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TECHNICAL SPECIFICATION
ASSEMBLY MANUAL

Photo finish set
ZFFC

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PRODUCT SUPPORT
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I. General description

ZFFC competition photo finish set is the complete system which lets you conduct all track events in the athletics. The main element of the system is a professional photo finish camera with timing feature and colour module. The camera takes pictures with the speed of 2000 frames/s. Special computer software assembles the pictures to form images of the finish line with competitors crossing it and their times, so it is easy for the operator to read the competitors' times.

II. Parts list

The set includes:

Part code	Image	Description	Q-ty
5L500	 +  +  + 	photo finish digital camera LYNX Vision with motorized lenses 8-48 mm f1.2, digital junction box and wiring, carrying case	1 set

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Part code	Image	Description	Q-ty
STM		tripod	1 pc
GST		tripod head	1 pc
CB	 	capture button with USB to serial converter	1 pc
CS-NC		start sensor normally closed NC	1 pc

Part code	Image	Description	Q-ty
RS-START9		starting revolver with impulse wire	1 pc
PNB-150		start signal cable 150 m on spool lets you connect the revolver to the junction box	1 pc
ODZ		athletics competition management software	1 pc
KL		laptop	1 pc
DL		laser printer	1 pc

Items not included

Plumb bob and string. The plumb bob is available at your local hardware store, and you can use virtually any type of string or twine, as long as it is at least the width of your track.

III. Quick Start Guide

Step 1: Install the software

Install using the Lynx Resource CD or download the latest version of FinishLynx at: **www.finishlynx.com/product/software/finishlynxresults-software/**
Follow the instructions on your screen to install FinishLynx. When prompted, enter the serial numbers found on the back of your CD case.
1) Start FinishLynx by clicking the Windows **Start** button and selecting **All Programs** | **FinishLynx**.

Step 2: Configure the network for Windows OS prior to Windows 7 *(See Step 3: below for Windows 7,8 and higher)*

1. Click the Microsoft Windows **Start** button and select **Control Panel**, *or* click **Start** | **Settings** | **Control Panel**.
2. Double-click **Network Connections**.
3. Right-click the **Local Area Connection** associated with the network interface card (NIC) in use and select **Properties**. The **Local Area Connection Properties** dialog appears.
4. Make sure you see a line that reads, **Internet Protocol (TCP/IP)**. You may have to scroll down to see it.
a. Click **Install** and select **Protocol**.
b. Click **Add....**
c. Click to select the **Microsoft TCP/IP** option and then click **OK**.
5. Check the box next to **Internet Protocol (TCP/IP)**.
6. Click to select **Internet Protocol (TCP/IP)** and then click **Properties**. The **Internet Protocol (TCP/IP) Properties** dialog appears.
7. Click the **Use the following IP Address:** button and then type the following numbers:
_ IP address: **192.168.0.5**
_ Subnet mask: **255.255.255.0.** Click **Ok** and then click **Ok** again.
8. If you are running Windows XP, follow these steps to disable the firewall. Otherwise continue to Step 4:
a. Open the Windows **Network & Sharing Center**.
b. Right-click the **Local Area Connection** associated with your system, and select **Properties**. The Local Area Connection dialog appears.
c. Click the **Advanced** tab.
d. Make sure the box **under Internet Connection Firewall** is *unchecked*.
e. Click **Ok** and then exit the Network Connections screen.
Restart your computer.

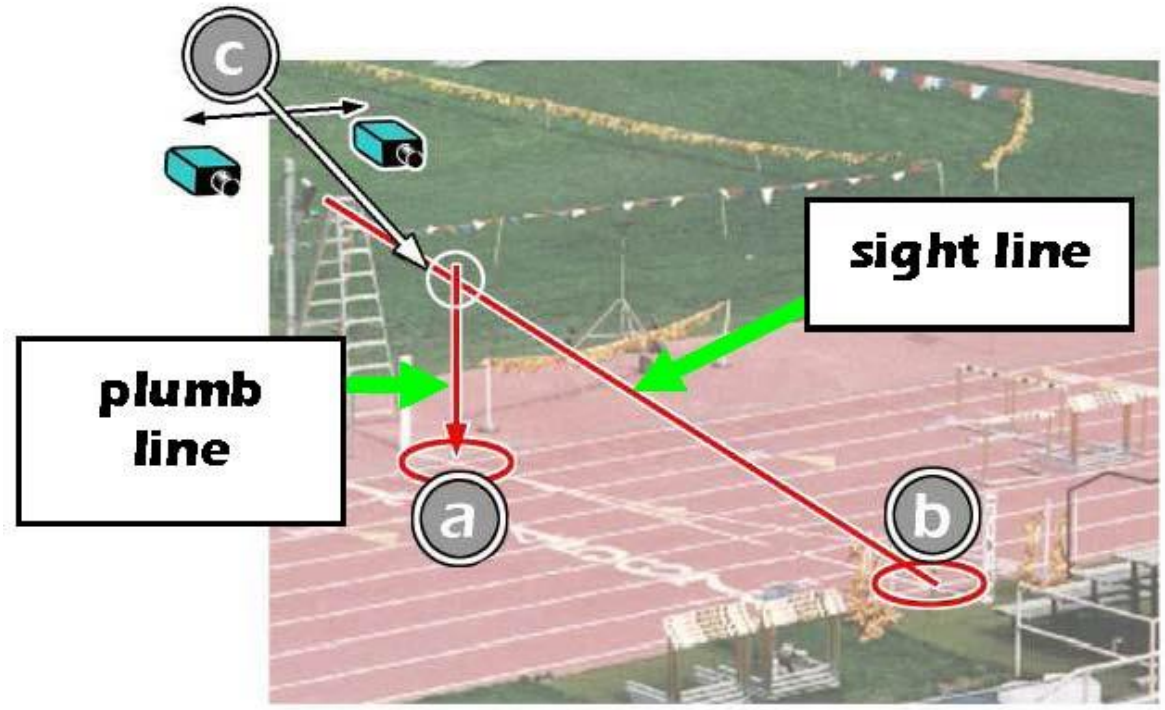
Step 3: Configure the network for Windows 7 & 8 *(if applicable)*

1. Go to the windows **Control Panel**. On the top right is **View By** with a drop down arrow. Click the drop down arrow and

choose Small or Large Icons.
2. Find and double click on **Network and Sharing Center**. They are listed alphabetically by icon name.
3. This will open the **Network and Sharing Center**. On the left is a blue section titled Control Panel Home.
4. Click on the **Change Adapter Settings** icon.
5. A new window will open displaying your network connections. Right click on the **Wireless Network Connection** and select **Disable** from the list of items. This is only necessary for the FinishLynx Capture computer.
6. Right click on the **Local Area Connection** and select **Properties** from the list of items. A new window will appear with a list of connection items. Click to select **Internet Protocol Version 4 (TCP/IPv4)** and click the **Properties** button.
7. A Properties window will appear and is typically set to **Obtain an IP address automatically**. Click to select the radio button for **Use the following IP address**. In the box for IP address, enter 192.168.0.5 for FinishLynx and hit **Tab** key to auto fill in Subnet mask 255.255.255.0
8. Click OK and navigate back to the Control Panel. In the control panel click on the Windows Firewall icon. Under Control Panel Home, on the left, click on **Turn Windows Firewall on or off**.
9. Turn off both Home and Public Firewalls (Domain for Windows Pro).

Step 4: Set up the camera and tripod

Setup the tripod in line with the finish line, preferably on the infield and approximately **10 feet back**. **Note**: Minimum recommended camera distance from track is 8 feet (at this distance you may not be able to see the feet of the athlete in Lane 1 – being able to see the feet is not a requirement for accurate timing on the Torso of the athlete). If you need to be closer than this you may have to use the optional 6mm lens.
1. Extend the tripod legs so the geared head is approximately 7 ft high.
2. On the near side of the finish line, hold a plumb bob so that it is suspended directly above the middle of the finish line. This is the **plumb line**, shown as **a** in the image below.
3. Tie string to the screw on the top of the tripod head. Have your assistant take the other end of the string to the far side of the finish line and hold the string taught. This is the **sight line**, shown as **b** in the image below.
4. Move the tripod to the left or right until the plumb line and sight line touch at position **C** in the image below. The tripod is now in the plane of the finish line.



Step 5: Attach the camera to the tripod

1. If using the optional remote positioner, secure it to the camera bottom by turning the black handled thumbscrew. Make sure the FinishLynx label faces in the same direction as the camera lens will face.

Note: Cables omitted for clarity and actual lens may vary from model shown

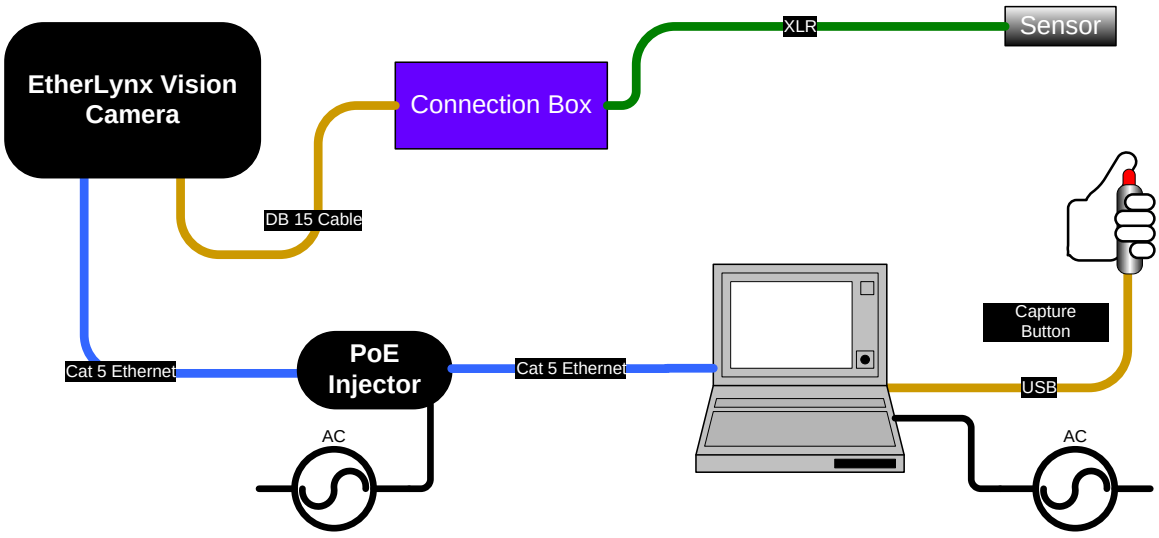
2. Connect the cable that comes with the remote positioner to the port on the positioner and the port on the back of the camera labeled **Remote.**

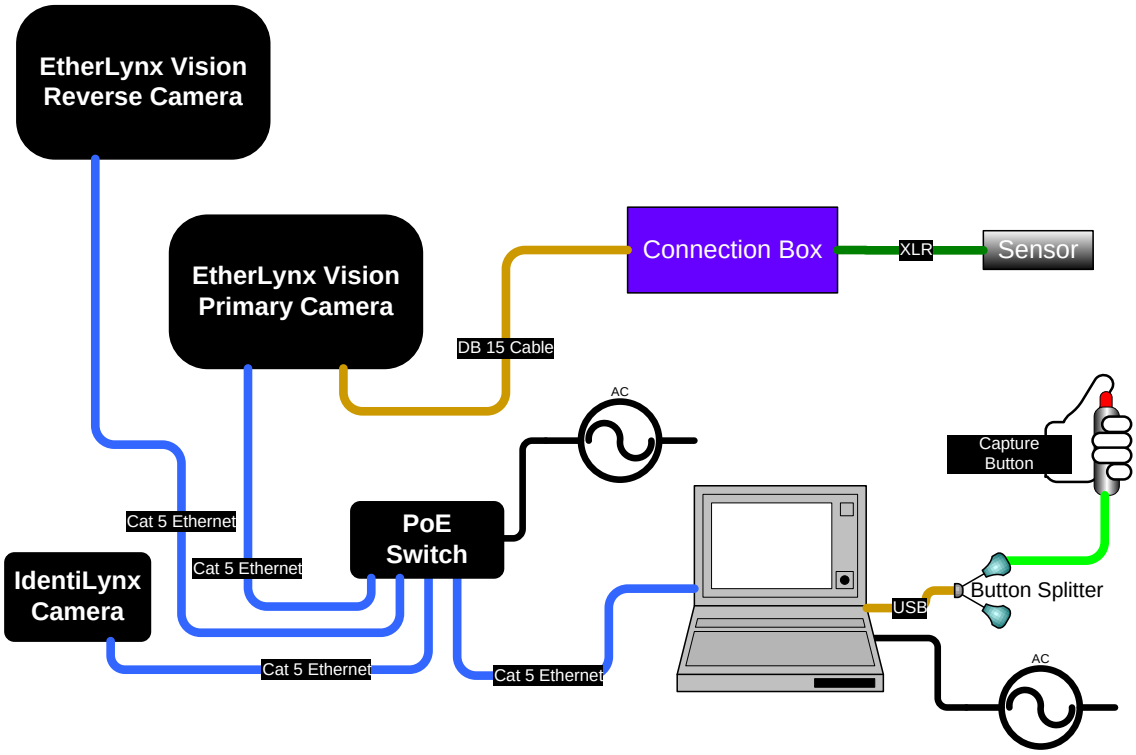
3. Connect the cable on the remote lens to the remaining serial port on the remote positioner.

4. Secure the geared head to the top of the tripod.
5. Note how the mounting plate is attached to the top of the geared head. Then, pull back on the lever at the top of the geared head to release the mounting plate.
6. Tighten the mounting plate to the bottom of the remote positioner by turning the screw with a flathead screwdriver. Make sure the **Lens** marking on the bottom of the plate is facing the front of the remote positioner (where the Lynx label is affixed).
7. Attach the camera with the remote positioner and mounting plate to the tripod by clicking the mounting plate into place on the geared head.
8. With the camera lens lined up with and facing the finish line, make minor adjustments to the tripod legs so both bubbles on the tripod are centered.
9. Turn the black knob on the geared head that controls the **tilt** of the camera so that it is at about a 30 degree angle to the ground.

Step 6: Connect the cables

Note: Alternate configurations shown below.





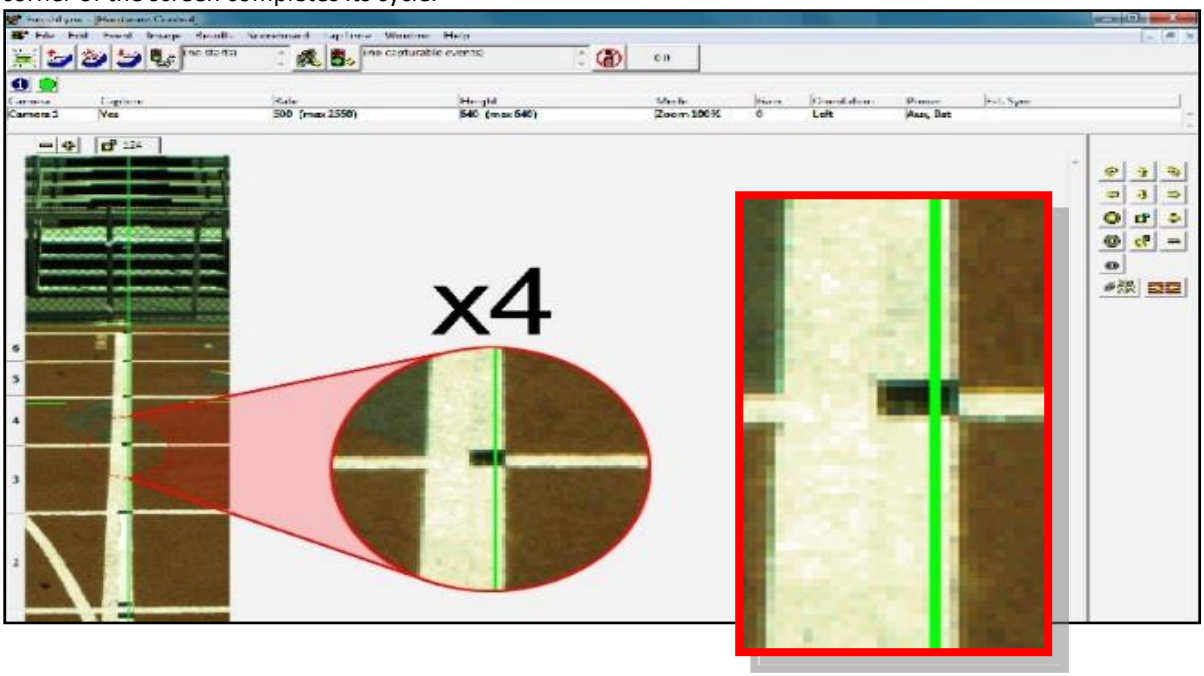
1. Connect the female end of connection box cable to the port on the back of the camera labeled ***Connection Box*** and the male end to the left side of the connection box.
2. Connect an Ethernet cable between the back of the camera labeled ***POE 10/100/1000*** to the port labelled ***Out*** on the Power over Ethernet injector.
3. Connect an Ethernet cable to the network connection on your computer and the other end to a port labelled ***In*** on the Power over Ethernet injector.
4. Connect the male end of the start sensor cable to the connection box where it says ***Start***. Attach the start sensor to

the other end of the cable and keep the start sensor close by.
5. Turn on the camera by pressing and holding the black power button on the back.

Step 7: Align the EtherLynx camera

Note: The EtherLynx Vision camera can be aligned using either 1-D mode or 2-D EasyAlign mode. We recommend using EasyAlign. If you are using an older model EtherLynx camera, however, it must be aligned using classic 1-D mode.
NOTE If running a wireless Ethernet card on your computer, we recommend that you disable it while the camera is booting.

Start FinishLynx. Wait while the green status bar in the lower right corner of the screen completes its cycle.



Align Vision Camera in EasyAlign 2-D Video Mode

1. **Activate EasyAlign** by clicking on the 2D align Icon  in the top left hand corner of the FinishLynx **Hardware Control** screen.
FinishLynx Quick Start Guide – for Vision cameras Page 4

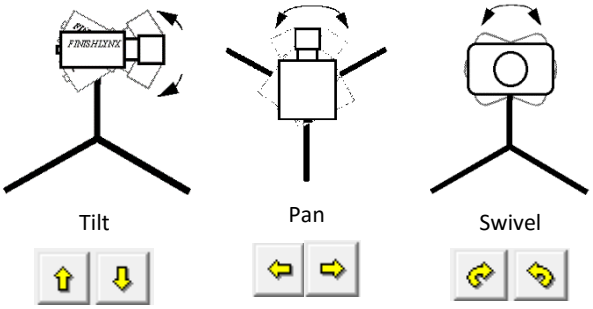
The icon turns green  and the 2-D video viewer appears within the software. The 2-D viewer makes it easy to see how your camera is aligned on the finish**. The goal is to align the green vertical line with the painted finish line and near its front edge.**
2. **Adjust Remote Lens/Positioner Controls -** Adjust the remote lens/position controls on the right of the FinishLynx hardware control screen.
Center Remote Camera Positioner

Click  to center the camera automatically using the

remote positioner.

Remote Camera Tilt, Pan & Swivel

Use the remote **Tilt, Pan**, and **Swivel** buttons to adjust the orientation of the camera on the finish. You want to ensure that the green vertical line is perfectly aligned on the white finish line and that all lanes are visible in the viewer.



Have your assistant run through the finish line and watch where he/she appears on the computer monitor. The goal is for the runner's torso to be fully visible in both the inside and outside lanes. Once the camera' position is correct, you can then optimize the remote lens settings.

Remote Iris (adjusts amount of light in lens) 

Open or Close the remote iris to bring the ACM value as close to 1 as you can by clicking and holding the remote Iris buttons.

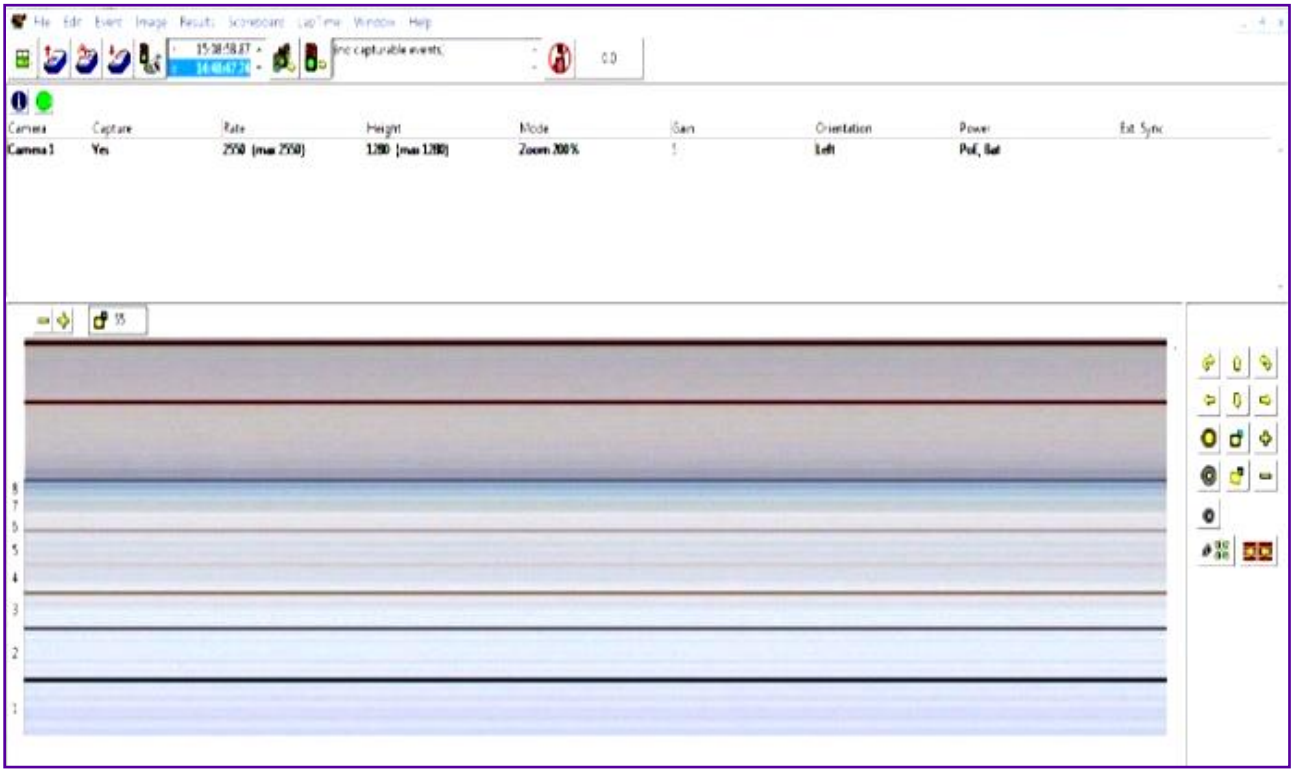
Remote Focus (adjusts near/far image focus)

Click and hold the  and  buttons on the keypad on the right of the FinishLynx screen until the image becomes crisp. Start by focusing on the far lane and adjust until all lanes are in focus. Ensure that athletes in all lanes (near and far) are in focus.

Note: If you are having a hard time getting crisp focus, try opening your lens iris and allowing the AGC to drop closer to zero.

3. Once the camera appears to be aligned, **Click**, the green alignment  icon to close 2D alignment and then click on the red 1-D alignment icon  . You will know when your camera is aligned on the finish line because the 1-D image will be primarily white. See image below for proper 1-D alignment.

4. If you followed the steps closely in 2-D align, the camera should already be aligned in 1-D mode as well. The 1-D image should look similar to the following screen capture:



Step 8: Adjust FinishLynx camera settings

1. Click **Camera Settings Icon** to open the Camera Settings dialog.
2. Click to select the **Setup** tab:
a. **Name**: enter a name to identify the camera(s)
b. **Image Orientation**: select the correct orientation for finish (infield would be Left orientation)
c. **Identify By**: select Lane for track competition
d. **Lanes**: enter the number of lanes on the track; the remaining should be left as default.
3. Click to select the **Parameters** tab
a. **Rate**: type a value in the field between 800-1000 for sprints (400m and under) or type 600-800 for distance events. Change this value when moving between sprints and distance races, or else the competitors in your FinishLynx image appear distorted.
Note: Image distortion does not affect timing accuracy.
b. **Frame Height**: will vary by camera models, 640 is recommended for most track competitions;
c. **Gain Method**: set to **AGC** for outdoor light and set up. Set **Brightness** to 70. Use **Manual** when needed.
4. Click to select the **Inputs** tab:
a. **Start Sensor**: is defaulted to **Closed** for the wired gun start. If using the Radiolynx then set **Start Sensor** to **None** to turn off the wired start (they are independent of each other.

5. Click to select the **Capture** tab:
a. **Capture Method**: select **Manual** if using the Capture Button or **Automatic** if using ACM plug-in (both methods can be active at the same time by selecting both).
6. Click **OK** to close the **Camera Settings** and it is advised to restart the FinishLynx software.
7. Set White Balance

a. Open a new event in FinishLynx by clicking  in the top left corner of the screen.
b. Capture a small amount of image containing a white object, such as a person wearing a white t-shirt.
c. Right-click and draw a box around a small amount of the white image. You may need to zoom in to the image to do this.
d. Click **Image** from the Menu bar and select **Set white balance**.