

Ikan Beholder Gimbal Calibration Guide v1.1

Although all gimbals are calibrated before being shipped, the accelerometer and gyroscope inside the gimbals are temperature sensitive and may require recalibration to local operating conditions. Should you find that your gimbal is tilting or drifting, please follow the steps below to recalibrate your gimbal.

The following items are required to properly calibrate your Gimbal:

- a. Ikan Gimbal – fully powered
- b. Camera
- c. Screwdriver – flat head
- d. Computer – Windows or MacOS
- e. Cable – USB to mini-USB

***Warning: gimbals can be permanently damaged if other settings not covered in this guide are changed. ***

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1.0 Camera Installation and Gimbal Balancing

Items Needed:

- Camera
- Ikan Beholder Gimbal
- Screwdriver – flat head

The gimbal cannot be properly calibrated if it is not balanced with a camera installed. To balance your gimbal, follow the steps that are outlined below.

Gimbal balancing steps:

Before installing the camera and adjusting the balance, remove the camera lens cover, attach the lens hood, and insert a memory card and camera batteries, as well as any other accessories. The camera should be fully ready to shoot.

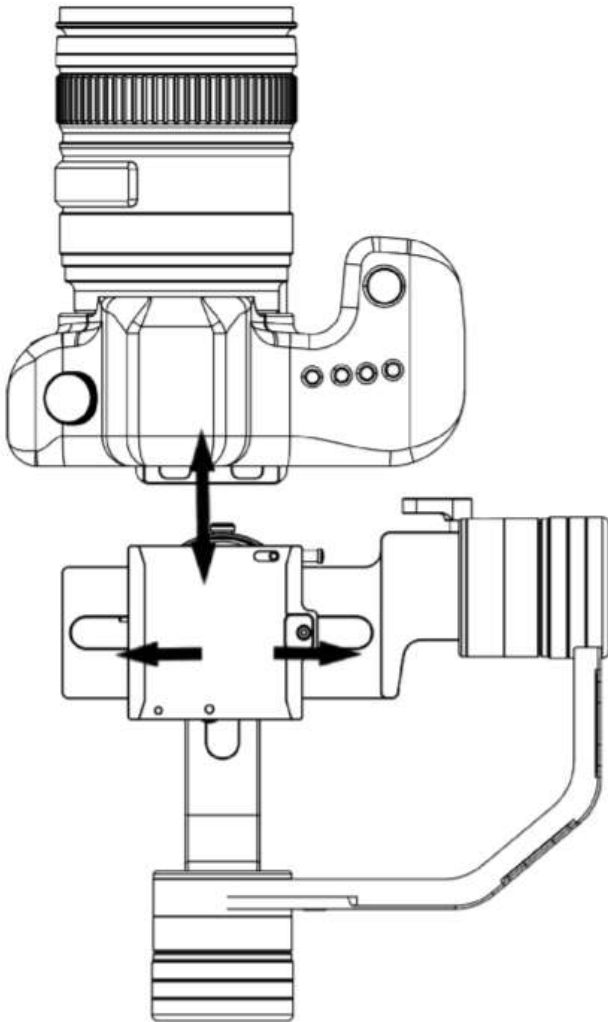
STEP 1: Mount the camera quick release

- Remove the quick release plate from the gimbal.
- Attach the quick release plate to the camera.
- Make sure the quick release plate direction is facing forward toward the lens.



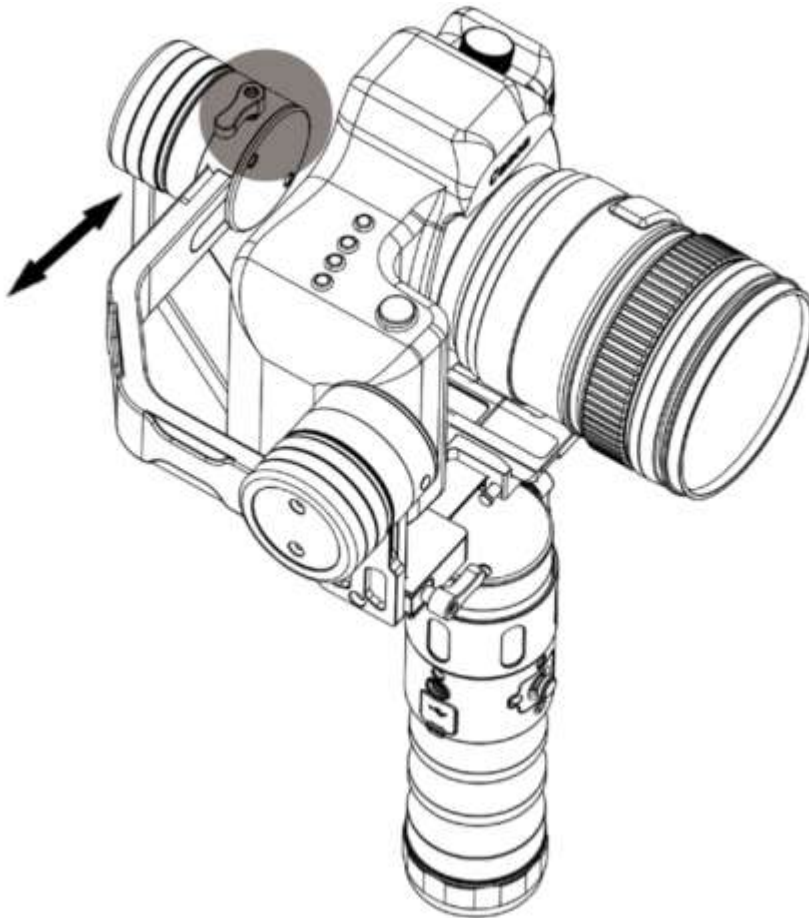
STEP 2: Install the camera on gimbal base

- Install the camera with quick release mounted into the gimbal bottom mount base.
- Slightly adjust the position of the camera into the base until you find a horizontal balance.
- Shift the camera as close to the pitch motor as possible. Use the base plate positioning if needed.
- Tighten the thumb screws.
- Use a screwdriver to tighten the 1/4"-20 quick release screw.



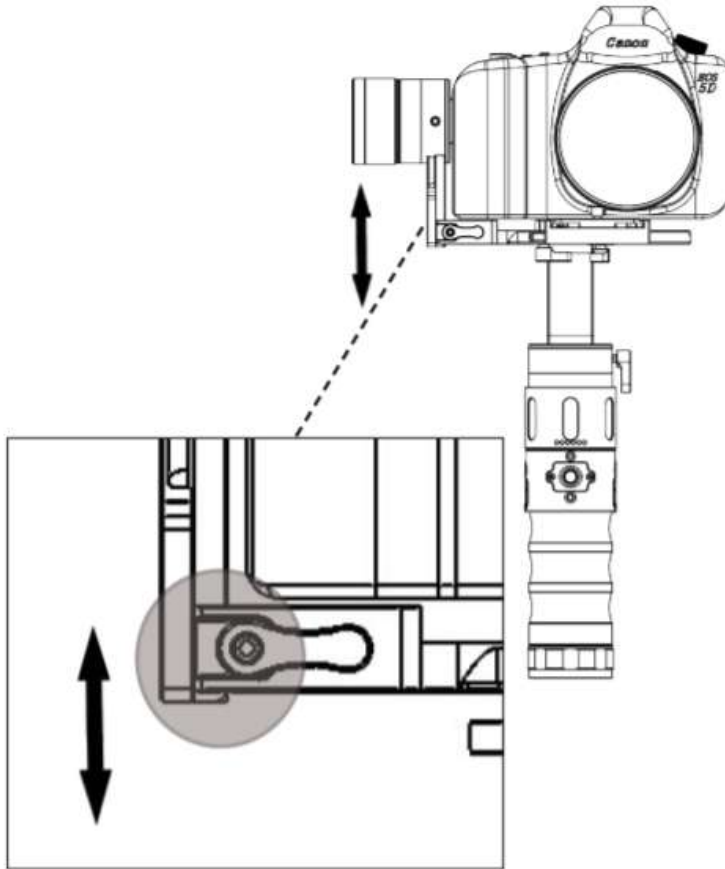
STEP 3: Adjust the gimbal roll – left and right balance

- Release the roll thumb M4 screw.
- Slide the roll arm left or right until the camera finds a balance position and doesn't lean left or right.
- In case more space is needed on either side, then go back to step 2.



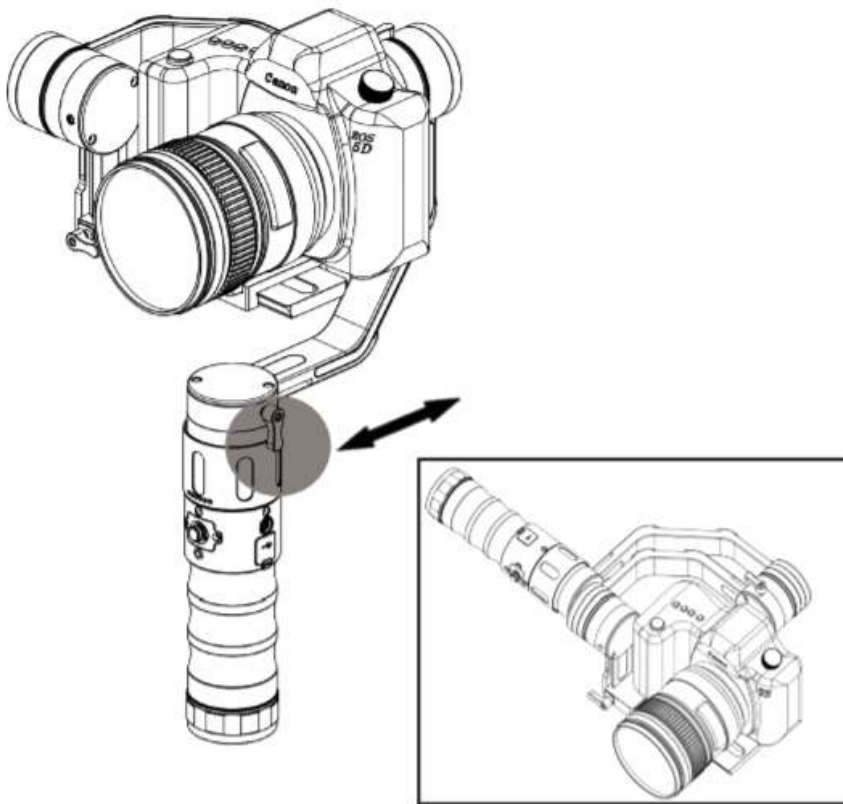
STEP 4: Adjust the gimbal pitch - up and down balance

- Loosen the camera plate M4 thumb screw to adjust the pitch level.
- Move the camera plate arm up and down, until the camera stays in place at any lens angle.
- Tighten the thumb screws.



STEP 5: Adjust the gimbal pan – forward and backward balance

- Loosen the pan motor left thumb screw.
- Tilt the gimbal handle 45 degrees forward.
- Move the pan arm to the left side or to the right side at 90 degrees and observe the direction it tends to move when released.
- If the pan arm tends to go up/backward, then the gimbal is front heavy: move the pan arm back slightly and repeat the side test.
- If the pan arm tends to move down/forward, it means the gimbal is back heavy: move the pan arm slightly forward and repeat the side test.
- When in balance, the pan arm should stay at any position around the handle when the handle is tilted forward.
- Tighten the thumb screws.



Additional Balance Related Information:

In-depth instructions on how to balance your gimbal are available in this video:

<https://www.youtube.com/watch?v=WJkMEaLff3A&t=1s>

2.0 Basic Gimbal Calibration

Basic on-board Calibration:

Before attempting advanced recalibrating with the PC software, balance your gimbal using the on-board calibration features.

Basic Calibration:

Step 1:

- Power on gimbal
- Place on flat surface
- Hold the “MODE” button for 6 seconds

This will activate the gimbal’s built-in basic calibration that will fix most tilting problems.

Step 2:

- Attempt to operate gimbal normally

If you are still having problems after the basic calibration, please follow the rest of the guide.

Advanced Calibration:

Items Needed:

- Camera – 4.5 pounds max including lens
- Gimbal – EC1
- PC (Mac or Windows)
- Cable – USB to mini-USB

Do not plug your gimbal into your computer until you download and install the drivers for your operating system

Please make sure the gimbal is **balanced with a camera** before performing the calibration operation.

3.0 Software Installation:

***Warning: gimbals can be permanently damaged if other settings not covered in this guide are changed. ***

1. Download and install the CP210x USB to UART driver for your operating system:

<https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

2. Download and unzip the latest stable SimpleBGC software:

<https://www.basecamelectronics.com/downloads/32bit/#latest>

3. Make sure that Java is installed on your computer:

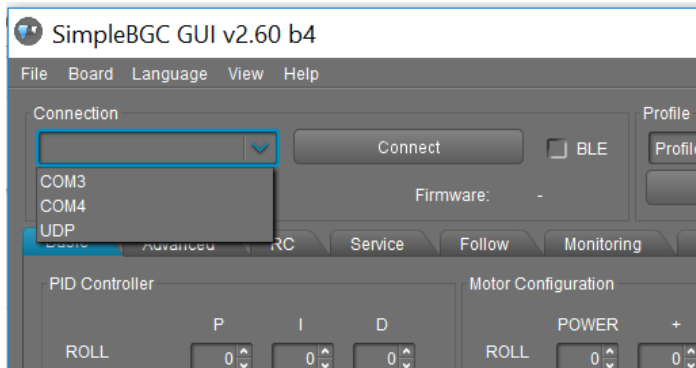
<https://java.com/en/download/manual.jsp>

4. Locate the folder where you unzipped the SimpleBGC software. For Windows, use the file **SimpleBGC_GUI.exe**. For Mac OS, use **SimpleBGC_GUI.jar**. Run the software and plug in your gimbal using the mini-USB port on the gimbal to connect to your computer.

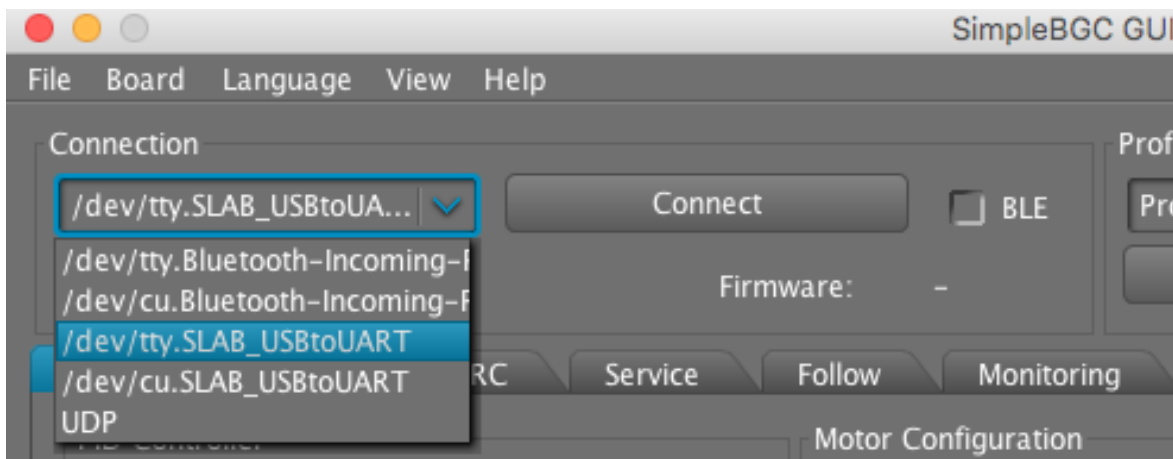


(Mini-USB port)

Windows - If the drivers were installed successfully in the drop-down menu in the Connection section, you should be able to see a COM option. An easy way to figure out which COM is being used for the gimbal is to keep the drop-down menu open and unplug the gimbal to see which COM option disappears. Select the COM number for your gimbal and press **“Connect”**.

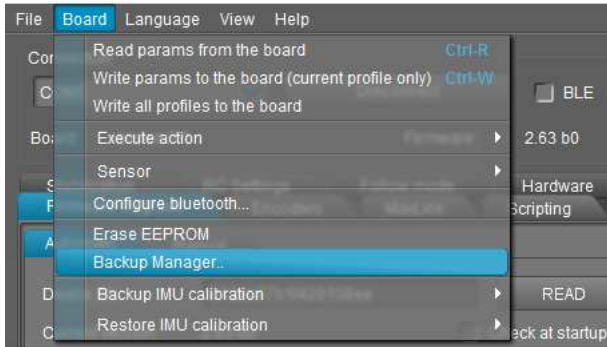


Mac OS – In the drop down box menu, select `/dev/tty.SLAB_USBtoUART` and press **“Connect”**.

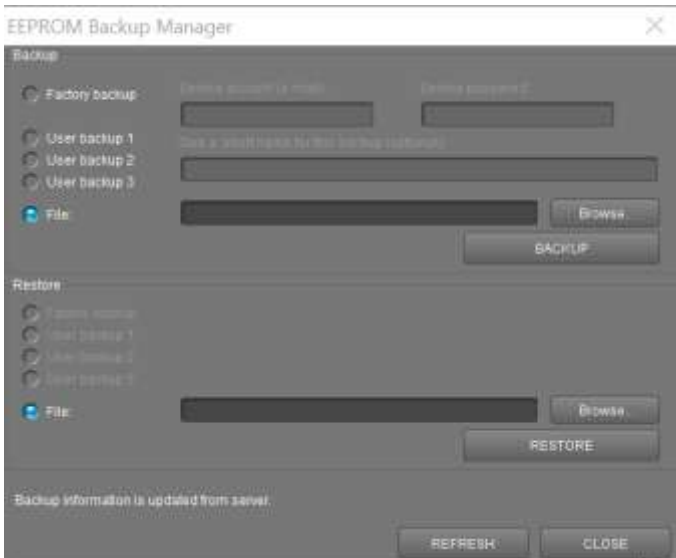


4.0 Backing Up The Gimbal Settings:

1. Select the **Backup Manager** inside the **Board** drop down.



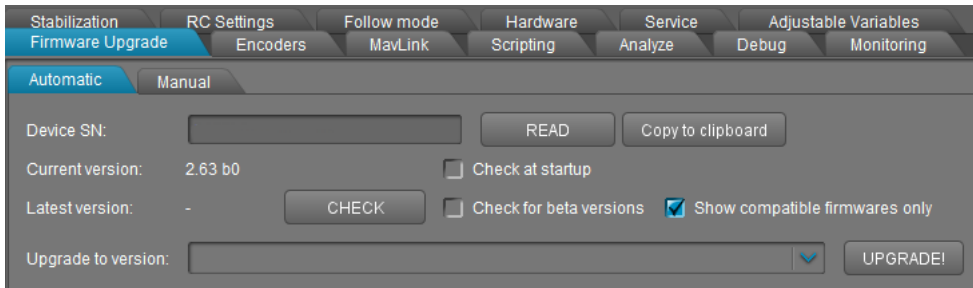
2. Press **“Browse”** button to set the file location and file name. Press the **“Backup”** button to save your backup file.



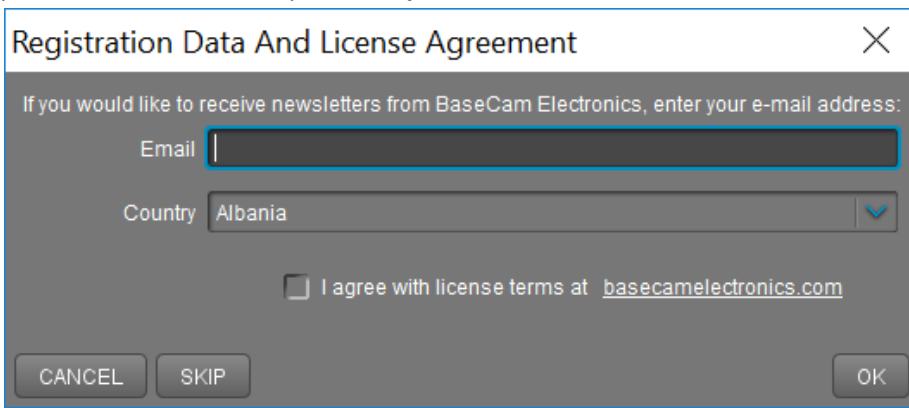
3. Should anything happen during your fine tuning process, you can now restore your gimbal to factory settings. To restore your gimbal, select the **“Browse”** button and locate your saved backup file. Press the **“Restore”** button to restore your backup.

5.0 Upgrading Firmware:

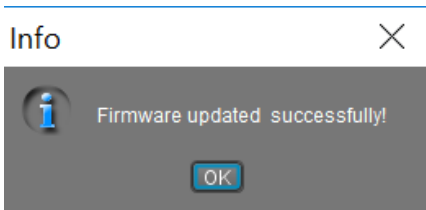
1. Navigate to and select the Firmware tab



2. Make sure the option “Show compatible firmwares only” is checked and the “Check for beta versions” is **NOT** checked.
3. If your current version is a lower number than the latest version, press the “**Upgrade!**” button.
4. Make sure to keep your gimbal plugged into the computer and do not unplug it during the upgrade process. On this screen press “**Skip**”.



5. Your gimbal is finished upgrading when you see the screen below.

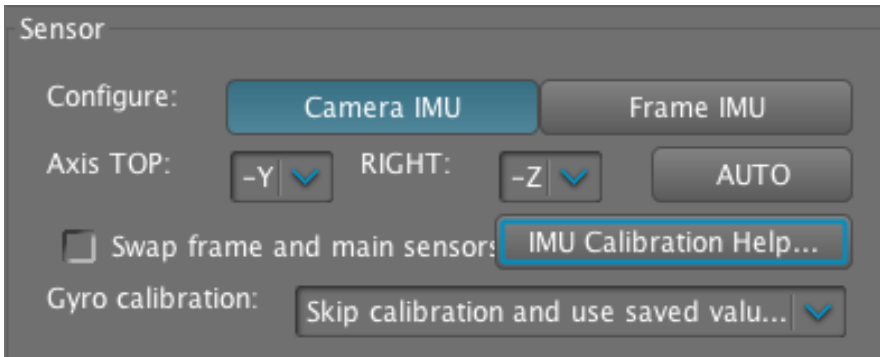


6.0 Calibrating Gyroscope and Accelerometer:

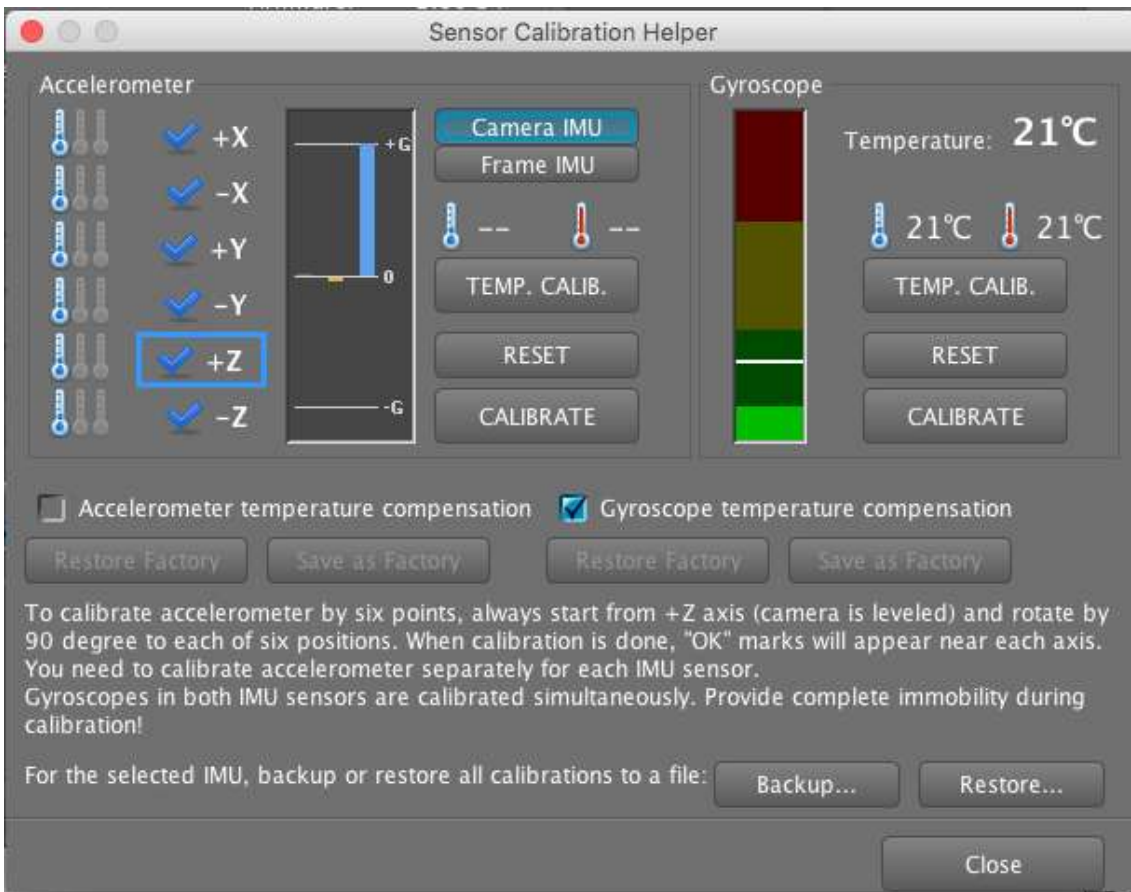
1. Locate and select the Hardware tab



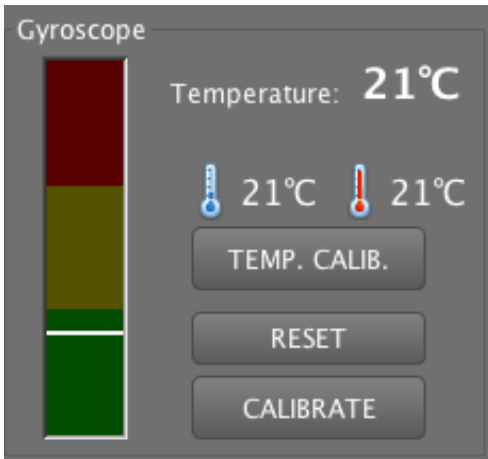
2. Select the "IMU Calibration Helper" button in the Sensor section.



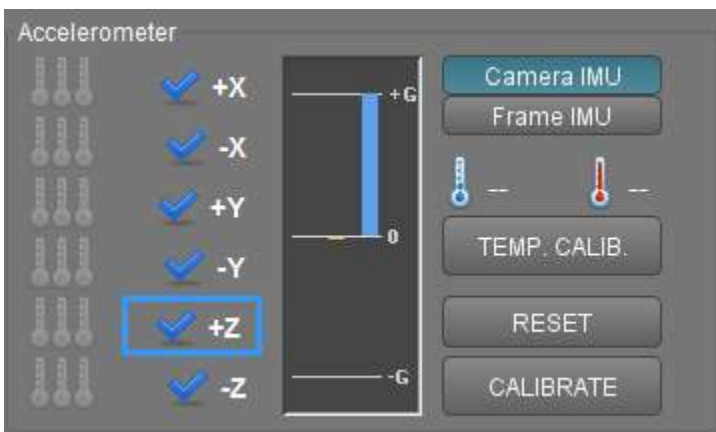
3. This will bring up the follow screen:



- Press **“Reset”** under both Accelerometer and Gyroscope sections. Under the Gyroscope section, you’ll see a three colored bar graph. Make sure the gimbal is set on a flat steady surface. Once the gimbal is steady with nothing touching or moving it, the white bar should fall to the green section. Without touching the gimbal or moving the surface it’s on, press the **“Calibrate”** button when the white bar is in the green section.



- Next we’ll move to the Accelerometer side.



Here you will set the camera facing six different directions, +X, -X, +Y, -Y, +Z, -Z and press **“Calibrate”** once the camera is steady in the corresponding position. Once you’ve successfully positioned the camera in the correct position, the program will make a click sound and highlight that side with a blue rectangle. Depending on if your gimbal has a straight arm or angled arm, the positioning of +X and -X are different. Below are pictures demonstrating the correct positioning of the camera and gimbal arm. The straight arm gimbal is listed first, followed by the angled arm pictures.

Straight Arm Gimbal (Pictures shown are the EC1 with a Sony A7S)

- a.  (Side motor facing down)



- b. -X (Side motors facing up)



- c. -Y (Camera lens facing up)

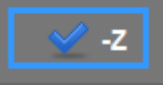


- d. +Y (Camera lens facing down)



- e. +Z (Screen facing back motor)



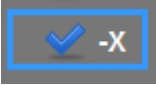
f.  (Camera lens facing back motors)



Angled Arm Gimbal (The picture shown is the DS2-A with a Sony A7S)

- g. +X (Side motors flat on the surface)



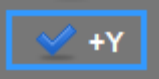


h. (Side motors facing up while on a flat surface)



- i. -Y (Camera lens facing up)

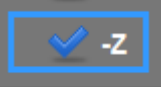


- j.  (Camera lens facing down)



- k. +Z (Screen facing back motors)

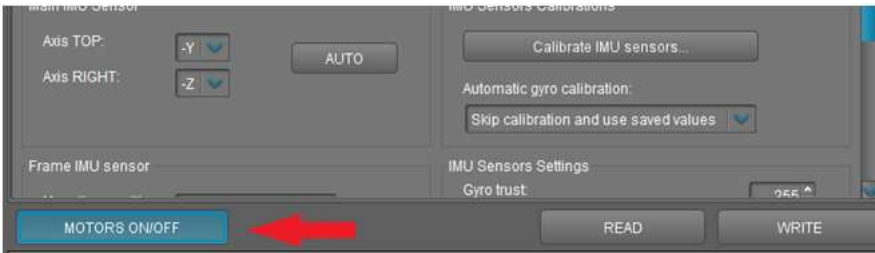




- I. (Camera lens facing back motors)



- After calibrating all 6 directions, close out of the Sensor Calibration Helper. Toggle the motors back on by pressing the **“Motors on/off”**. The motors are on when the button is highlighted in blue.



- Turn the gimbal off and then back on. Your gimbal is now calibrated.

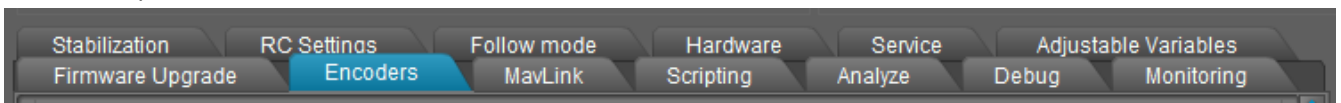
7.0 Calibrating Encoders

The encoders and magnets inside the gimbal function together to keep everything stabilized. However, sometimes in usage or shipping the gimbal is bumped and the encoders need to be re-calibrated. If you notice your gimbal drifting, jerking randomly, or spinning, calibrating your encoders should fix the issue.

- If your gimbal is spinning out of control, make sure to turn the motors off by pressing the **“Motors ON/OFF”** button. The motors are off when it is no longer highlighted in blue.



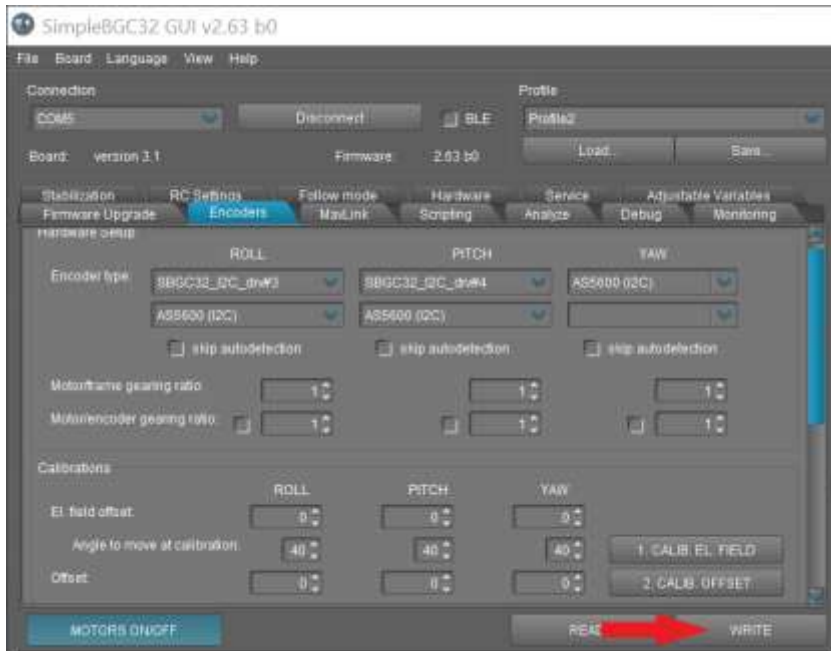
- Locate and press the Encoders tab.



- Place the gimbal on a flat level surface and change the settings that are highlighted with a yellow box in the image below. Make sure to only change the values of the items highlighted.



- After the values have been changed, press the **“Write”** button.



- If you turned off your motors previously, turn them back on before proceeding. Locate and press the **“1. Calib. El. Field”** button. You should hear a series of beeping noises, while your gimbal motors will automatically move. When the sound and gimbal stops, the calibration is finished.
- Next, we’ll need to calibrate the offset. The calibration process is different on this depending if you have a straight arm or angled arm gimbal.
 - Straight Arm Gimbal
 - Place the gimbal on a flat level surface.
 - Either manually or with the joystick, align the back motor arm with the LCD display.
 - Press the **“2. Calib Offset”** button
 - Angled Arm Gimbal
 - Either manually or with the joystick, align the back motor arm with the LCD display.
 - Tilt the gimbal forward so that the back motor is perpendicular to the flat surface. Make sure that the back motor arm is still aligned with the LCD display after tilting forward.
 - Press the **“2. Calib Offset”** button



8.0 Frequently Asked Questions (FAQs)

How do I balance my gimbal?

You can follow our guide on page 2 or alternatively you can watch our video for more in depth instructions.

<https://www.youtube.com/watch?v=WJkMEaLff3A>

What if I mess up my settings while following the guide?

Before doing any changes to your gimbal, always make sure to back up your gimbal. Each gimbal is unique, so make sure to follow the instructions on page 9.

How do I fix my gimbal's horizontal tilt?

Many times a basic calibration will fix most tilting issues. Basic calibration instructions are on page 7. If you still find that your gimbal is not level, follow the instructions on calibrating the gyroscope and accelerometer on page 11.

I've connected my gimbal to the SimpleBGC software, but it's not recognizing my gimbal. Why?

Make sure that you have installed the correct driver for your operating system.

<https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

My gimbal is spinning or drifting. What's wrong with my gimbal?

In this situation, calibrating your encoders will solve the issue. Instructions for calibrating the encoders are on page 25.

Can I update the firmware on my gimbal?

If you find that your gimbal is working fine, we recommend that you keep your current firmware. However, if your gimbal needs calibrating, you can upgrade your firmware following the instructions on page 10. Always make sure to back up your gimbal before upgrading the firmware.