



Micro IP Camera User Manual

V3.0

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1 Introduction

This manual is designed to help users of the Micro IP Camera get familiar with the integration and usage of the system.

Reach Robotics website and Help Centre

Our website, www.reachrobotics.com, holds all our documentation as well as FAQs, knowledge articles, and downloads. You can find some quick links below:

- [Datasheets and manuals](#)
- [FAQs](#)
- [Product theory](#)
- [Software downloads](#)

Reach Robotics contacts

If you can't find what you're looking for on our website or Help Centre, please get in touch with Reach Robotics Support at support@reachrobotics.com. You can also get in touch with us at sales@reachrobotics.com (for all sales enquiries), or info@reachrobotics.com (for any other enquiries).

Feedback

If anything in our manuals, FAQs or knowledge articles is out-of-date, poorly explained, or erroneous, please don't hesitate to let us know. We always appreciate the opportunity to improve our documentation for the benefit of all users.

2 Safety Information

2.1 Hazard Classification

 DANGER	Denotes a hazard with a high degree of risk that may result in death or serious injury if not mitigated or avoided.
 WARNING	Denotes a hazard with a medium degree of risk that may result in death or serious injury, or serious damage to the product, if not mitigated or avoided.
 CAUTION	Denotes a hazard with a low degree of risk that may result in moderate or minor injury, or damage to the product, if not mitigated or avoided.
 INFO	Denotes important information about a product or procedure.

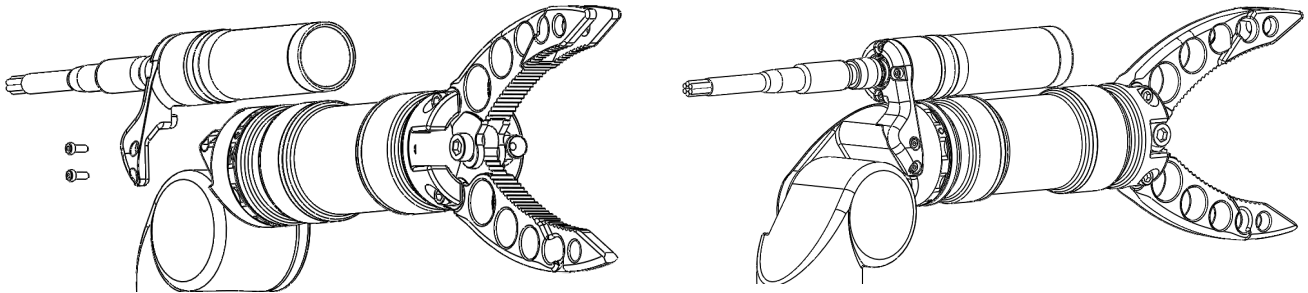
3 Interfacing and Integration

3.1 Standalone/Alpha Camera

The RAC-1000 Micro IP camera is typically used with the Reach Alpha manipulators or standalone.

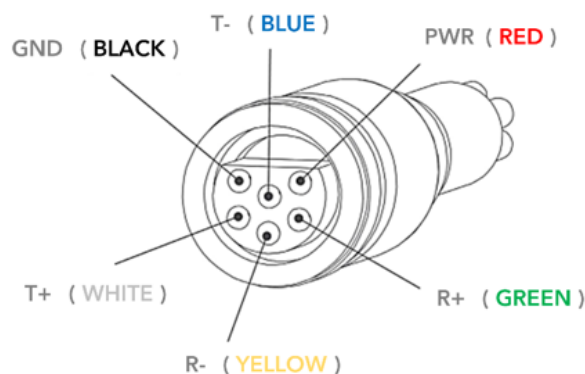
Mechanical

To mount the RAC-1000 to an Alpha 5 manipulator, locate the shoulder cap on Joint C and unscrew the two bolts. Replace the shoulder cap with the mount attached to the bulkhead of the camera, and secure it with the same bolts.



Electrical

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 12-48 V DC power source. The Ethernet cable can then be connected directly to your computer to view the camera feed. The connections using the supplied BOB are shown below: R-, R+, T- and T+.



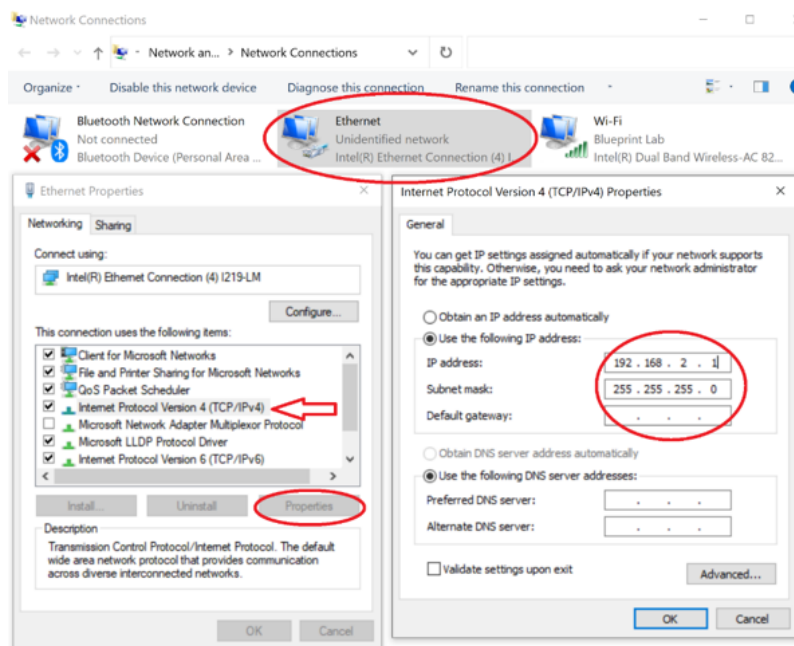
Communication

The IP camera has a default IP address of **192.168.2.10**. To connect the camera to a PC, you must configure the Ethernet port to which it is connected and ensure it is set to the same subnet as the camera.

Go to **Control Panel > Network and Internet > Network and Sharing Centre > Change adapter settings**, then right click on the camera 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 the 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 taken by the camera.

The subnet mask should enter automatically. If not, it should be entered as **255.255.255.0**. Click OK in each window to complete this step.

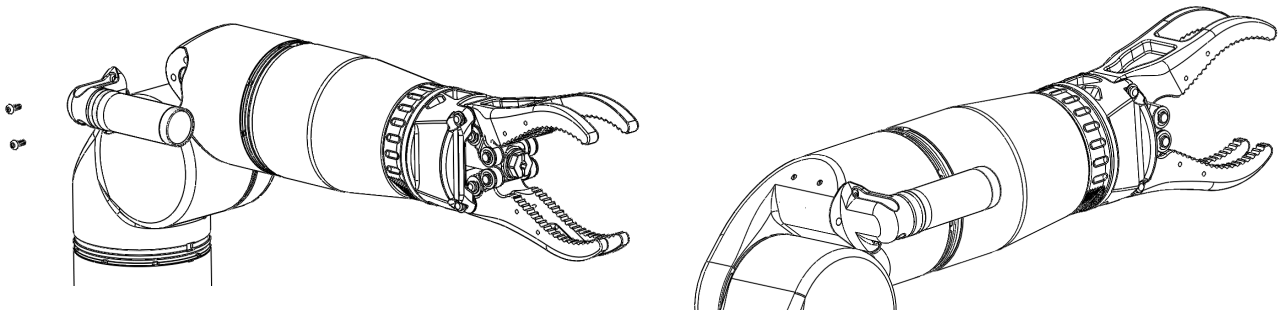


3.2 Bravo Wrist Camera

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. It can only be accessed over the default IP address if the Bravo is connected via Ethernet on the same subnet, so if unit IP addresses must be changed, it is recommended to set up the camera first before changing its or the Bravo's IP settings.

Mechanical

Locate the anode/blanking cap on Joint C and remove the bolts and cap to expose the accessory port connector. Install the wrist camera by connecting the Omnetics connectors, and secure with two bolts.



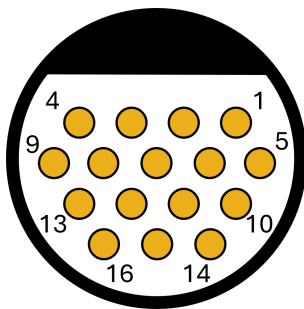
When you remove the anode or blanking cap from the Joint C accessory port connector, ensure you either replace it or install a wrist camera/accessory port. Leaving the accessory port connector open to the air can result in loss of vacuum from Joint C.



Ensure the camera connector has a clean greased O-ring installed and that the seal screw is not tampered with. These can lead to water ingress and damage if not adhered to carefully.

Electrical

The pinout for the Omnetics connector on the camera is shown below.



Pin #	Description	Pin #	Description
1	RX-	9	TX+
2	CAN L	10	GND
3	CAN H	11	PWR
4	TX-	12	PWR
5	RX+	13	GND
6	GND	14	PWR
7	GND	15	PWR
8	GND	16	PWR

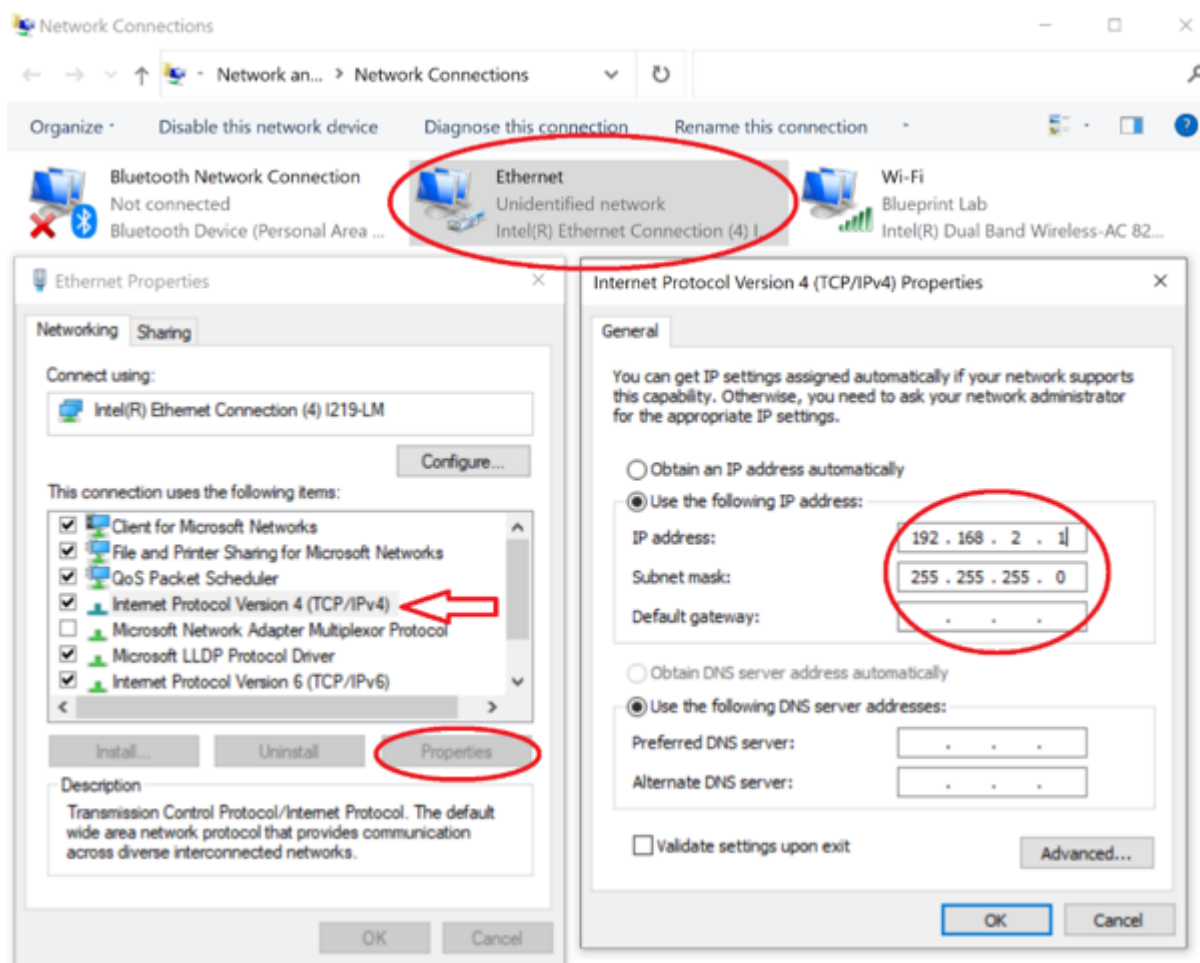
Communication

The IP camera has a default IP address of **192.168.2.10**. To connect the camera to a PC, you must configure the Ethernet port to which it is connected and ensure it is set to the same subnet as the camera.

Go to **Control Panel > Network and Internet > Network and Sharing Centre > Change adapter settings**, then right click on the camera 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 the 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 taken by the camera.

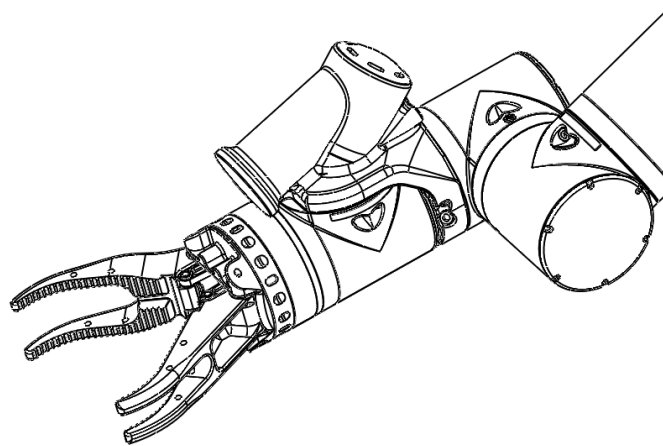
The subnet mask should enter automatically. If not, it should be entered as **255.255.255.0**. Click OK in each window to complete this step.



3.3 Reach X Wrist Camera

Mechanical/Electrical

The Reach X camera comes pre-integrated into the Reach X 5- and 7-function arms if purchased, and replaces the AB interconnect module.



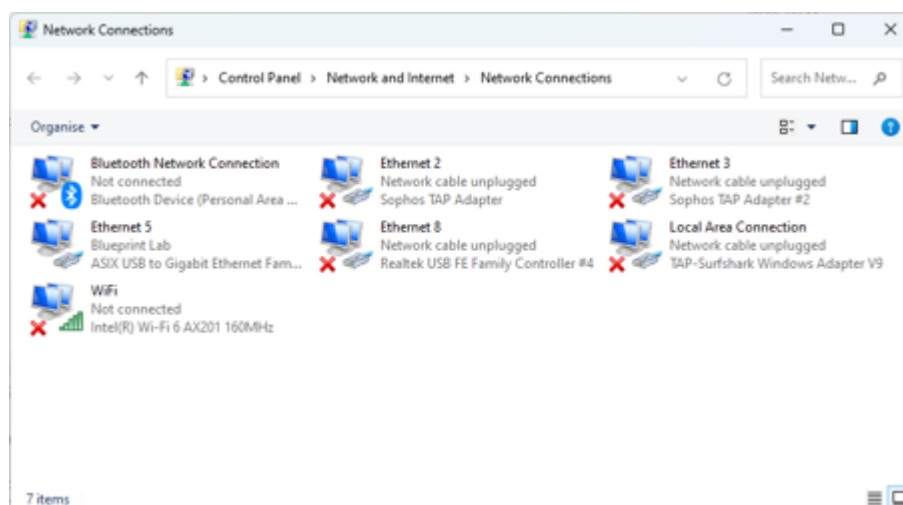
Communication

The RX camera has a default IP address of **192.168.1.10**. To access the camera stream, both the connected Ethernet port and the Reach X manipulator on which the camera is installed must be on the same subnet.



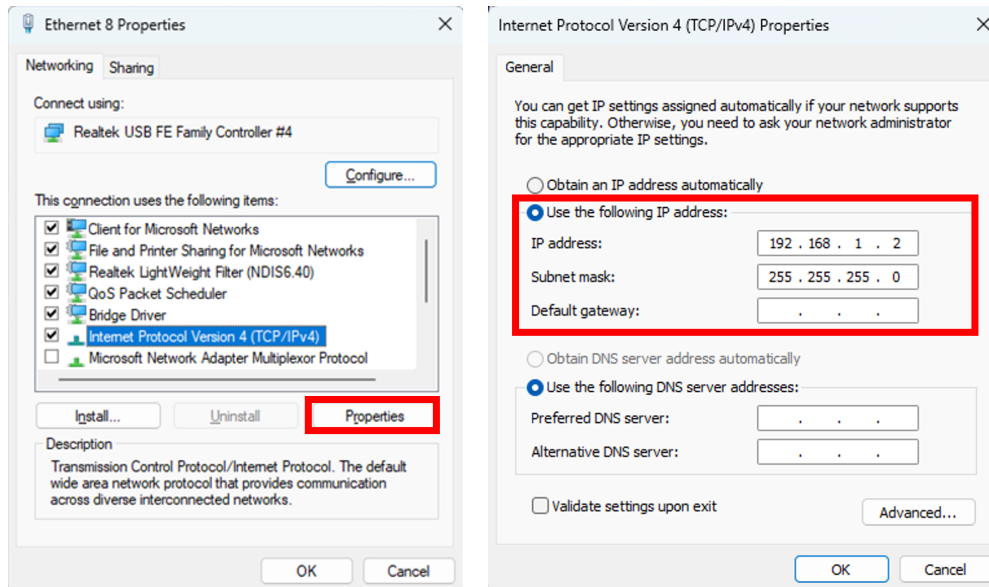
Previous users of Reach Robotics IP cameras should note the difference in IP address: 192.168.**1**.10, rather than 192.168.**2**.10.

Go to **Control Panel > Network and Internet > Network and Sharing Centre > Change adapter settings**, then right click on the manipulator 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 the Ethernet port. This address should be set to **192.168.1.xx**, where **xx** represents a port number that has not been used. This number should not be 10, as this is taken by the camera.

The subnet mask should enter automatically. If not, it should be entered as **255.255.255.0**. Click OK in each window to complete this step.



4 Viewing Camera Stream

4.1 Reach Control Software

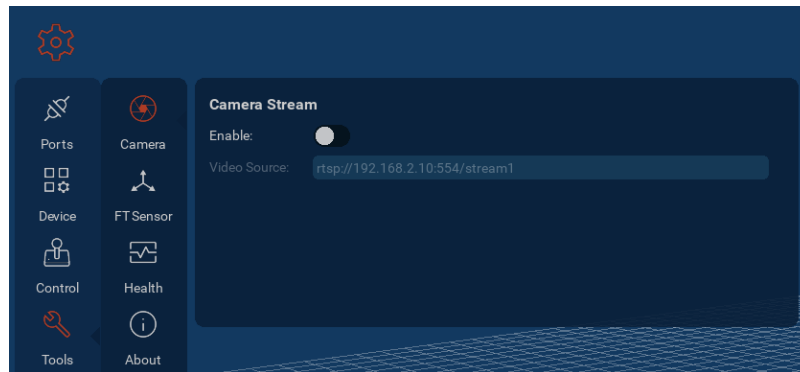


Reach Control should only be used to view streams from **RAC-1000** and **RB-1057** cameras. Download the full Reach Control manual from [our website](#) for more information.

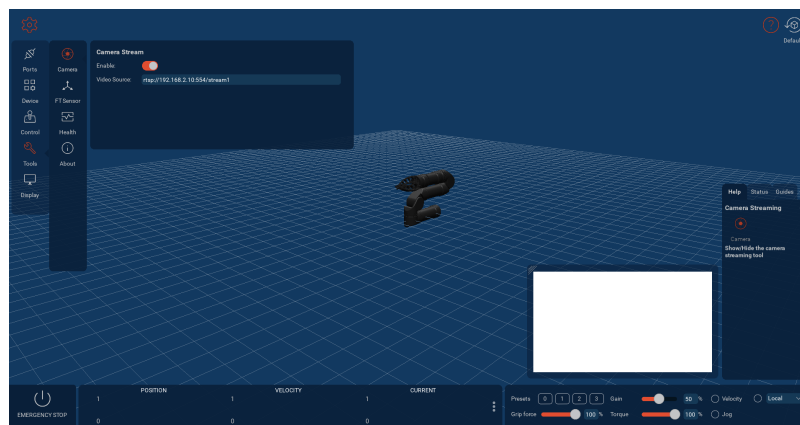


The camera stream function is **not available** on Linux Ubuntu versions of Reach Control.

Open Reach Control and go to **Settings > Tools > Camera**. Note that the Video Source field should read **rtsp://192.168.2.10:554/stream1**.



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.



To access the substream, change the stream in the video source field by entering **rtsp://192.168.2.10:554/stream2**.

4.2 Reach Mission Control Software

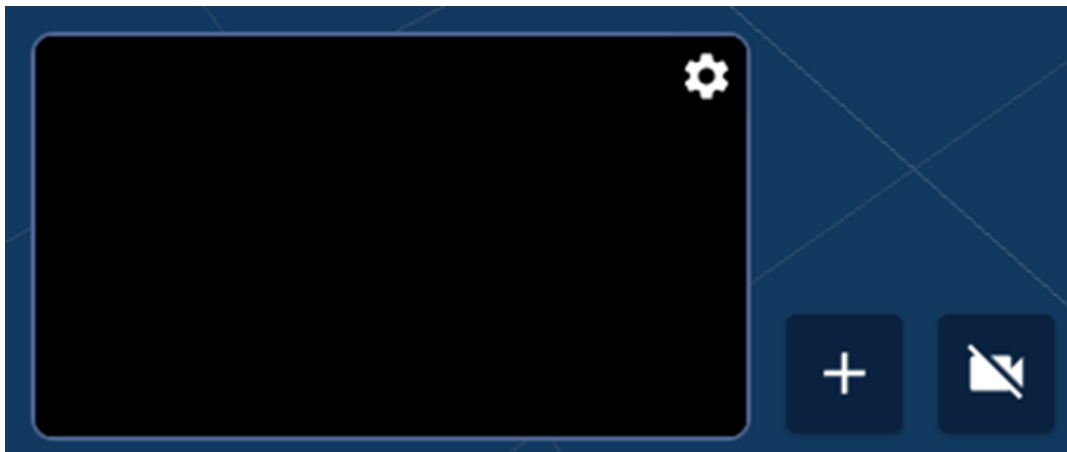


Reach Mission Control should only be used to view streams from **Reach X cameras**. Download the full Reach Mission Control manual from [our website](#) for more information.

Open Reach Mission Control. To add a camera feed, click the **Camera** icon at the bottom of the screen. By default, this will launch a video pane showing an RSTP stream to the Reach Robotics camera IP address **192.168.1.10**. If no camera is connected, the pane will show a black screen.

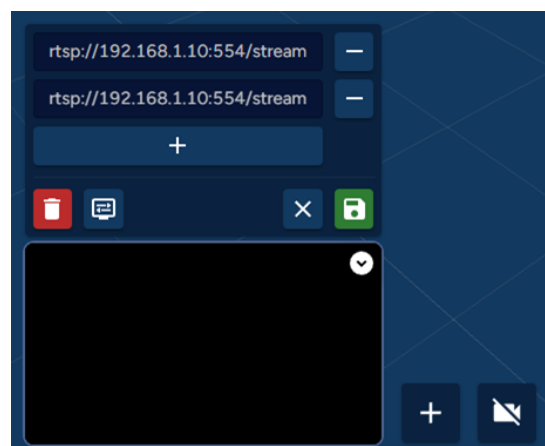
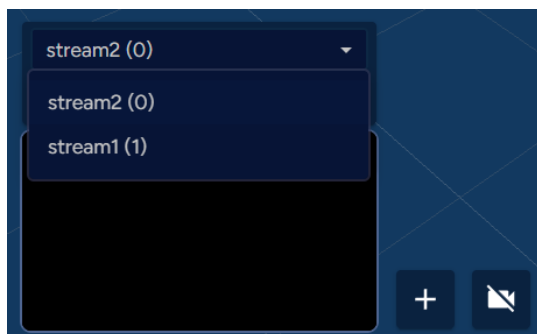


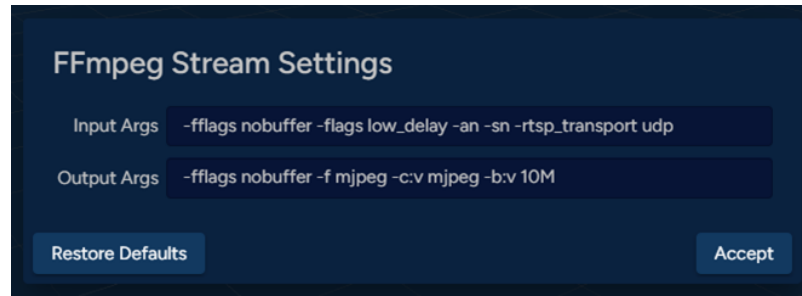
Click the **Add** button to add another video pane, or the **Delete** button to remove it.



Click the **Settings** button to open the video settings. From here you can use:

- **Popout:** this creates a popped-out video window which can be resized and moved around the screen. The video window is "Always On Top" and stays visible above all other active windows.
- **Dropdown:** choose stream1 or stream2 to view
- **Edit:** add/remove stream options, edit stream addresses, configure FFmpeg stream settings, or delete the video pane
- **Refresh:** refresh the video pane to troubleshoot issues

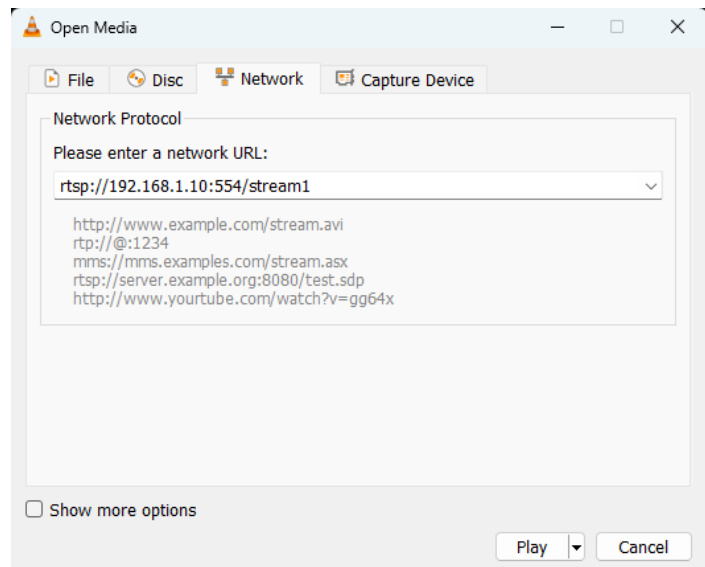
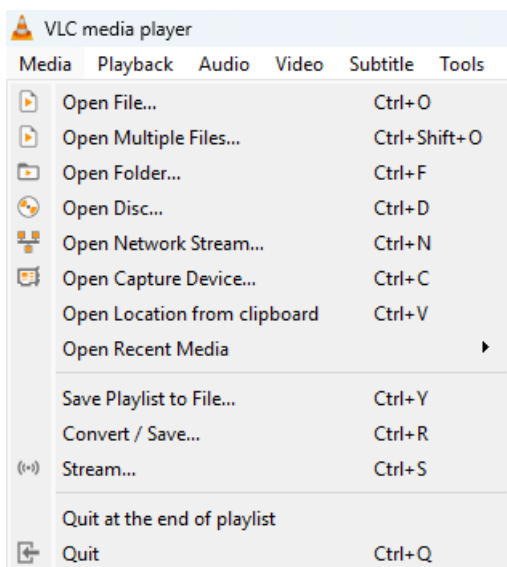




4.3 VLC Media Player

To view the camera feed with VLC Media Player, select the **Media** drop down menu, and then select **Open Network Stream**. Enter the address **rtsp://192.168.1.10:554/stream1** to access the Mainstream.

Ensure the IP address is correct if it has been changed, and the desired stream is used. The Substream can be accessed by setting **stream2** in the feed address. Resolution information can be viewed in **Tools > Codec Information**.



4.3.1 Connecting to UDP Stream

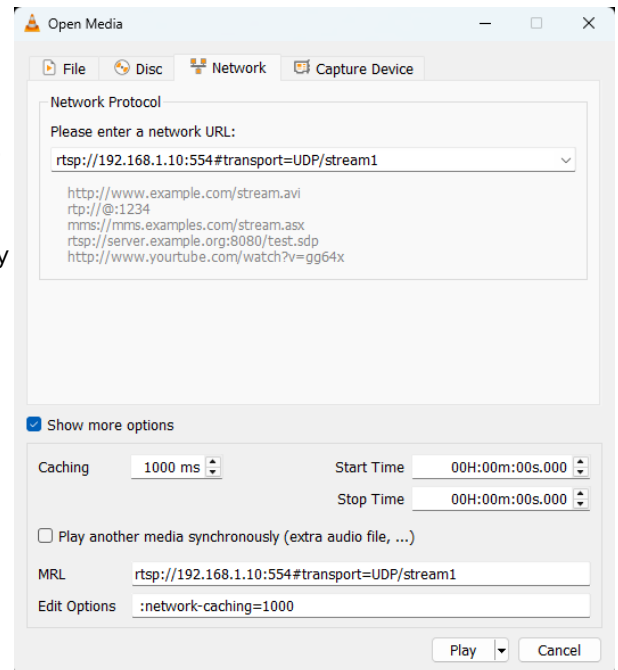
It is possible to use a UDP connection to access the camera feed in VLC Media Player. This communication protocol is faster and more robust against data loss. To use a UDP connection, enter the camera address as **rtsp://192.168.1.10:554#transport=UDP/stream1**. This method will work for Stream 1 and Stream 2.

4.3.2 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.

Go to **Media > Open Network Stream** and check the **Show more options** box. The window will extend and show an option for changing the cache rate. 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.



4.4 GStreamer

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

To get a low-latency stream through GStreamer, use the code below. A UDP stream may also be used to further reduce latency.

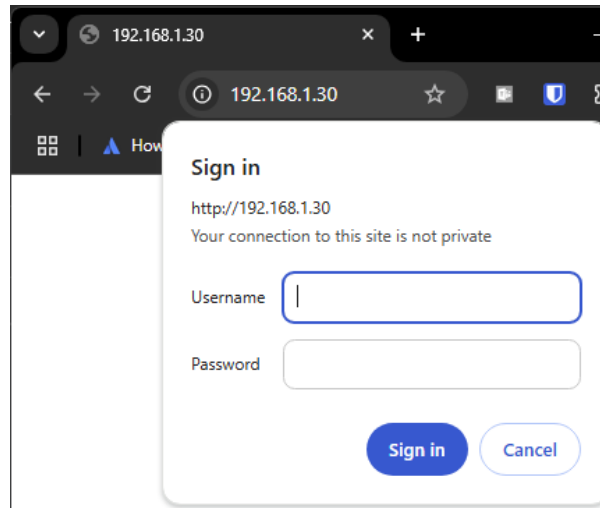
```
sudo gst-launch-1.0 rtspsrc location=rtsp://192.168.2.10:554/stream2 latency=0
buffer-mode=auto do-retransmission=false drop-on-latency=true ! decodebin !
autovideosink
```

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

5 Configuration

Any camera configuration must be completed in the camera module’s web browser interface. With the manipulator connected, open a web browser and enter the camera’s default IP address in the address bar. A sign in window will open; sign in with the following credentials:

- **Username:** admin
- **Password:** admin



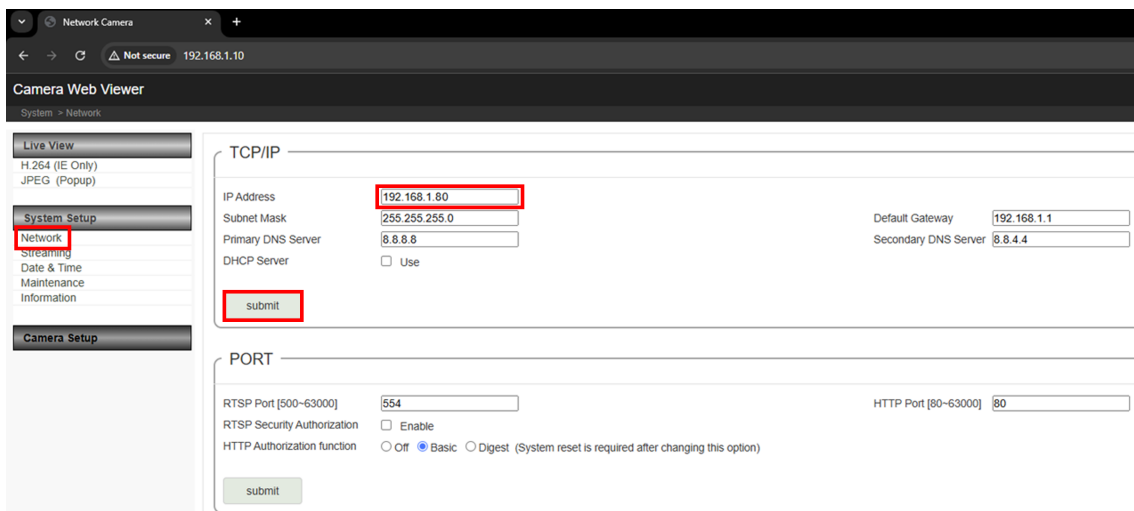
Once you are logged in to the web browser interface, you will see the default camera feed and be able to configure different camera settings.



Cameras manufactured prior to October 2026 may contain a different camera module that requires an alternate method of configuration. Please contact [Support](#) for access to an older version of this manual that details the procedure.

5.1 Change IP Address

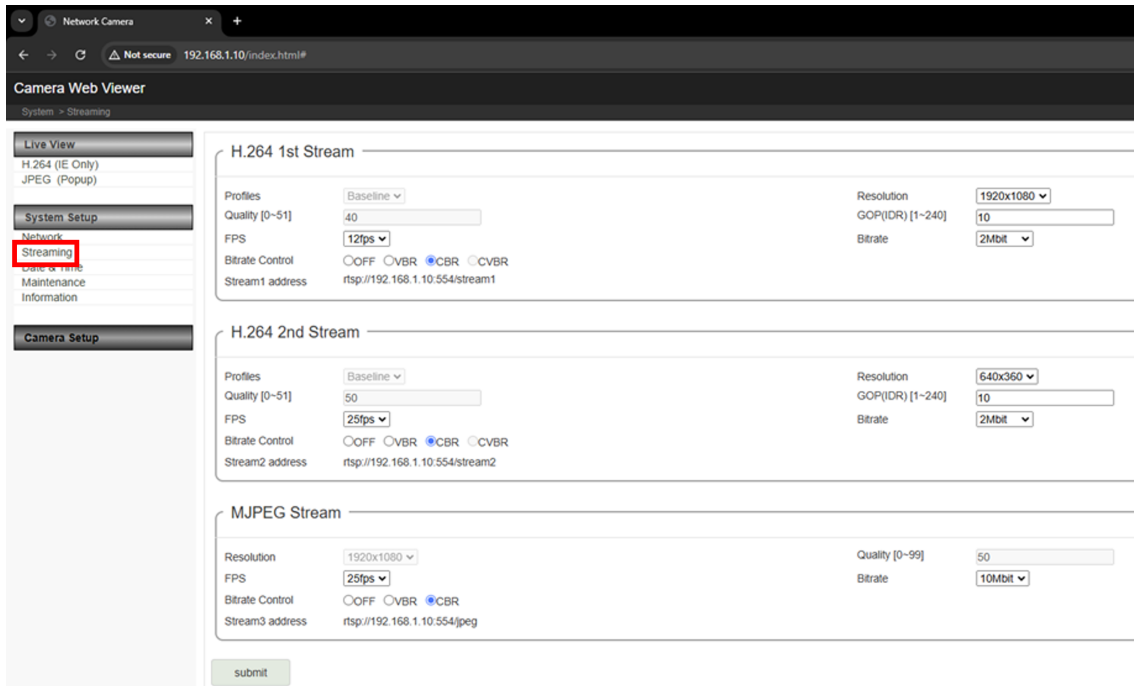
If the manipulator IP address needs to be changed, the camera IP address should be changed first to match the new subnet. To change the IP address, go to **Network**, edit the IP address, then click **Submit**.



The web browser interface will stop working once the IP address has changed. To restore it, change the IP settings on the Ethernet port to match the new subnet. Once this has been done, enter the new IP address in your browser and log back in to the interface.

5.2 Configure Camera Stream

The camera has three video streams, a Mainstream, a Substream, and an MJPEG stream. Go to **Streaming** to access the settings for each stream.



The screenshot shows the 'Camera Web Viewer' interface in a web browser. The left sidebar contains a menu with 'Live View', 'System Setup', 'Streaming' (highlighted with a red box), 'Camera Setup', and 'Maintenance Information'. The main content area displays settings for three video streams:

- H.264 1st Stream:**
 - Profiles: Baseline
 - Quality [0~51]: 40
 - FPS: 12fps
 - Bitrate Control: OFF, CVBR, CBR (selected), CVBR
 - Stream1 address: rtsp://192.168.1.10:554/stream1
 - Resolution: 1920x1080
 - GOP(IDR) [1~240]: 10
 - Bitrate: 2Mbit
- H.264 2nd Stream:**
 - Profiles: Baseline
 - Quality [0~51]: 50
 - FPS: 25fps
 - Bitrate Control: OFF, CVBR, CBR (selected), CVBR
 - Stream2 address: rtsp://192.168.1.10:554/stream2
 - Resolution: 640x360
 - GOP(IDR) [1~240]: 10
 - Bitrate: 2Mbit
- MJPEG Stream:**
 - Resolution: 1920x1080
 - Quality [0~99]: 50
 - FPS: 25fps
 - Bitrate Control: OFF, CVBR, CBR (selected), CVBR
 - Stream3 address: rtsp://192.168.1.10:554/jpeg
 - Bitrate: 10Mbit

A 'submit' button is located at the bottom of the settings area.

Under each stream can be found the **stream address**, which is required for viewing the stream in different programs.

H.264 1st Stream

Profiles	Baseline	Resolution	1920x1080
Quality [0~51]	1	GOP(IDR) [1~240]	1
FPS	12fps	Bitrate	1Mbit
Bitrate Control	☒ OFF ☐ VBR ☐ CBR ☐ CVBR		
Stream1 address	rtsp://192.168.1.30:554/stream1		



INFO

Previous users of Reach Robotics IP cameras should note the difference in stream address: rtsp://192.168.2.10:554/stream**1**, rather than rtsp://**admin:**@192.168.2.10:554/stream=**0**

The settings for each stream can be set independently. Use the following table to assist in changing the settings.

Setting	Range	Notes
Quality	0-51	A lower number corresponds to better quality
FPS	12-25	Frames per second; a higher number corresponds to better quality and increased data being sent
Bitrate control	OFF, VBR, CBR, CVBR	Variable bitrate, constant bitrate, constrained variable bitrate
Resolution	1920x1080	Resolution of the image in the camera stream
GOP(IDR)	1-240	Group of pictures; better to be low
Bitrate	1Mbit	A lower number corresponds to more data being sent and lower quality

6 Maintenance

6.1 General Product Care

Reach Robotics products are intended for use in water or air. Other fluids may have an adverse effect on the materials used in their production.

Seal screws

- Do not remove any seal screws from the unit without access to a vacuum kit. Vacuum will be lost and the unit will be unfit for immersion.

Cleaning

- Units should be cleaned thoroughly after every deployment, dry or wet.
- Ensure connector blanks are installed to prevent water entering the connector.
- After immersion in salt-water, wash units in fresh water to prevent salt deposits and corrosion.
- After immersion in water with high suspended sediment, or if the unit has come into prolonged contact with the seafloor, ensure all debris is removed from the unit, focusing particularly on joint closures and moving parts to preserve sealing surfaces.
- Do not use harsh chemicals to clean any Reach Robotics products.

Replacements

- If your unit has sacrificial zinc anodes, these should be replaced when corroded.

Connector care (bulkheads, cables, blanking plugs)

- Keep connectors protected at all times when not in use to avoid mechanical damage and corrosion.

- Do not expose connectors to heat or direct sunlight for extended periods.
- Regularly check connector pins for signs of damage or corrosion.
- Ensure female connectors are free of debris – flush with compressed air if necessary.
- Ensure both male and female connectors are dry when mating to avoid potential insulation issues.
- Liberally apply silicon grease to both male and female connectors prior to every mating to prevent corrosion.

Cable care

- Avoid exceeding the minimum bend radius.
- When de-mating connectors, pull the connector rather than the cable to remove it.
- Consider strain relief methods if using externally powered tools at the end-effector of the unit.

6.2 Repairs

If your Reach Robotics equipment becomes damaged or faulty, it may need to be returned to Reach Robotics for investigation and repair under a **Return Merchandise Authorisation (RMA)**. Only a Reach Robotics engineer may authorise a return to our factory; the requirement may be determined through a phone call, email, or video call/remote access to the unit. If you suspect that an RMA may be required, please fill in this form and someone from Support will be in touch: [Request an RMA](#)

RMA Process

1. Reach Robotics Support will request details of the issue to determine whether a return is necessary.
2. If so, an RMA Number (RMAXXX-YYMMDD) will be issued to you, and the Reach Robotics engineer will request shipping details so we can organise a pickup of the equipment.
Do not send the equipment prior to being issued an RMA Number.
3. The equipment will be shipped to Reach Robotics Headquarters in Sydney, Australia (see Notes).
4. Our Production team will conduct an initial investigation on the unit, based on the information provided. This will take an estimated 1-2 weeks. Any delays due to the complexity of the problem will be communicated to you.
5. After the initial investigation, Reach Robotics Support will contact you with the findings of our Production team. If the unit is not under warranty, a quote for the investigation, repair work and shipping costs will be included. If the unit is under warranty, you will be notified, and the repairs will be carried out free of charge.
6. To authorise a non-warranty repair, send a PO for the work to Reach Robotics Support (see Notes). Once this is received, the repair work will start, and our Accounts team will send an invoice to you.
7. Typical repair times vary post-investigation, and the exact length of time required for the repair will depend on the product being repaired, the complexity of the repair, and the availability of spare parts.
8. Any delays to the expected shipping date will be communicated to you. Priority service may be possible; please discuss this with your usual Reach Robotics Sales Engineer.
9. When the repair is completed, our Warehouse Manager will organise returning shipping and contact you with a ship date and tracking information (see Notes).



Health and Safety

- Any unit returned to Reach Robotics must be safe for our staff to handle and cleaned thoroughly to comply with Australian biosecurity regulations. We require you to declare if the unit may be contaminated. If the unit has been in contact with any contamination, you must provide proof that the unit is safe to handle.
- Possible contamination sources include nuclear radiation, sewage, hazardous chemicals, biowaste, marine/freshwater life, or soil/mud.
- Reach Robotics reserves the right to refuse to handle any contaminated goods and return them to you at your own expense.

Notes

- Standard Warranty of 1-year from date received is provided on all new Reach Robotics Products. There is no warranty extension for units following an RMA unless extended warranty has been purchased prior to the RMA being raised.
- An investigation fee is chargeable on all non-warranty RMAs. This is payable even if you choose not to have your unit

repaired.

- If the nature of the repair is such that you feel it is uneconomical to carry out the work, a discount on a new unit may be possible; please discuss this with your usual Reach Robotics Sales Engineer. This remains at Reach Robotics' discretion, and no discount is guaranteed.
- All RMAs are shipped CPT. Any insurance desired by the customer is the customer's responsibility and Reach Robotics can take no responsibility for shipment losses or damages.
- If you do not make a decision regarding repairing, replacing, or scrapping your RMA within 12 months of its arrival at Reach Robotics, we reserve the right to charge storage fees on a weekly basis dependent on RMA unit type.

7 Revision History

Version	Date	Author	Notes
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
V1.4	24/04/2024	Ellie Best	Layout update RB-1057 connection details
V2.0	04/12/2024	Ellie Best	Update for consistency
V3.0	21/09/2026	Ellie Best	Major update to camera module Mechanical mounting instructions Addition of Reach X camera/Reach Mission Control instructions