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## BlueROV2 Software Setup

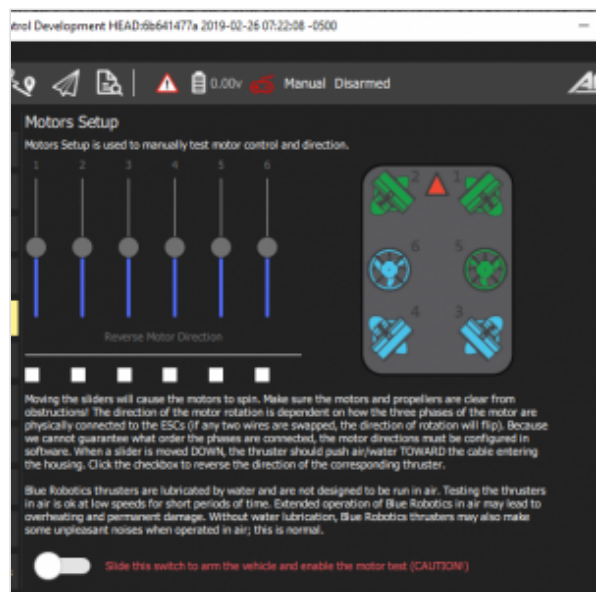
### Guides in this Series 🔗



### BlueROV2 Assembly

(<https://bluerobotics.com/learn/bluerov2-assembly/>)

Get your BlueROV2 built quickly with this assembly guide!



### BlueROV2 Software Setup

(<https://bluerobotics.com/learn/bluerov2-software-setup/>)

Get your BlueROV2 connected to a topside computer, the vehicle updated, and joystick properly calibrated!



## BlueROV2 Operation

(<https://bluerobotics.com/learn/bluerov2-operation/>)

Learn how to operate your newly built BlueROV2!

## Software Introduction %

These are instructions for the first time that you set up your computer to work with the BlueROV2. If you have not assembled your BlueROV2, please see our Assembly Guide (</learn/bluerov2-assembly/>) and assemble your BlueROV2 prior to setting up the software.

Select your operating system below to begin the installation and network configuration:

Windows

Mac

Linux

## QGroundControl Installation, Network Setup and Joystick Setup %

### Install QGroundControl for Windows %

To connect your computer to the BlueROV2, you need to download and install QGroundControl:

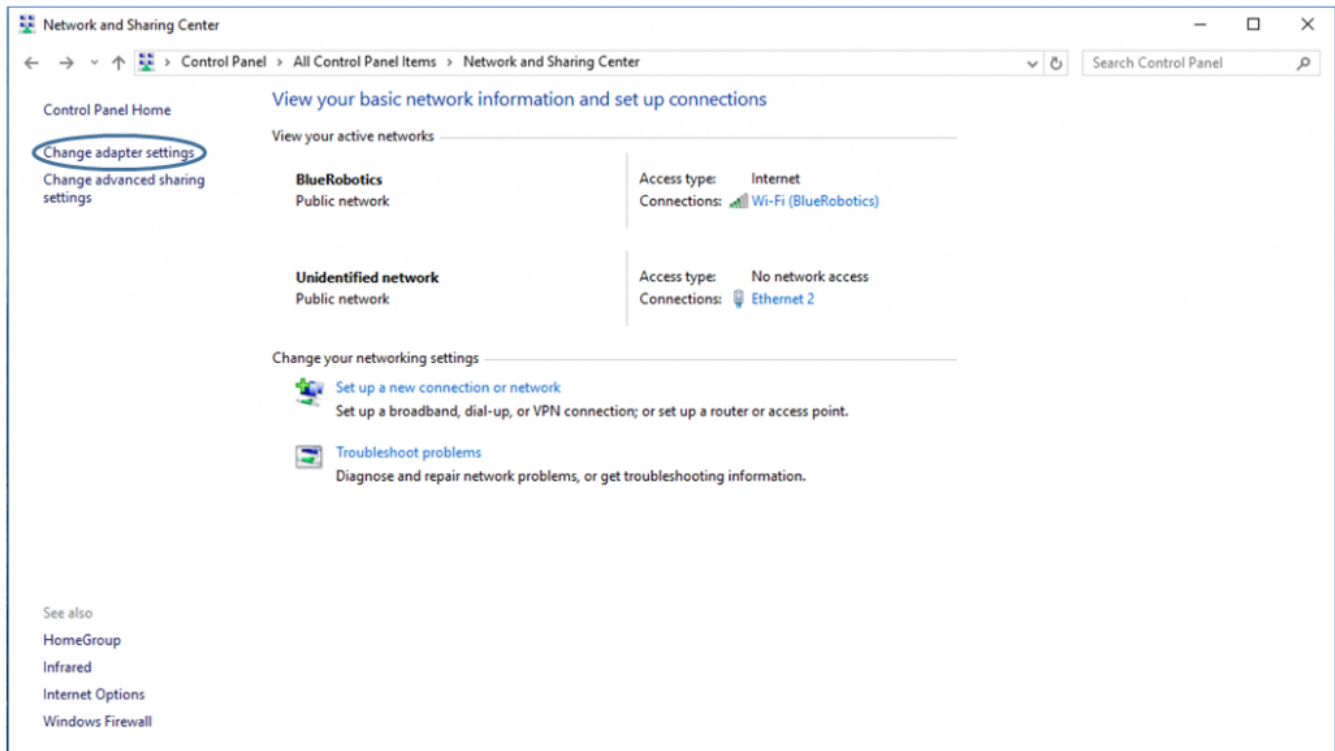
This is the current software version (updated 28 April 2019):

- QGroundControl: **v3.5.2** (release notes ([https://docs.qgroundcontrol.com/en/releases/release\\_notes.html](https://docs.qgroundcontrol.com/en/releases/release_notes.html)))
  - Windows (<https://s3.amazonaws.com/downloads.bluerobotics.com/QGC/latest/QGroundControl-installer.exe>)

## Windows Network Setup %

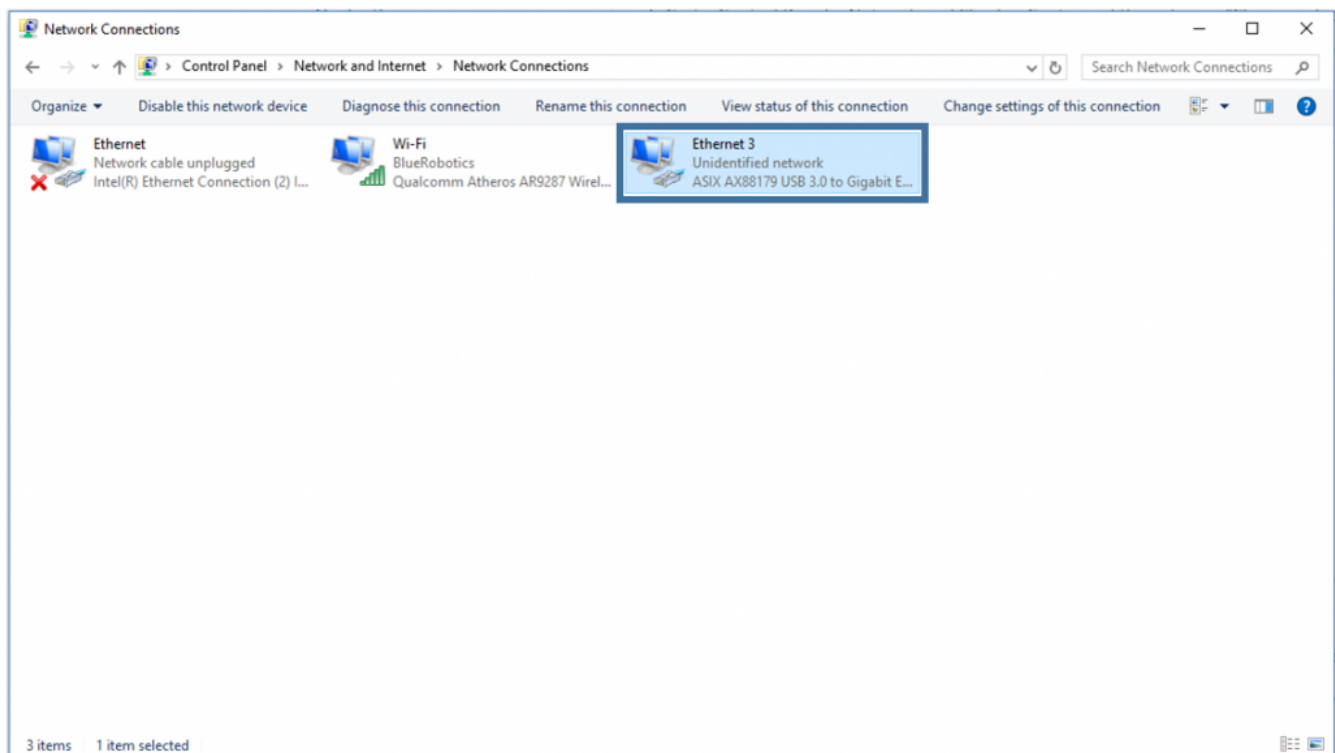
### Network Settings %

1. Go to *Control Panel > Network and Sharing Center* and then choose "Change adapter settings".



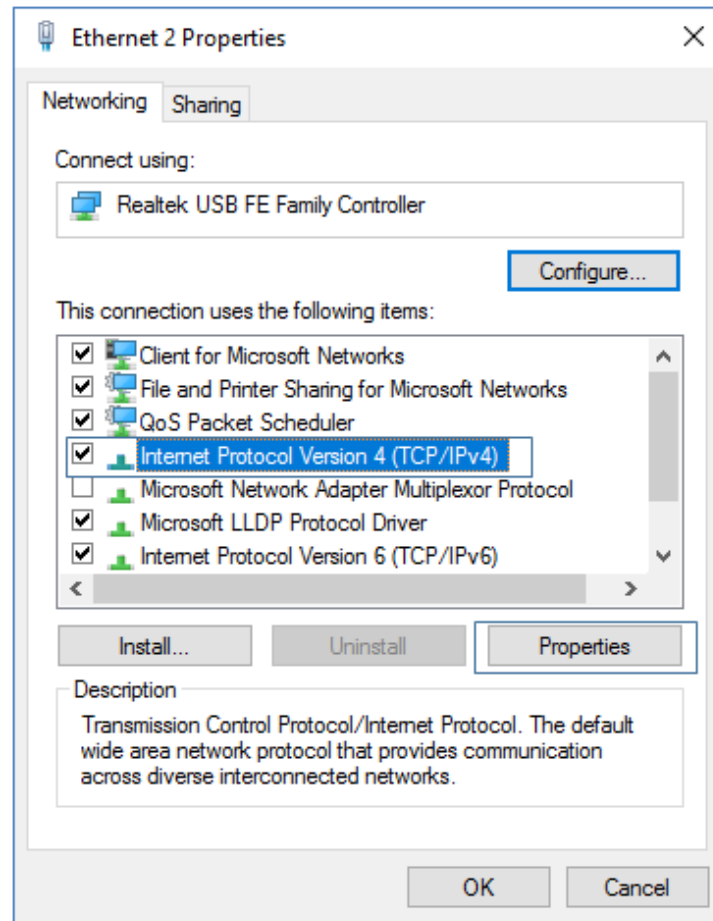
(<https://bluerobotics.com/wp-content/uploads/2019/03/network-and-sharing-center-annotated.png?x62571>)

2. Right click on the Ethernet adapter, then choose *Properties*.



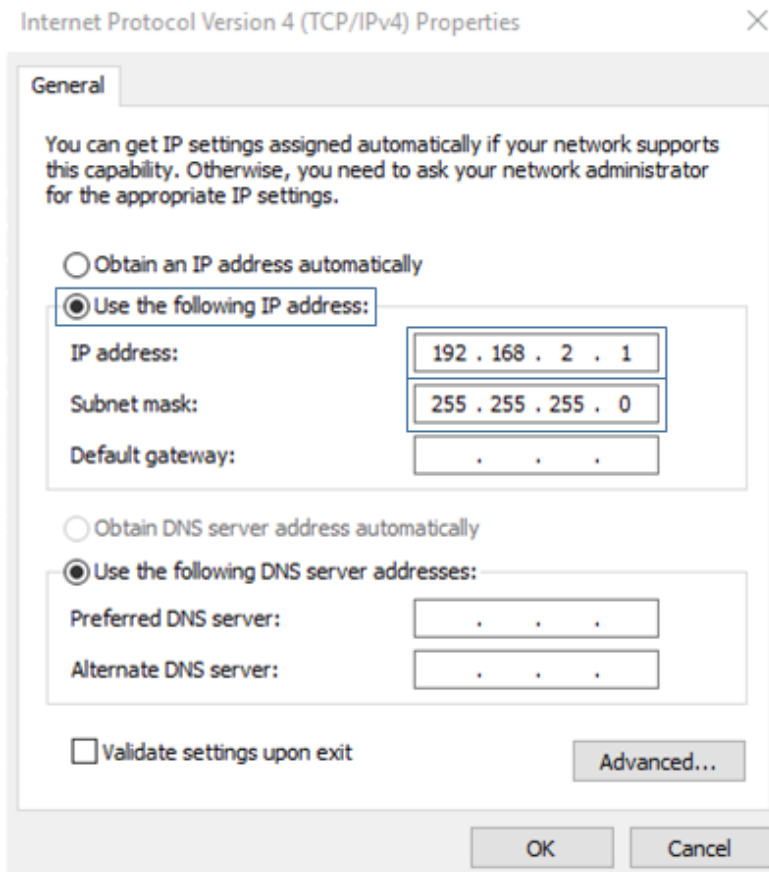
(<https://bluerobotics.com/wp-content/uploads/2019/03/network-connections-annotated.png?x62571>)

3. In the properties dialog, choose *Internet Protocol Version 4 (TCP/IPv4)*, then click *Properties*.



(<https://bluerobotics.com/wp-content/uploads/2019/03/internet-protocol-version-4-annotated.png?x62571>)

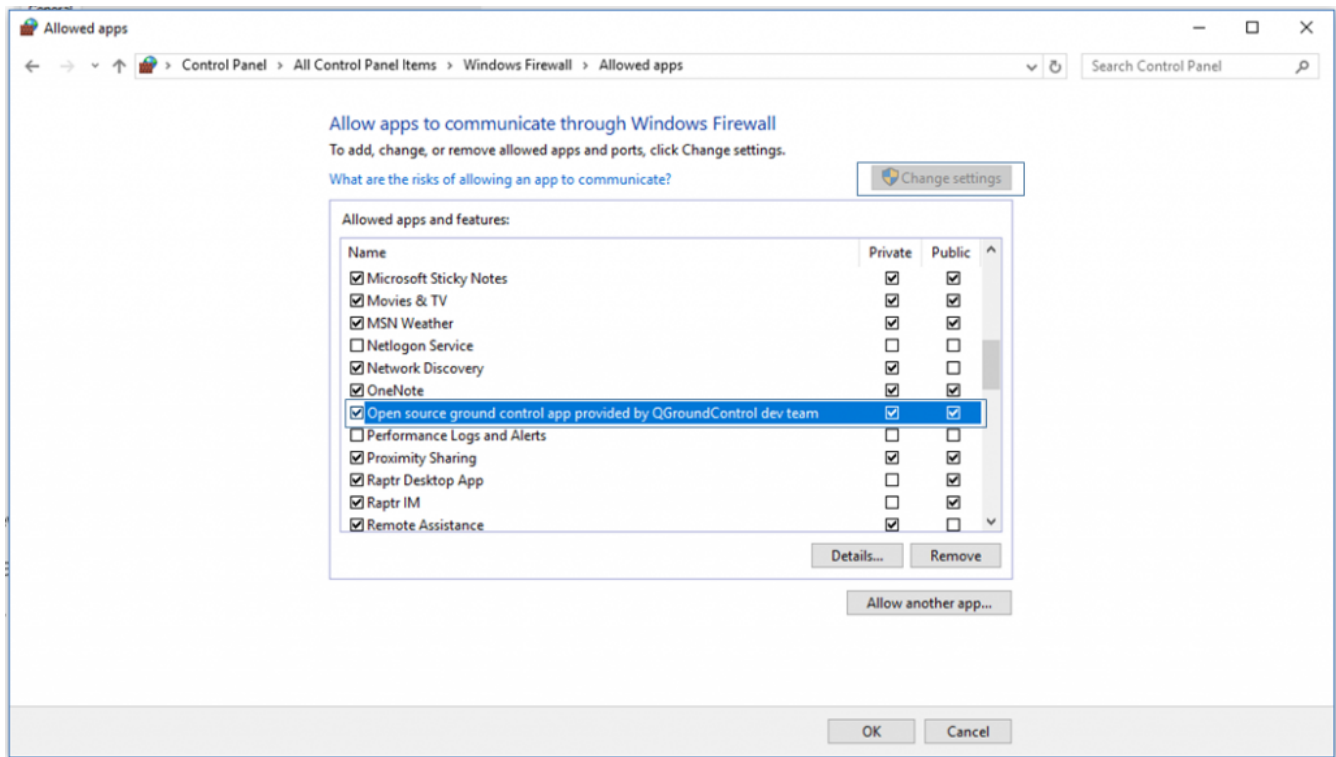
4. Select "Use the following IP address" And enter 192.168.2.1 for the IP address and 255.255.255.0 for the Subnet mask. Then select OK.



(<https://bluerobotics.com/wp-content/uploads/2019/03/static-ip-annotated.png?x62571>)

## Firewall 🔗

1. Go to *Control Panel > Windows Firewall* and then select "Allow an app or feature through Windows Firewall".
2. Select "Change Settings" and then select "Open source ground control app provided by QGroundControl dev team" or "QGroundControl".



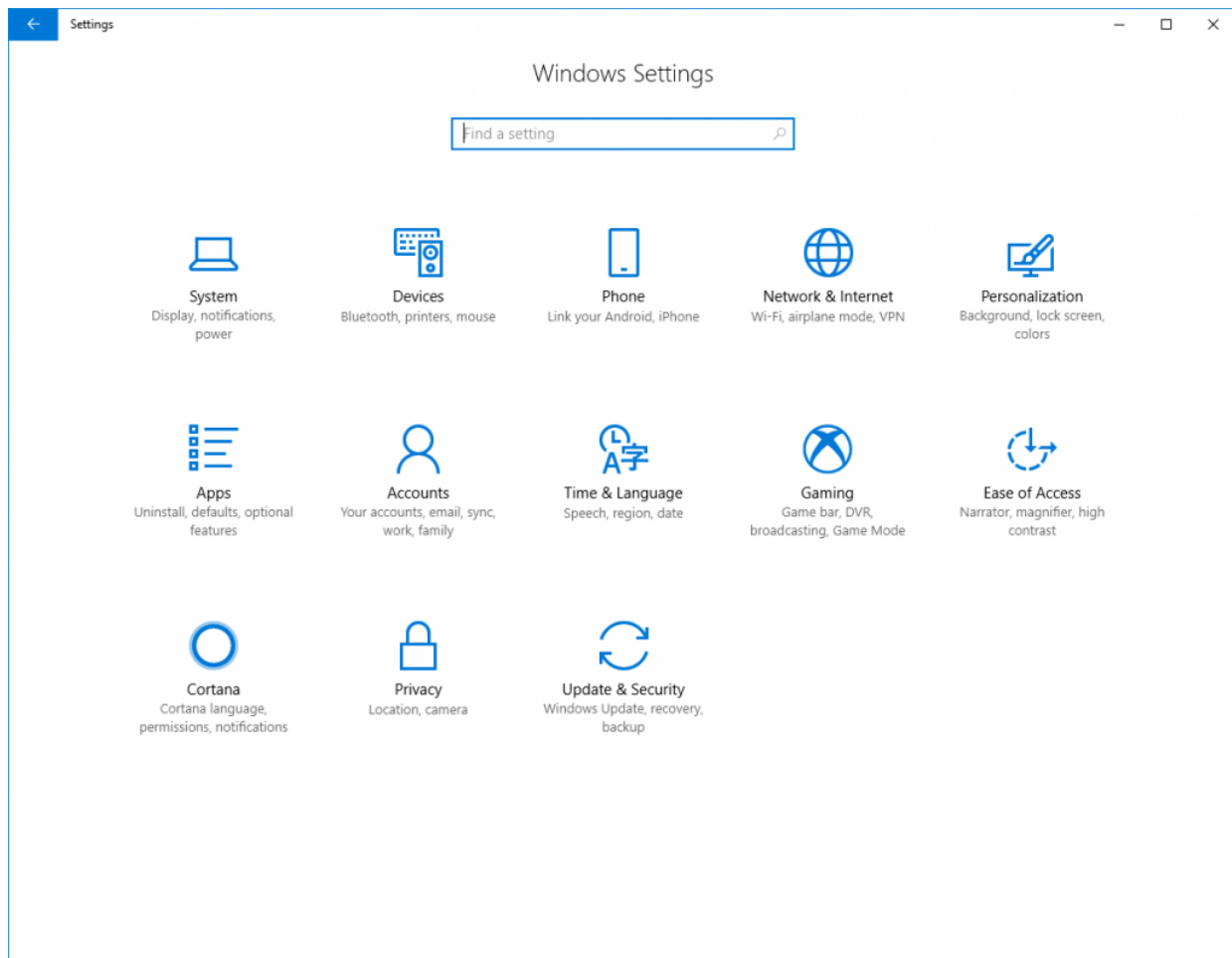
(<https://bluerobotics.com/wp-content/uploads/2019/03/windows-firewall-annotated.png?x62571>)

## Joystick Setup ☞

### Initial Setup for XBox Controllers on Windows ☞

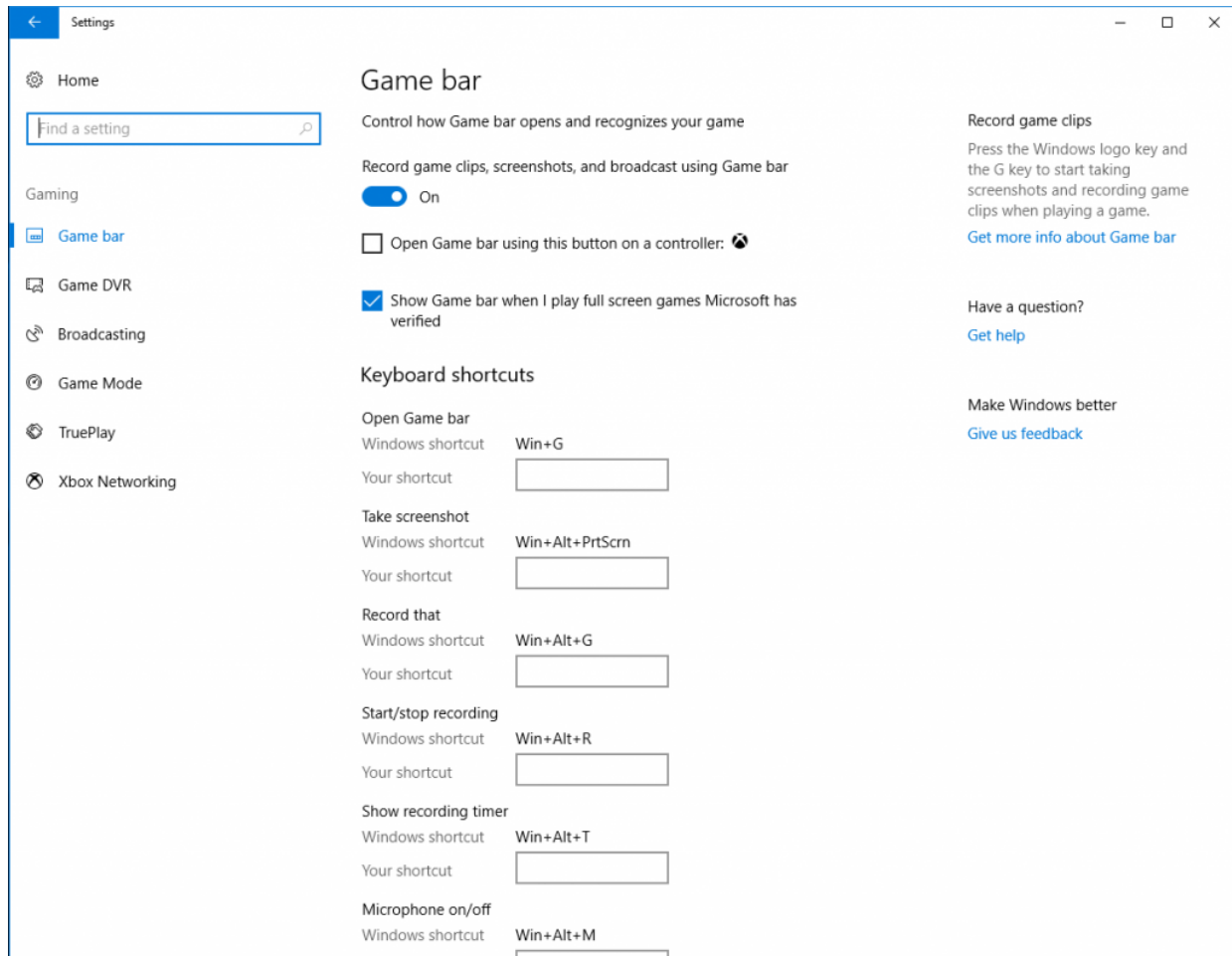
For using the shift button functionality of XBox Controllers on Windows:

1. Go to Start -> Settings
2. Open the Gaming settings



(<https://bluerobotics.com/wp-content/uploads/2019/03/settings.png?x62571>)

3. Go to Game Bar tab from the left navigation panel
4. Uncheck the 'Open Game bar using this button on a controller' option



(<https://bluerobotics.com/wp-content/uploads/2019/03/gamebar.png?x62571>)

This will enable the XBox home button on the controller to be used as the Shift button for ROV controls.

## XBox 360 Controller ☞

- Plug and Play

## XBox One Controller ☞

- Wired: Plug and Play
- Wireless:
  - 1. Plug in Microsoft XBox Wireless Adapter for Windows ([https://www.microsoft.com/en-us/p/xbox-wireless-adapter-for-windows-10/91dqrb97l130/jq56?cid=msft\\_web\\_collection&activetab=pivot%3aoverviewtab](https://www.microsoft.com/en-us/p/xbox-wireless-adapter-for-windows-10/91dqrb97l130/jq56?cid=msft_web_collection&activetab=pivot%3aoverviewtab)).
  - 2. Turn on the controller, then press the Wireless Enrollment button on the top of the controller and on the wireless adapter.

## Logitech GamePad (F710 and F310) ☞

- Logitech controllers should have the switch on the back set to "X".

## Testing the Connection to the BlueROV2 ☞

1. With the BlueROV2 still connected and powered on, start the QGroundControl application.



2. Wait a few seconds for the ROV to auto-connect and the green parameters bar to finish loading from left to right.
3. The video stream and telemetry information should now be shown in the QGroundControl application.



If the video stream is not shown or the vehicle does not connect, please follow the ArduSub Troubleshooting Guide (<https://www.ardubot.com/troubleshooting/troubleshooting.html>) before contacting Blue Robotics Support.

## Update Software %

There are two computers installed on the BlueROV2: a Pixhawk autopilot, and a Raspberry Pi 'companion' computer. Before proceeding, we will check that the software on both computers is up to date, and update the software if necessary.

These are the current software versions (updated 15 April 2019):

- Companion: **v0.0.17** (release notes (<https://github.com/bluerobotics/companion/blob/master/release-notes.txt>))
- ArduSub: **v3.5.4** (release notes (<https://github.com/ArduPilot/ardupilot/blob/master/ArduSub/ReleaseNotes.txt>))

## Companion %

Companion is the software that runs on the Raspberry Pi. To perform a companion software update:

1. Plug a \_fully charged\_ battery into the ROV and connect the tether to your computer.
2. Navigate to 192.168.2.2:2770/network (<http://192.168.2.2:2770/network>) in your browser and ensure that the ROV has access to a WiFi network. If you do not see a webpage at this address, you need to perform the update according to the instructions here (<http://discuss.bluerobotics.com/t/software-updates/1128>).
3. Navigate to 192.168.2.2:2770/system (<http://192.168.2.2:2770/system>). Click the button that says 'Update companion'. If you do not see this button, then the companion software is up to date.
4. The update process will take between 5 and 20 minutes depending on the Internet connection speed. Wait for the update process to complete.
5. When it completes, refresh your browser. The companion version should be updated, and the update available message should no longer appear.
6. If the update fails (usually due to a loss of internet connectivity), you will be warned that the ROV will reboot and to leave the battery plugged in. At this point, once you are able to refresh the webpage, it is safe to either power down the ROV or attempt the update again.

## ArduSub %

ArduSub is the software that runs on the Pixhawk autopilot. To perform an ArduSub software update:

1. Navigate to 192.168.2.2:2770/network (<http://192.168.2.2:2770/network>) and ensure that the ROV has an internet connection.

2. Navigate to 192.168.2.2:2770/system (<http://192.168.2.2:2770/system>). Click the button under the 'Pixhawk Firmware Update' section that says 'Stable'.
3. Wait for the update process to complete, and you are finished!

## Joystick/Gamepad Calibration 📌

Some joysticks require calibration before you can enable them for use with QGroundControl. If your joystick requires calibration, the **Joystick** tab on the **Vehicle Settings** page will be red, and you should follow these steps to calibrate your joystick. If your joystick does not require calibration, the **Joystick** tab will not be red, and you can skip this step!

1. Go to the **Vehicle Settings** page in QGroundControl, then click on the red **Joystick** tab in the sidebar on the left.
2. Ensure the 'TX Mode' selection is set to 3.
3. Click "Calibrate", then click "Next".
4. Follow the step-by-step instructions, move the sticks as indicated in the diagram in QGroundControl.

When completed, the **Joystick** tab will no longer be red, and the **Enabled** checkbox on the Joystick page should be checked.

## Button Setup 📌

The default button setup for the BlueROV2 is as shown in the image below:



(<https://bluerobotics.com/wp-content/uploads/2019/03/joystick-defaults.png?x62571>)

The button functions may be reconfigured in the **Joystick** tab on the **Vehicle Settings** page.

## Sensor Calibration 🔗

1. Go to the **Vehicle Settings** page in QGroundControl and select the red *Sensors* tab in the sidebar on the left.
2. Choose `Roll90` for the **Autopilot Orientation** selection.
3. Click on the *Accelerometers* and follow the instructions.
4. Click on *Compass* and follow the instructions.

When completed, the *Sensors* tab will no longer be red.

## Configure Motor Directions 🔗

The motor directions for the BlueROV2 must be configured prior to operation.

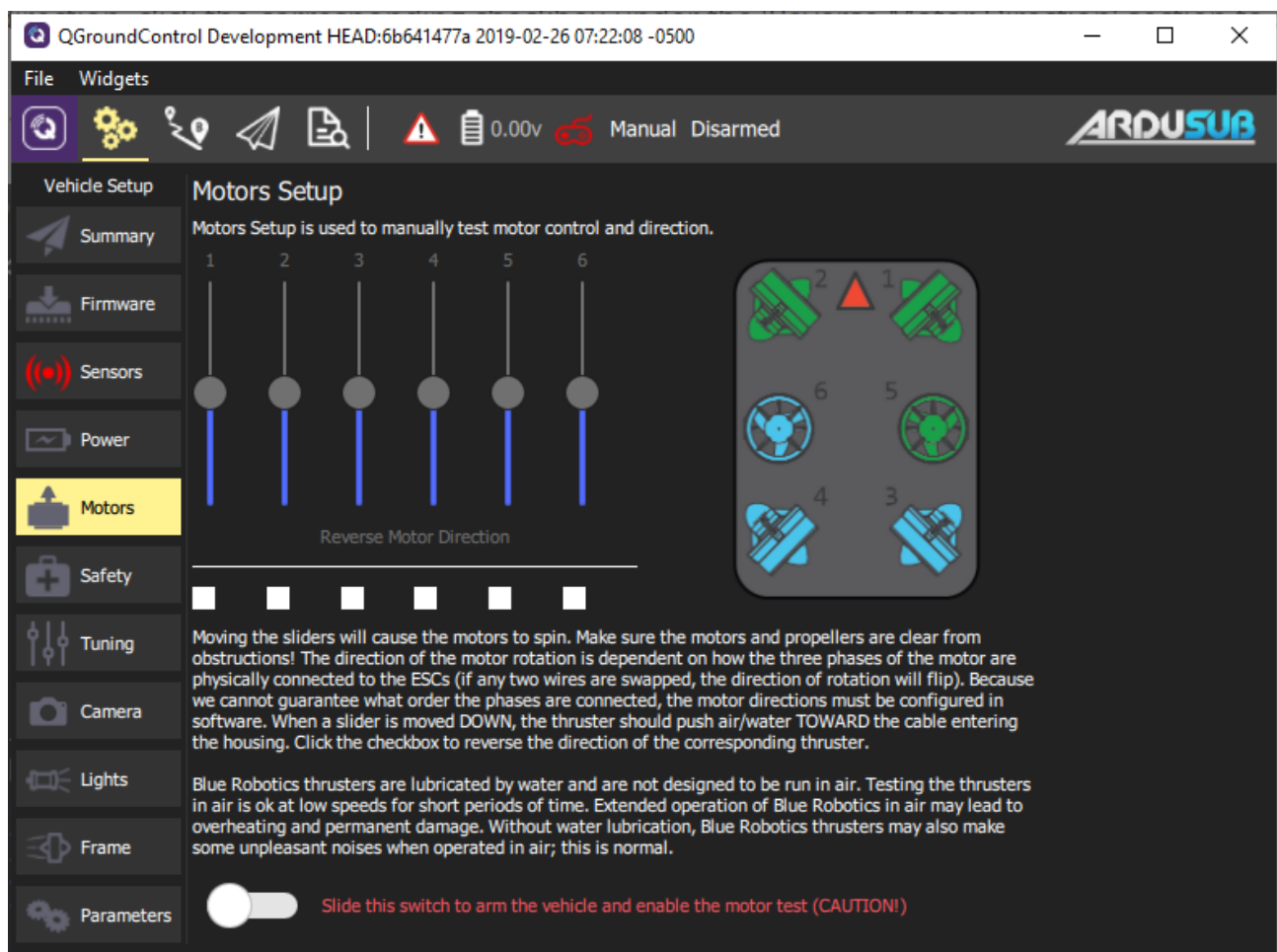


Be sure to keep all body parts and clothing clear of thrusters while the BlueROV2 is armed.



**DO NOT** run thrusters for longer than 30 seconds in air or you will wear out the plastic bearings.

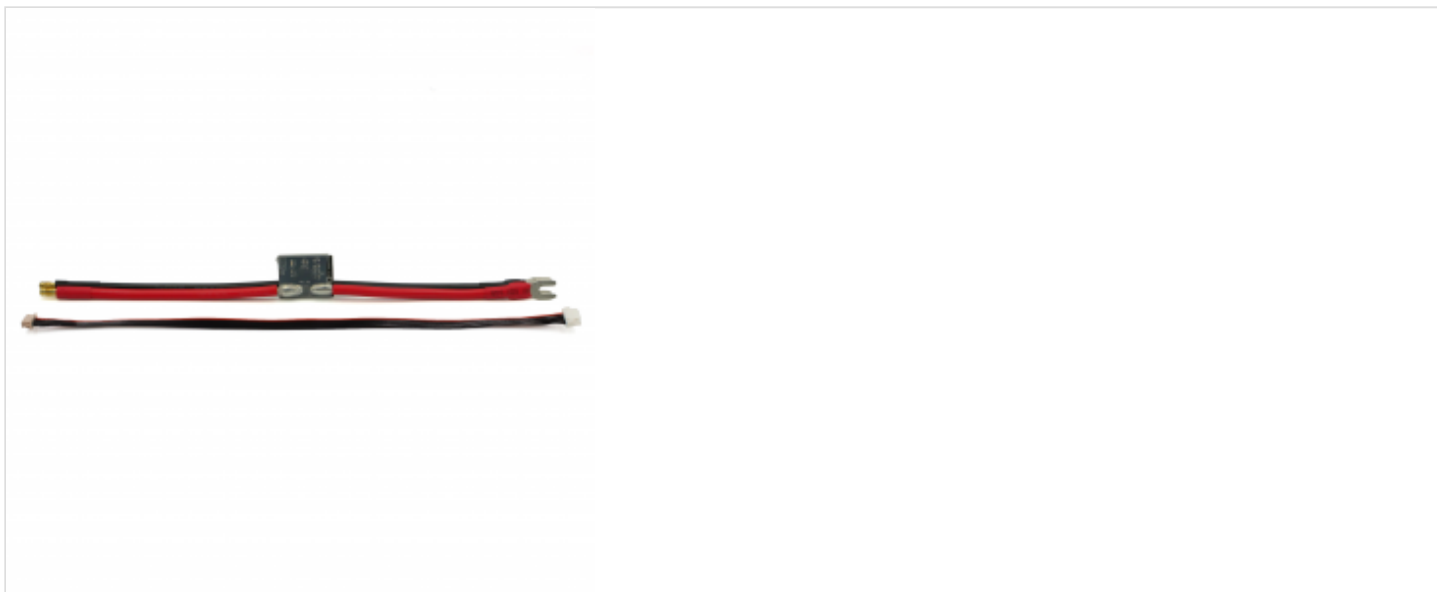
1. Go to the Vehicle Settings page in QGroundControl and select the *Motors* tab in the sidebar on the left.
2. Read and understand the instructions on the setup page.
3. Arm the BlueROV2 by clicking the switch on the page.
4. One at a time, move each slider, and make sure that the motor that spins is pushing air in the correct direction. If a motor is spinning in the wrong direction, click the corresponding checkbox under the 'Reverse Motor Direction' section to correct the motor rotation.
5. When you are finished with the setup, disarm the ROV by clicking the switch.



(<https://bluerobotics.com/wp-content/uploads/2019/03/brov2-standard-motor-directions.png?x62571>)

## Voltage and Current Measurement Setup %

Follow the respective guide for your Power Module (deprecated) or Power Sense Module (current).



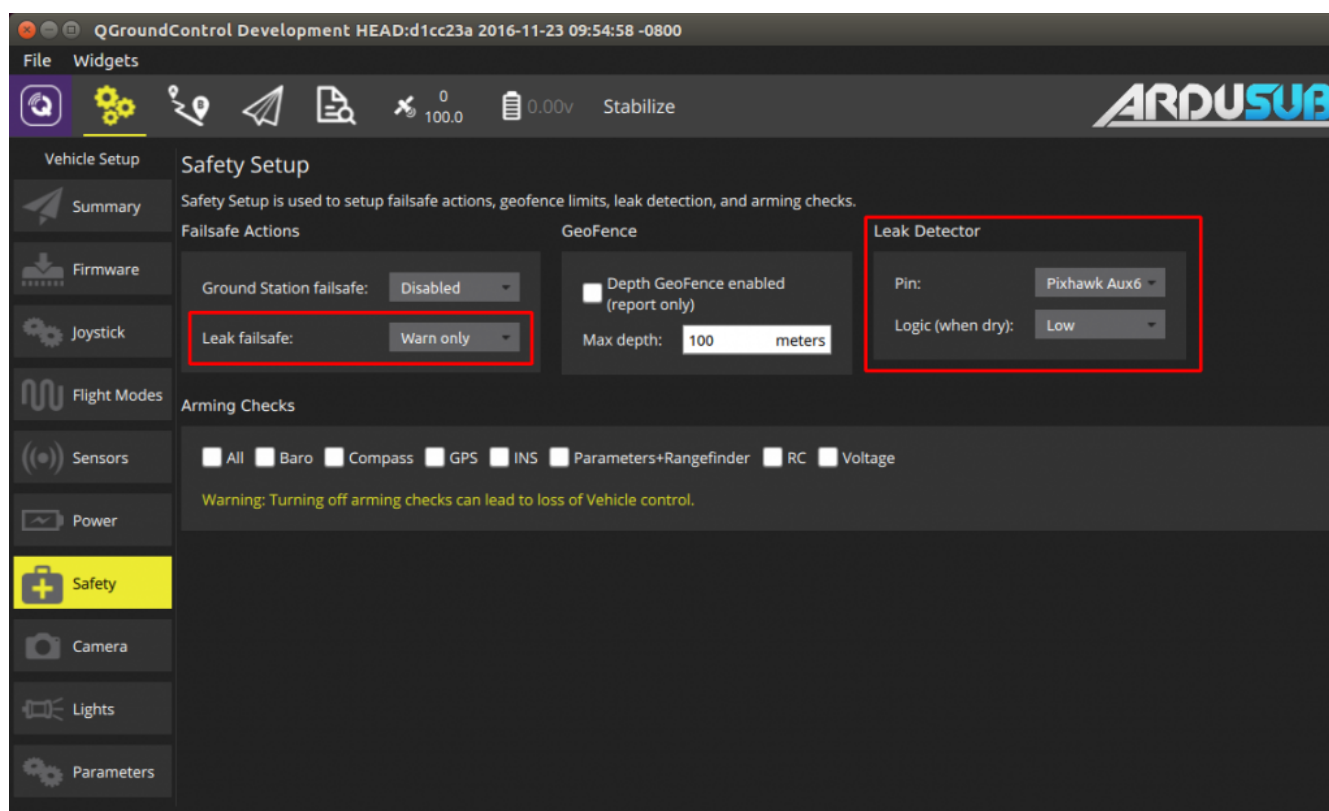
## Power Sense Module (PSM) Installation

(<https://bluerobotics.com/learn/power-sense-module-psm-installation/>)

Learn how to install and setup a Power Sense Module on your BlueROV2 or other underwater project!

## SOS Leak Sensor Setup ☞

In the Safety tab, select "Pixhawk Aux6" as the leak detector pin, and set the Logic when dry to "Low."



(<https://bluerobotics.com/wp-content/uploads/2019/01/sos-software.png?x62571>)

## To The First Dive! ☞

Your computer setup is now complete! Please see our Operation Manual to finish getting ready for your fi

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## BlueROV2 Operation

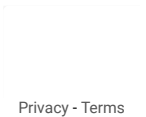
(<https://bluerobotics.com/learn/bluerov2-operation/>)  
Learn how to operate your newly built BlueROV2!

## Issue Reporting 🐛

We're always trying to make our documentation, instructions, software, and user experience better. If you're having an issue with anything, please report it so that we can address it as soon as possible! Here's where to do that depending on what's wrong:

- **ArduSub Issues:** For anything related to the ArduSub software that runs on the Pixhawk and controls the ROV, reports issues on the ArduSub Github Issues Page (<https://github.com/bluerobotics/ardusub/issues>). If you're unsure where your issue should be posted, you can report it here.
- **QGroundControl Issues:** For anything related to the QGroundControl software, joystick setup, video streaming, etc., please report an issue on the QGroundControl Github Issues Page (<https://github.com/mavlink/qgroundcontrol/issues>).
- **Documentation:** For anything related to the documentation and instructions here, please report an issue by submitting an e-mail to [support@bluerobotics.com](mailto:support@bluerobotics.com) (<mailto:support@bluerobotics.com>).

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