tracking the Robots

1. Notice that the robots are labeled with their robot numbers. You can also choose to display the segmented image or the line drawing image by selecting the respective radio buttons.



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SoccerBot iSoccerBot® System Setup Guide

Robot Test Run

1. In the main application window, select the [Enable COM Port] check box.



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SoccerBot iSoccerBot® System Setup Guide

Robot Test Run

1. Make sure the robots are switched on. Press the [Test] button. If the transmission is set up correctly, the robots will rotate a quarter turn and return to its original position



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iSoccerBot® System Setup Guide

Arrangement of robots

1. The buttons in the red box as shown in the following diagram of the main application window is for the positioning of robots





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iSoccerBot® System Setup Guide

Arrangement of robots

<p>GK</p> <p>FB</p> <p>FK</p> <p>P</p> <p>KO</p> <p>GKL</p> <p>GKR</p> <p>Home</p> <p>Stop Position</p>	<p>Goal-Kick</p> <p>Free-Ball</p> <p>Free-Kick</p> <p>Penalty</p> <p>Kick-Off</p> <p>Goal-Kick Left</p> <p>Goal-Kick Right</p> <p>Bring all robots to home position</p> <p>Press this button to abort any position action</p>
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The preset positions of all the robots for each of the settings can be changed in the [getRobotPlacement] function in the strategy.cpp file



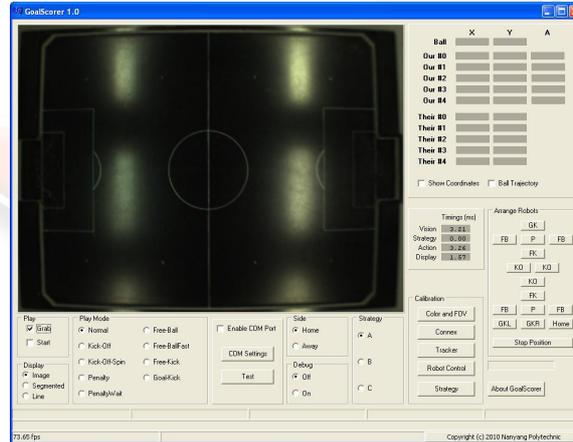
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1. To start play, check the [Start] checkbox. To stop play, uncheck the [Start] checkbox.
2. Note that the system will not run if the valid hardware lock is not present
3. You can now enjoy the game and start writing you own code for strategy!



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