

REACH
ROBOTICS

MICRO IP CAMERA

OPERATOR MANUAL | V1.3

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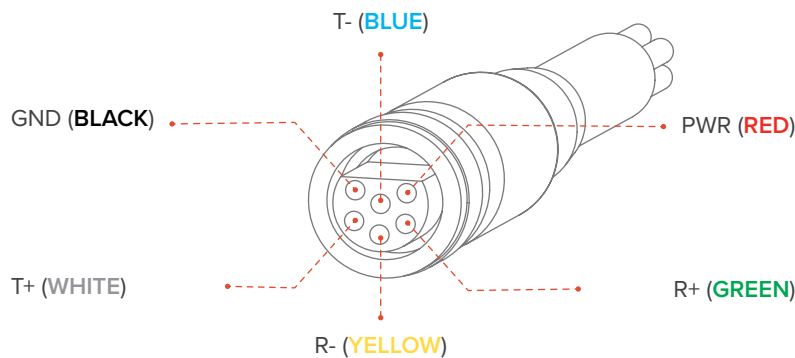
1 CONNECTING MICRO IP CAMERA

1.1 ELECTRICAL CONNECTION

The Micro IP cameras use Ethernet to connect to your computer or ROV. The Ethernet connection requires four pins on the supplied Breakout Board or your own breadboard, those pins being R-, R+, T- and T+.

- **RAC-1000**

The RAC-1000 Micro IP camera is typically used with the Reach Alpha manipulators. This camera comes with an unterminated Impulse whip cable containing 6 wires including power, ground and the 4 Ethernet connections. The pinout for this cable is shown below:



To connect the RAC-1000, the unterminated whip cable must be connected to both an Ethernet cable and a 12-48V power source. The Ethernet cable can then be connected directly to your computer to view the camera feed.

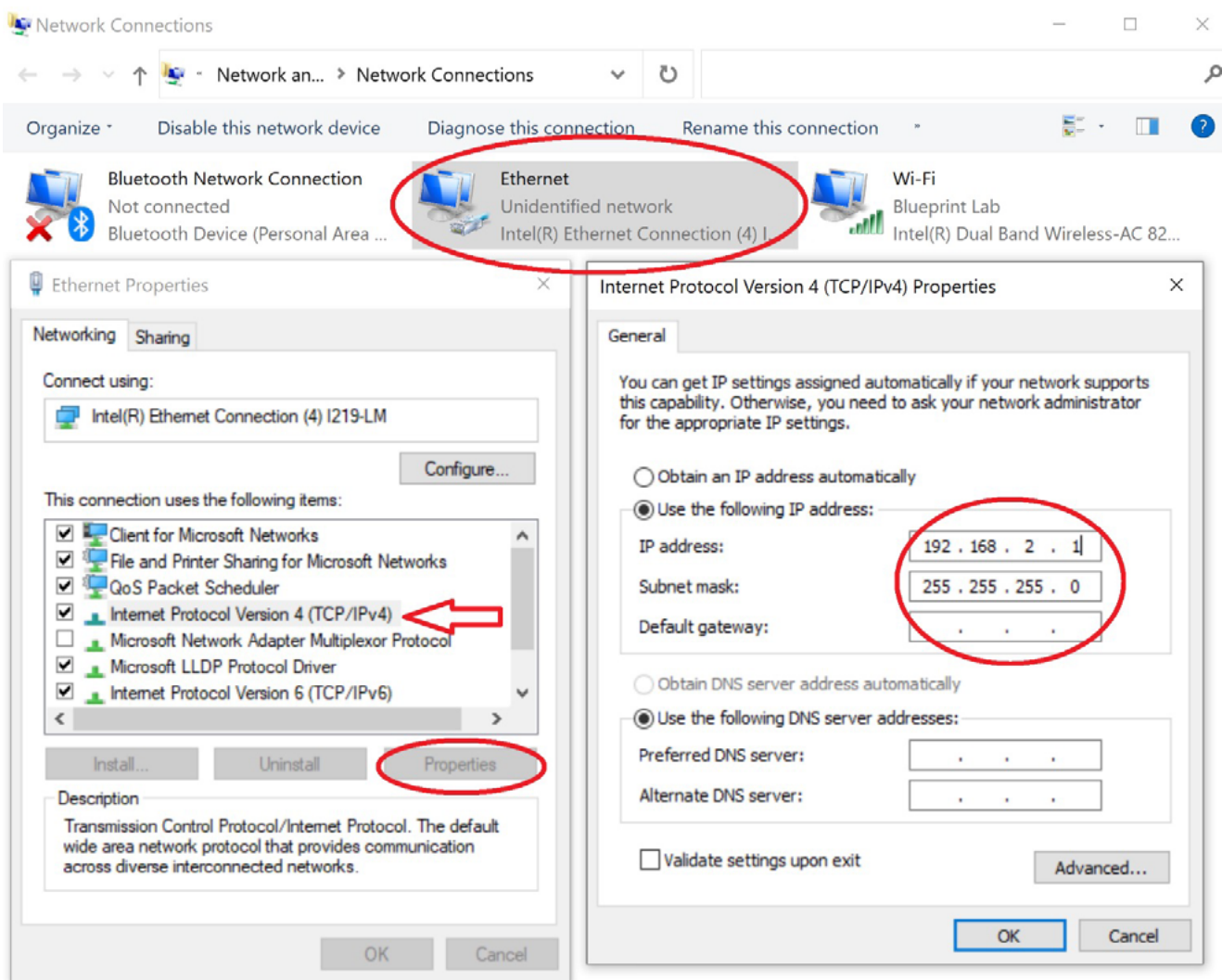
- **RB-1057**

The RB-1057 camera is designed for compatibility with the Reach Bravo manipulators. This camera can be mounted directly onto the wrist module, with all cabling connected internally. If the Ethernet cables need to be accessed, their termination locations on the breakout board can be seen below.

2 VIEWING CAMERA FEED IN REACH CONTROL

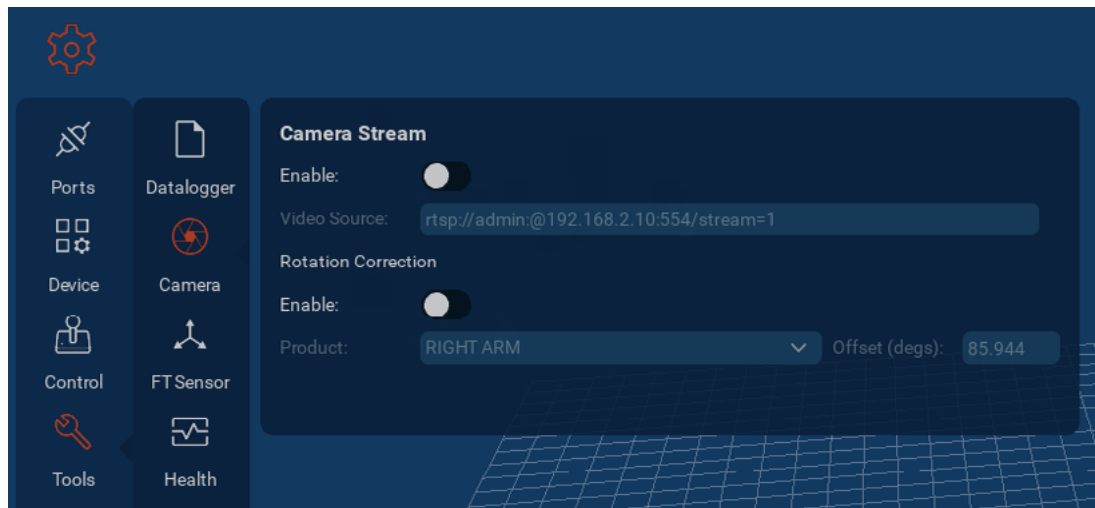
STEP 1

Check the IP address of the Ethernet port you have connected the camera to, and ensure it is set to the same subnet as the camera. To do this go to **Control Panel → Network and Internet → Network and Sharing Center → Change adapter settings** on your computer, right click on the Ethernet port and select “**Properties**”. In the window that opens, select Internet Protocol Version 4, and click “**Properties**”. Another window will open, where you can enter an IP address for this Ethernet port. This address should be set to [192.168.2.XX], where XX represents a port number that has not been used. This number should not be 10, as this is the address for the camera. The subnet mask should enter automatically, if not it should be entered as [255.255.255.0]. Click “**OK**” in each window, and this step is complete.



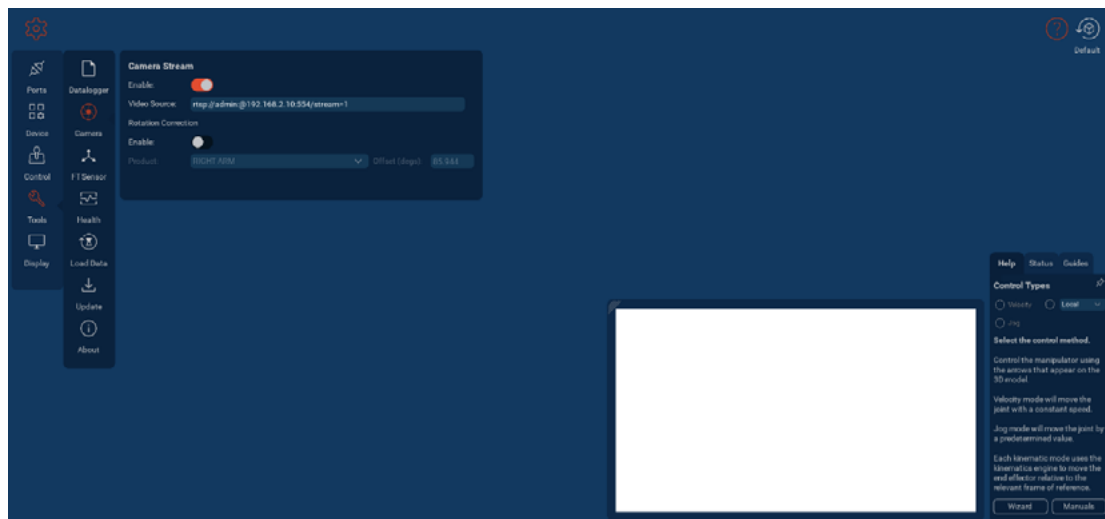
STEP 2

Open Reach Control on the same computer. Click on the gear icon in the top left-hand corner of the screen, followed by **Tools** → **Camera Stream**. Note that the IP address within the “**Video Source**” field should be <rtsp://admin:@192.168.2.10:554/stream=1>.



STEP 3

Toggle the “Enable” switch below “Camera Stream” to open the camera feed. If the camera is connected correctly, the feed should appear in the white window. This window can be resized by dragging the top left corner.



2.1 ACCESSING MAINSTREAM

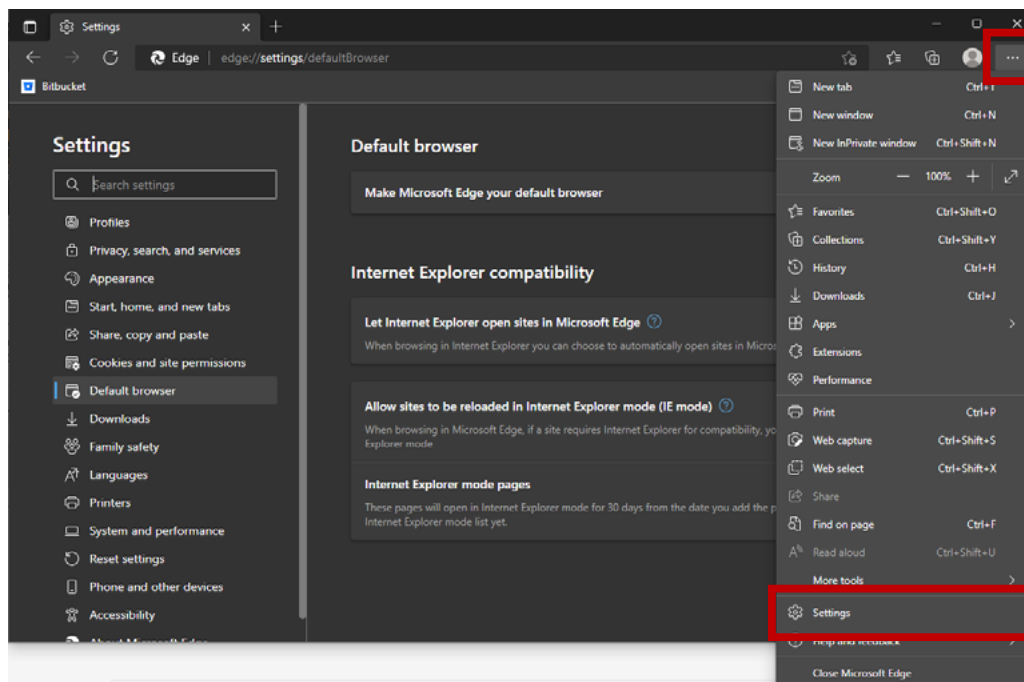
If a higher resolution is desired, the stream can be set to 0 to access the mainstream. This can be changed in the video source field by entering `rtsp://admin:@192.168.2.10:554/stream=0`. The mainstream has a resolution of 1920x1080. More information about feed resolution can be found in [Section 3.6](#).

3 VIEWING FEED THROUGH WEB BROWSER

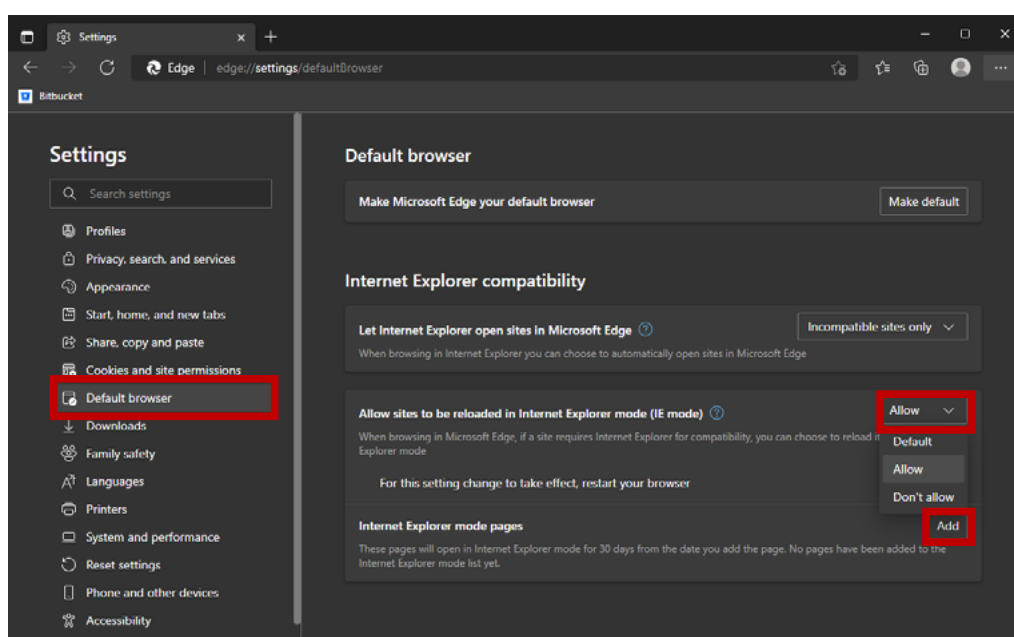
3.1 SETTING UP THE WEB BROWSER INTERFACE

This section describes how to access the camera feed using the ActiveX plugin for Internet Explorer/Microsoft Edge. This plugin can also be used to change properties of the camera including the IP address and resolution. If using Microsoft Edge, it must be set up in Internet Explorer Mode for the plugin to work (see instructions below).

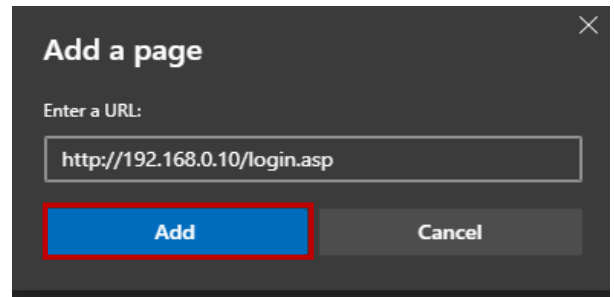
Open Microsoft Edge and go to “Settings” (three dots in the top right corner).



Go to the “Default Browser” section. Change the option to let sites be reloaded in Internet Explorer Mode (IE Mode).

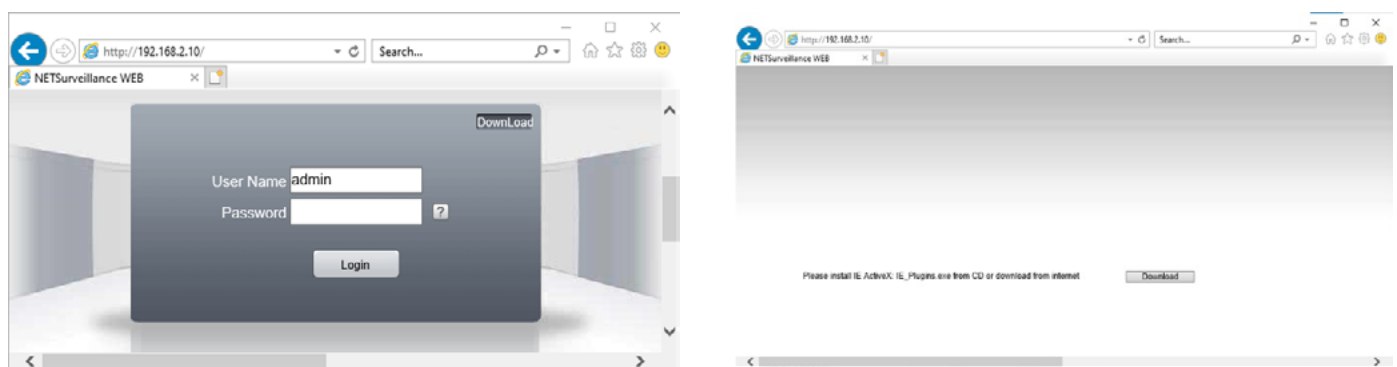


Press “Add” then type in the corresponding log in page (<http://192.168.2.10/login.asp>). Change the address to the IP of the camera if you have had it changed.

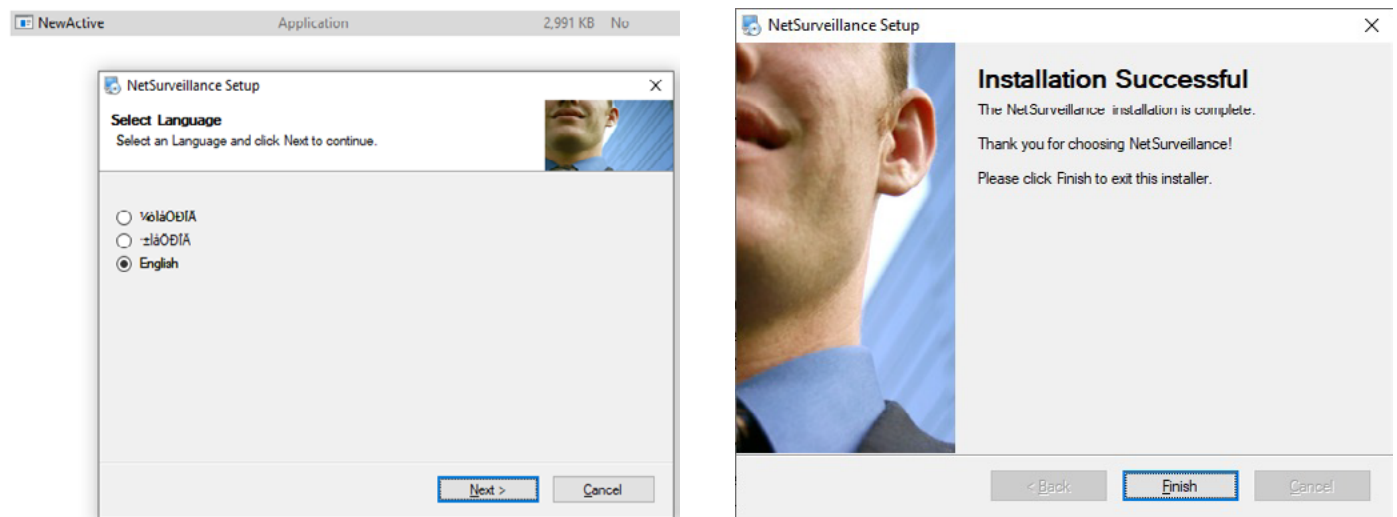


3.2 INSTALLING THE ACTIVEX PLUGIN

Using Internet Explorer/Microsoft Edge, enter the camera’s IP address [192.168.2.10]. If you have the ActiveX plugin installed, the camera login page will show (left). Otherwise, you’ll be prompted to download and install the ActiveX plugin (right). Contact [Reach Robotics Support](#) if you are unable to download the plugin.



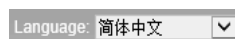
If you see the screen on the right, follow installation instruction for ActiveX (Net Surveillance) application.



Refresh the browser and log into the camera interface (**Username:** admin, **Password:** <not set>).

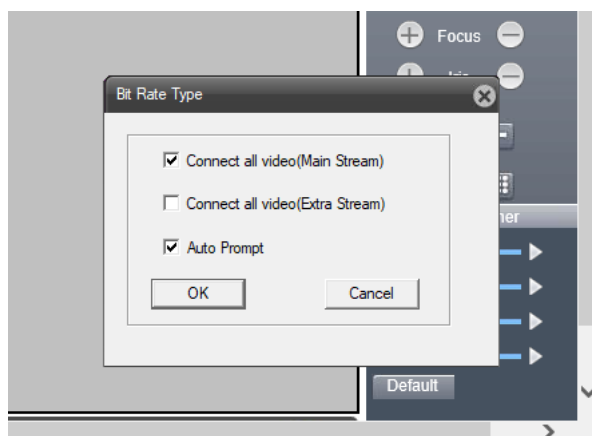
Note 1: Internet Explorer or Microsoft Edge **MUST** be used since the ActiveX plugin is not compatible with other browsers.

Note 2: You may need to change the language of the camera to English.



3.3 HOW TO VIEW THE CAMERA STREAM

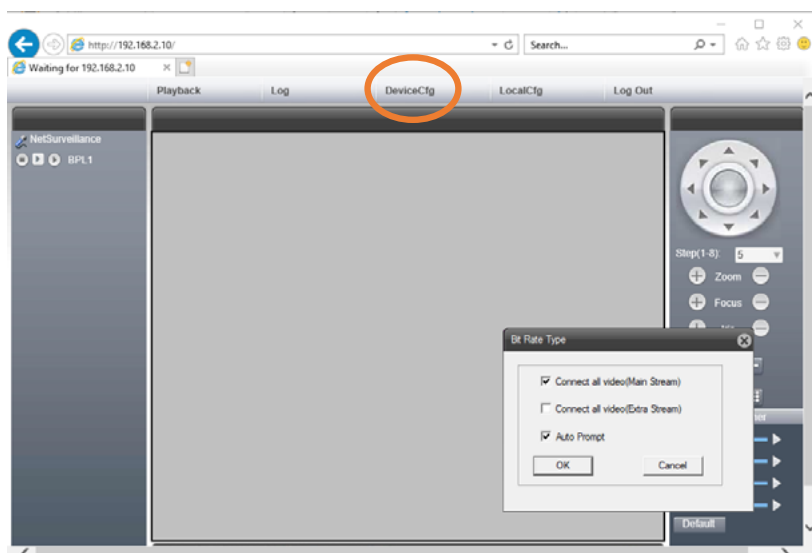
When the interface is logged into the camera, you'll be prompted with the following screen. You can display the mainstream by clicking "OK" to the default settings. The secondary stream can be shown by selecting "Connect all video (Extra Stream)".



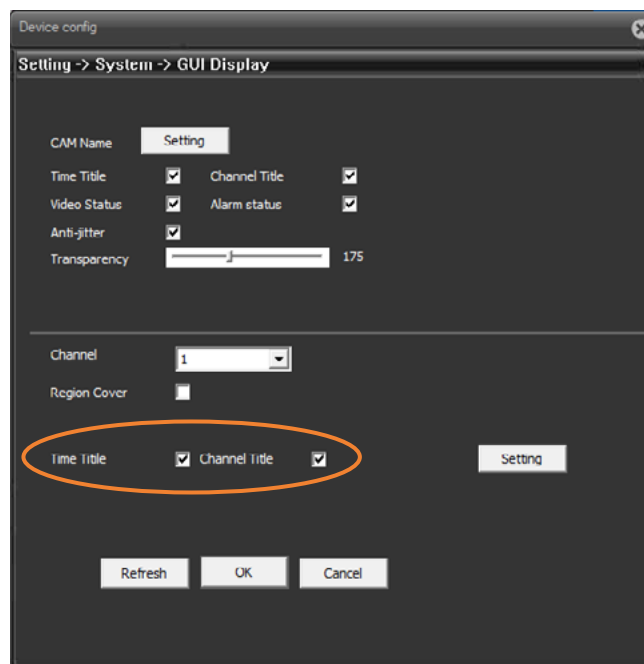
Note: The secondary stream is used by the Reach Control interface.

3.4 HOW TO EDIT GUI DISPLAY SETTINGS

Open "Device Config" and navigate to the "Settings" gear icon.



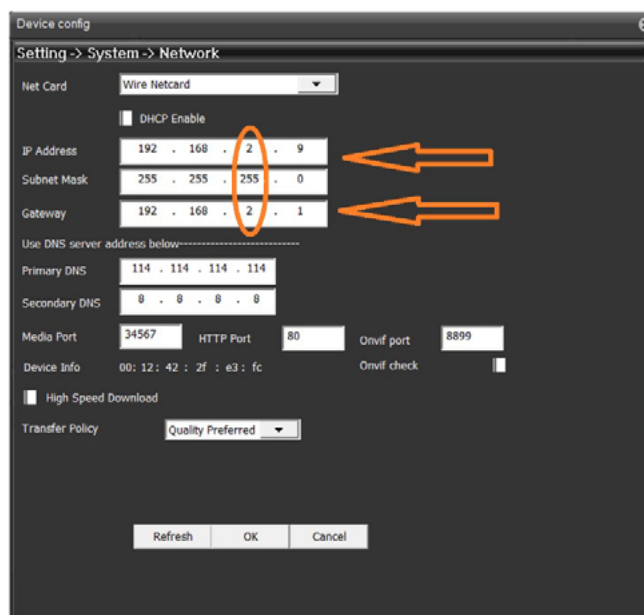
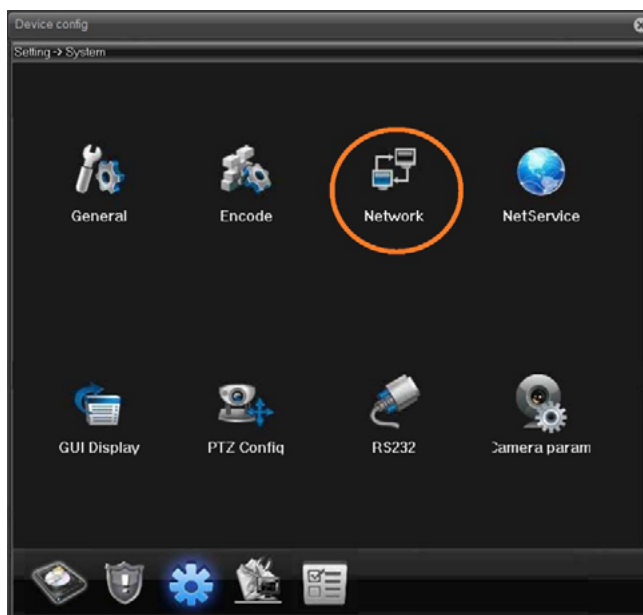
Select "GUI Display". The Channel and Time titles can be removed by toggling the corresponding tick boxes. These tick boxes are highlighted for the secondary stream in the image below.



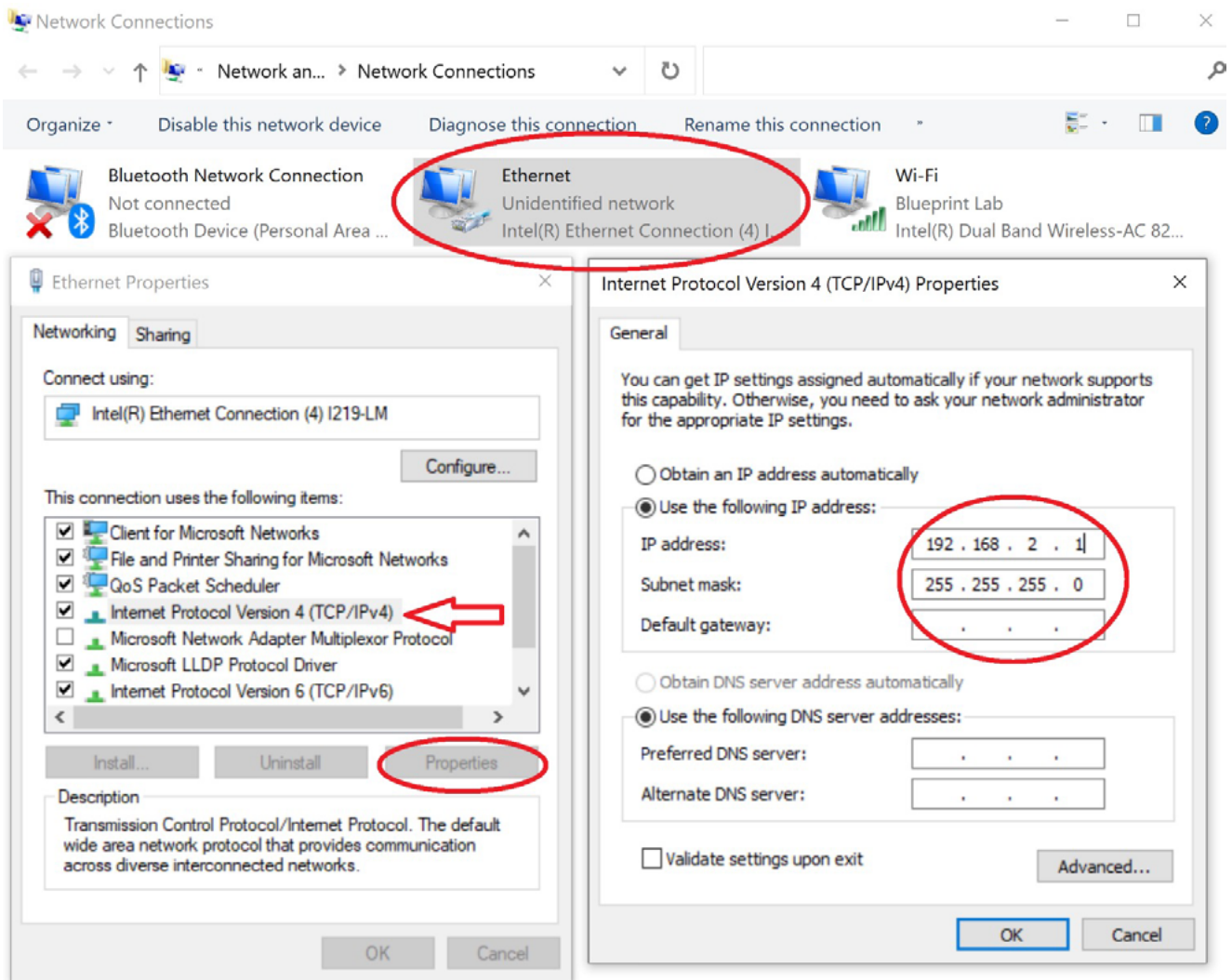
Select “OK” to save the changes and verify that they are saved by opening the camera stream.

3.5 HOW TO CHANGE CAMERA IP ADDRESS

The IP address of the camera can be changed through ActiveX. This is useful if the **subnet** (circled in orange) needs to be changed to match the rest of the network. To change the IP address, going into “Device Config” as shown above, click the “Settings” gear icon. From there select “Network”. This will bring up a panel showing the IP address of the camera.

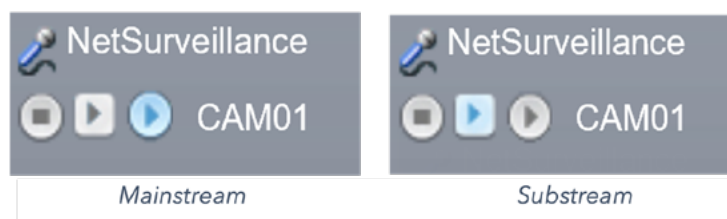


Ensure that the subnet is changed in both the IP address and the Gateway, then click “OK”. The video feed will disappear since the IP address has changed. To restore the feed, the IP address must be changed in your computer settings as well to match the new address. Once this has been done, enter the new IP address in your browser. The ActiveX video feed should reappear.



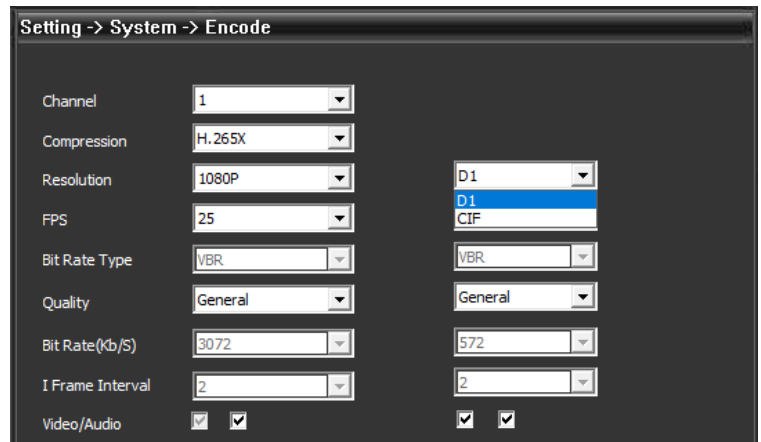
3.6 HOW TO CHANGE RESOLUTION

The camera has two video streams, a mainstream and a substream. The resolution of the mainstream is 1920x1080 and the resolution of the substream can be either 720x480 or 360x240, depending on what you select. To switch between the substream and the mainstream, select the desired stream in the top left corner of the display.



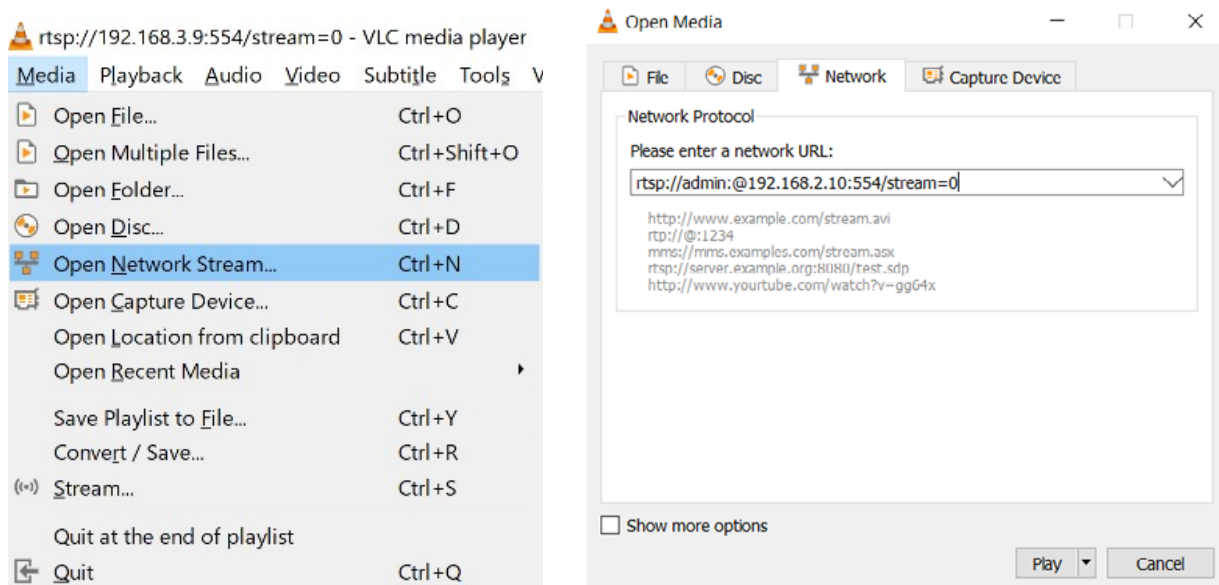
To change the resolution of the substream, in the “**Device Config**” panel, click on the “**Settings**” cog, and then select “**Encode**”.

In the second drop-down menu next to “**Resolution**” you can select either D1 or CIF. The resolution of D1 is 720x480, and CIF is 360x240. This changes the stream 1 (substream) properties of the camera.



4 VIEWING FEED WITH VLC MEDIA PLAYER

To view the camera feed with VLC Media Player, select the “**Media**” drop down menu, and then select “**Open Network Stream**”. Enter the same address as used for the Reach Control feed: `rtsp://admin:@192.168.2.10:554/stream=0`. Ensure the IP address is correct if it has been changed, and the desired stream is used. The substream can be accessed by setting `stream=1` in the feed address. Resolution information can be viewed in **Tools → Codec Information**.



4.1 CONNECTING TO UDP STREAM

It is possible to use a UDP connection to access the camera feed in VLC Media Player. This communication protocol is faster and more robust against data loss. To use a UDP connection, enter the camera address as `rtsp://admin:@192.168.2.10:554#transport=UDP/stream=0`. This connection method can also be used in Reach Control the same way, by entering the address with the addition of `#transport=UDP`. This method will work for stream 0 and stream 1.

Camera Stream

Enable:

Video Source:

rtsp://admin:@192.168.2.10:554#transport=UDP/stream=1

Rotation Correction

Enable:

Product:

RIGHT ARM

▼

Offset (degs):

85.944

4.2 LATENCY ISSUES

Users may experience some latency issues or ‘lag’ when viewing the camera feed through VLC Media Player. This can be addressed by lowering the caching value. In the same window shown above, where the camera address was entered, check the “Show more options” box. The window will extend and show an option for changing the cache rate, shown below. Reduce this value to between 500ms and 200ms, click “Play” and check the feed to confirm if the latency is acceptable. Be aware that if the cache value is too low, the feed may freeze. The optimal value can vary between machines so try a few variations to find the optimal level for your set up.

Open Media

File

Disc

Network

Capture Device

Network Protocol

Please enter a network URL:

rtsp://admin:@192.168.2.10:554#transport=UDP/stream=0

http://www.example.com/stream.avi

rtp://@:1234

mms://mms.examples.com/stream.asx

rtsp://server.example.org:8080/test.sdp

http://www.youtube.com/watch?v=gg64x

Show more options

Caching

1000 ms

Start Time

00H:00m:00s.000

Stop Time

00H:00m:00s.000

Play another media synchronously (extra audio file, ...)

MRL

rtsp://admin:@192.168.2.10:554#transport=UDP/stream=0

Edit Options

:network-caching=1000

Play

Cancel

5 VIEWING FEED WITH GSTREAMER

GStreamer is a software library for handling media, and may be used by those who wish to access the camera stream in your own program rather than using Reach Control or VLC.

To get a low-latency stream through GStreamer, use the code below:

```
sudo gst-launch-1.0 rtspsrc location=rtsp://admin:@192.168.2.11:554/stream=1 latency=0 buffer-mode=auto do-retransmission=false drop-on-latency=true ! decodebin ! autovideosink
```

For more information, please see the [GStreamer website](#).

6 VERSION CONTROL

Version	Date published	Edited by	Updates made
V1.0	2022	James Spinks	Initial version
V1.1	13/07/2022	James Spinks	Reach Robotics branding
V1.2	17/08/2022	John Sumskas	Addition of Microsoft Edge browser instructions
V1.3	30/03/2023	Ellie Best	Update of RC screenshots Addition of GStreamer code