

**July, 2015** - This Document Contains Basic PID and Profile Settings for the CAME-TV 7800 Gimbal using Firmware version 2.43b9. Using these PID values with other firmware versions is not guaranteed since PID values are highly dependent on the firmware version of the gimbal system.

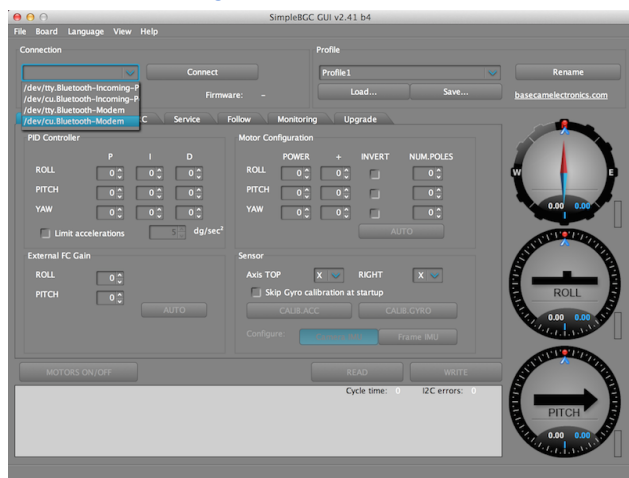
## IMPORTANT NOTES:

- 1) It is not always a good idea to download Profiles that have been uploaded on the Internet. Profiles are more than just PID values, and will change other settings in your Gimbal that may be different (motor invert, sensor orientation, follow modes, RC settings, etc). We recommend changing the values manually in each section, which is why we are providing the values through these instructions.
- 2) Before changing any values on your Gimbal, it is always a good idea to record your previous settings so that you can revert if needed.
- 3) Make sure you have a fully charged Laptop so that your system doesn't turn off during this process.
- 4) Make sure you have the proper **DATA USB Cable** connected to the Gimbal and your Computer. Some USB cables are designed only to charge devices, and may not be wired to transfer data. If you cannot connect to your gimbal, try a different USB Cable.
- 5) At this point your Camera + Lens should be balanced properly on the Gimbal. When standing behind the camera, the ROLL Motor should be on the left side of your camera (not right side). If the ROLL Motor is on the right side of your camera, you have mounted it backwards. [Watch Tutorial: Balancing Camera on 7800 Gimbal](#)

## Download Software and Connect to Gimbal

To connect to your Gimbal from a Mac or PC Computer, you must first download the proper software. If you are on a MAC computer, you will also need to download drivers. Please read this article about downloading and installing the software.

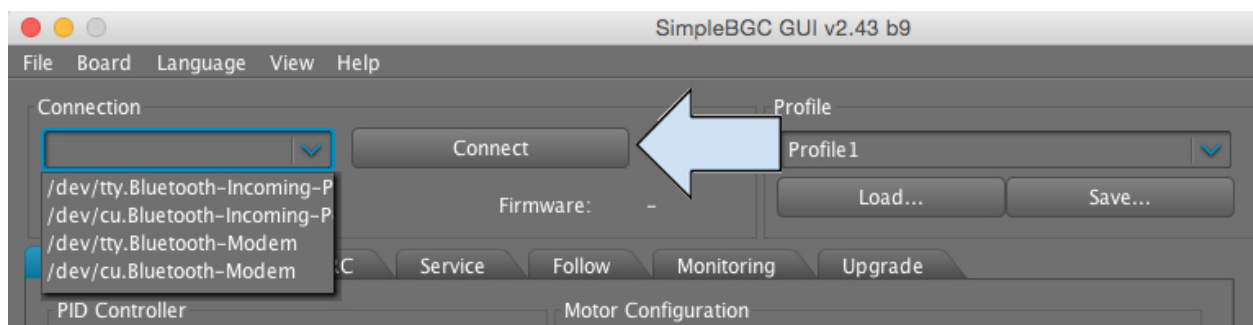
<http://cametvblog.com/how-do-i-download-install-and-launch-simplebgc-software-on-mac-osx/>



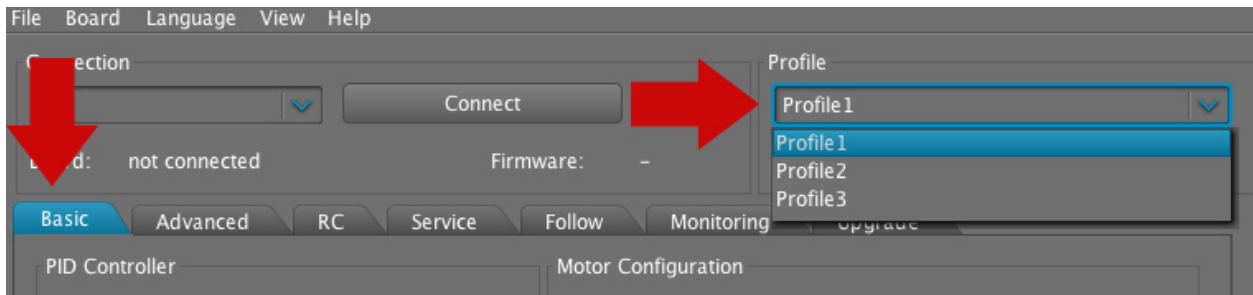
Before connecting to your Gimbal, ensure the **POWER SWITCH IS TURNED OFF**. Plug one end of the USB Cable to the USB port on the top of the 7800 power box, and the other end to your Computer.



Next Launch the software on your computer, Select the proper port, and click on the Connect Button. **Reminder:** *Your 7800 Gimbal running firmware 2.43b9 should still be powered OFF.*



Once you are connected, make sure you are on the Basic Tab and have Selected Profile1.



## PID Controller Values

Enter these values under PID Controller and then **Save the Settings by clicking the WRITE Button** on the lower left corner of the application.



Enter these Values for **Motor Configuration** and **NUM.Poles** then **Save the Settings by clicking the WRITE Button** on the lower left corner of the application.

	POWER	+	INVERT	NUM.POLES
ROLL	205	50		22
PITCH	180	50		22
YAW	190	50		22

AUTO

**Notice how we do not show values for INVERT.** These settings are unique to your gimbal which is why we do not recommend downloading and installing Profiles from other systems. If this setting is different from how your gimbal was configured then the system would be unstable.

If you believe that these settings have been lost since the original Configuration, you will need to reset these values by following these procedures:

**Tutorial:** [How to Check for Invert Options on Gimbal Motors](#)

## Setting up Sensor Orientation

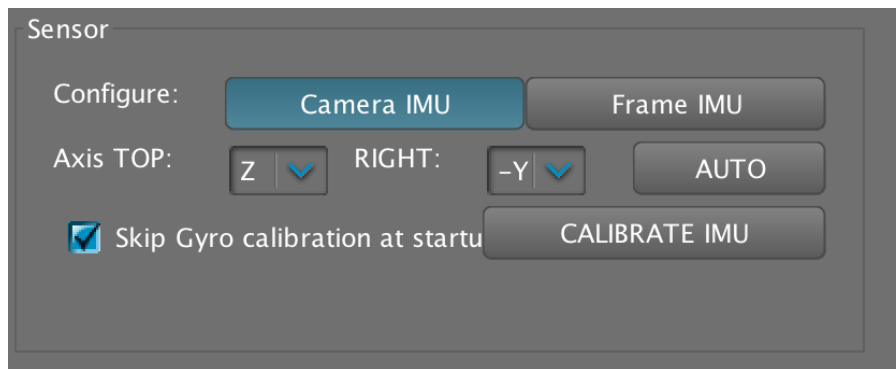
There are two sensors on the CAME-TV 7800 Gimbal. One is located above the camera frame, and the other on the vertical frame. These sensors will determine Right from Left as well as Top and Bottom. As your camera moves, the sensors will track the camera's position. If the sensor is setup incorrectly the gimbal will be confused and cannot stabilize the camera properly.

For the CAME-TV 7800 Gimbal setup the proper Sensor Orientation for both Camera IMU and Frame IMU.

First click the Camera IMU Button and then change the values to

**Axis TOP: Z**

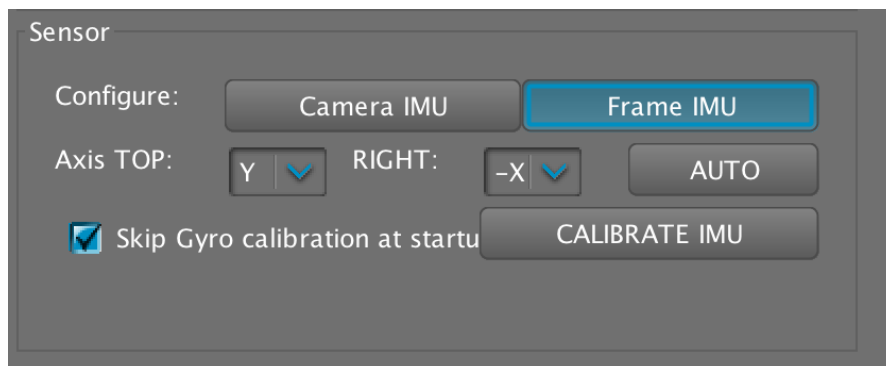
**RIGHT: -Y**



Next click the Frame IMU Button and change values to

**Axis TOP: Y**

**RIGHT: -X**



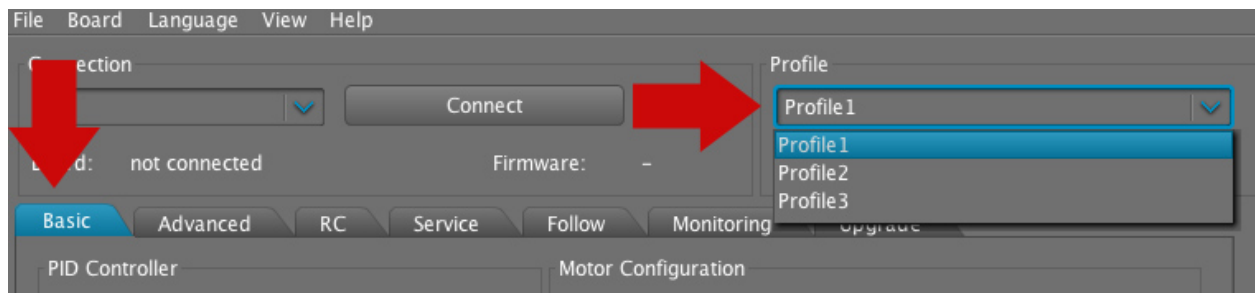
After making these changes, make sure to **Save the Settings by clicking the WRITE Button.**

**To verify if these settings are correct follow this**

**Tutorial: [Checking Sensor Orientation](#)**

**Congratulations! You've just configured the Default Settings for the CAME-TV 7800 Gimbal for Profile1. Now it's time to go back through the entire Process for Profile2 and Profile3.**

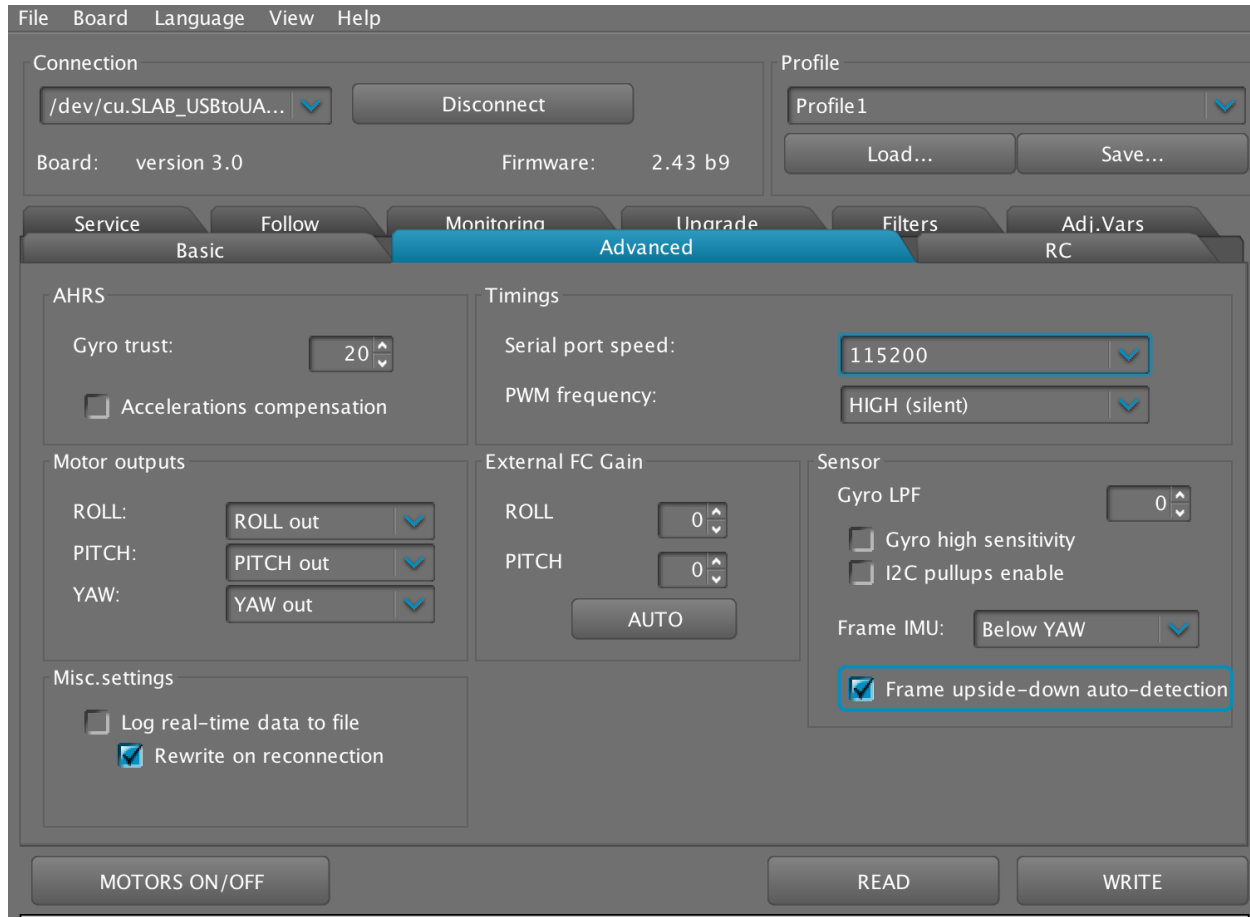
Use the drop down menu and now Select Profile2 and repeat all of the settings so that they match up exactly. Then select Profile 3 and repeat the same steps. *[Profile4 and Profile5 are not used on the 7800. These are reserved for Service Modes shown later in this document].*



If you plan on tuning your PID settings in the future, remember that you need to replicate these settings across every Profile that you plan on using. Once you are done setting the Basic Values for Profile1, Profile2, and Profile3 let's move on to the Advanced Tab.

## Advanced TAB SimpleBGC GUI v2.43 b9 for CAME-TV 7800 Gimbal

Please configure the values according to the screenshot below. Make sure to **Save the Settings by clicking the WRITE Button** after you've made the changes!



**Notes:** The **Frame IMU** settings must be set to **Below YAW**. If this setting is disabled, you will not be able to setup the Sensor Orientation under the Basic Tab (beginning of this document).

By selecting the **Frame upside-down auto-detection** option, you can invert your gimbal by first powering the entire system off, rotate the gimbal frame to inverted mode, and then powering the system back on.

**Inverted Mode:** Be careful not to over rotate your gimbal frame as there are many wires that run through the system. If you plan to use the Inverted Mode on your 7800, you should properly rotate the system back to normal (do not exceed 360 degrees). If you feel any tension during rotation, it's possible the internal wiring is starting to tangle. Try rotating the camera gimbal frame the opposite direction until the tension is gone.

**Watch Tutorial:** [How to Use Inverted Mode on Gimbal](#)

## Configure RC Tab Settings - JoyStick Control Options

The screenshot displays the 'RC' tab settings in a software application. The interface is divided into several sections:

- RC\_ROLL pin mode:** Set to 'Normal (PWM or Analog)'. A red arrow labeled '1' points to this dropdown.
- RC Control:** A table of settings for ROLL, PITCH, and YAW. A red arrow labeled '2' points to the ROLL speed mode (set to 'SPEED'). A red arrow labeled '3' points to the ROLL speed value (set to '8'). A red arrow labeled '4' points to the ROLL LPF value (set to '15'). A red arrow labeled '5' points to the YAW inverse checkbox (unchecked).
- RC Sub-Trim:** A section with trim values for ROLL, PITCH, and YAW, an Expo curve, and a Deadband around center. A red arrow labeled '6' points to the graph showing a linear relationship between the joystick input and the gimbal output.
- PWM Output:** Servo1, Servo2, Servo3, and Servo4 are all set to 'disabled'. PWM rate is set to 50 Hz.
- Other settings:** Analog joystick auto-detection is checked for ADC1 and ADC2. Limit accelerations is set to 200 dg/sec<sup>2</sup>.

Buttons at the bottom include 'MOTORS ON/OFF', 'READ', and 'WRITE'.

(Continue to next page for additional information about these options...)

**Save the Settings by clicking the WRITE Button** after you've made the changes!

**Tutorial: [Adjusting RC Joystick Settings for Gimbal](#)**



## RC Options Explained

- 1) The Joystick on the CAME-TV is a 2-Axis Joystick. This means it can control movements from either Pitch, Roll, and YAW. The default setting controls Pitch (tilt up | down) and Yaw (pan left | right). If you want to change these settings to control the ROLL of the camera, you can do this [here](#).
- 2) The **MIN ANGLE and MAX ANGLE** is used to control the maximum allowed camera position when using the Joystick. The camera will automatically stop according to these angles. We recommend using -45 and +45 degrees. If you feel you want to control more or less camera angle through the Joystick, you can make the changes [here](#).
- 3) Speed is how fast the camera movement is when the Joystick is used. A higher Value will cause the camera to move quickly when the Joystick is applied. A lower value will allow the camera to move slowly. If you want to change the speed of your camera movement when using the Joystick, you can make the changes [here](#).
- 4) LPF is used to control the responsiveness of the Joystick controls.  
**HIGHER LPF VALUE** will delay the camera movements after the Joystick is applied. The camera will also take longer to come to a complete stop after Joystick. It will basically 'ramp up speed' during the start of camera movement and 'ramp down speed' at the end of camera movement.

**LOWER LPF VALUE** will have immediate camera response. The camera will move immediately when the Joystick is applied, and will come to a sudden stop after Joystick application. This causes a 'jerky motion' which does not appear smooth, but is better for tracking very fast subjects.

- 5) **INVERSE** is used to change the direction of Joystick Controls. This is used because Joysticks can be mounted in different positions. If you move the Joystick Up and your Camera camera points down, you can change this with the Invert Option for Pitch (Tilt). After making this change, when you point your Joystick Up the Camera will point Up (instead of down).

**TIP:** If you apply Joystick UP and the camera pans Left or Right, and when you apply Joystick Left the camera Tilts Up, then you can swap these controls under the first setting (see Arrow 1).

- 6) The **RC Sub-Trim** is used to calibrate the Joystick. This is an electro-mechanical control surface that over time may need calibration for it's true Neutral Position. The most common problem is slow 'drifting' of camera position. When the Joystick is not calibrated properly, the gimbal believes that someone is applying Joystick commands and starts to move. To calibrate your Joystick, ensure that your Joystick is in it's true neutral position. Make sure it's not binding or stuck, and is centered as best possible. Then simply click on the Auto button and the values will automatically be entered. Or you can try to change these values manually to correct drift issues.

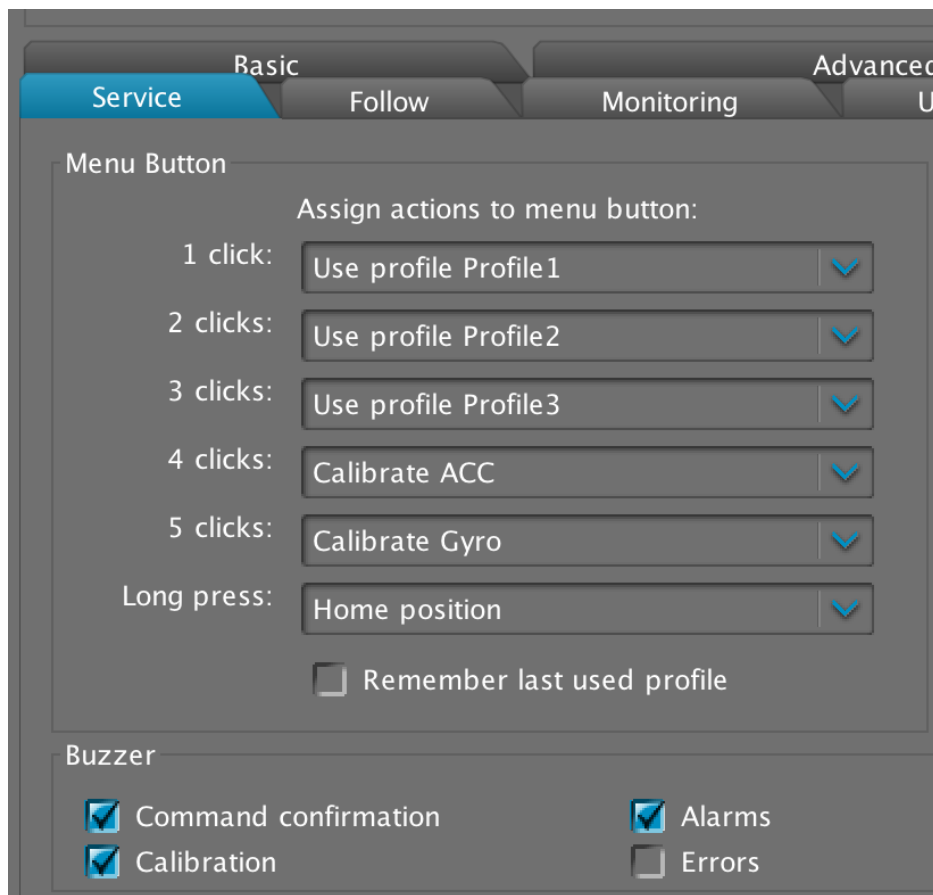
**[Save the Settings by clicking the WRITE Button](#) after you've made the changes!**

After making your changes, leave the RC TAB open and toggle through Profile1, Profile2, and Profile3 to make sure your RC TAB Settings are consistent under each Profile.

## Configuring Service Modes

Service Modes are used to assign button clicks to various Gimbal Operations. On the CAME-TV 7800 you can click the Joystick by pushing down on the center of the stick to operate these Service Modes. By default we have the following modes set.

- 1 Click: Switch to Profile 1
- 2 Click: Switch to Profile 2
- 3 Click: Switch to Profile 3
- 4 Click: Calibrate ACC (Calibrate sensors. Must hold camera and gimbal level and square when using this option)
- 5 Click: Calibrate Gyro (Calibrate Gyros. Must hold camera and gimbal level and square when using this option)
- Long Press: Home Position (returns camera position back to last Calibration of Sensors)



For more in depth on Service Modes

Tutorial: [How to Use Gimbal Profiles and Service Modes](#)

## Configuring Profile1 | Profile2 | Profile3 on CAME-TV 7800

There are three main profiles set in the CAME-TV 7800 Gimbal. You can change to different Profiles when operating the Gimbal by pressing the Joystick down into the center of itself.



One Click will switch to Profile1. Two Clicks will switch to Profile2. Three Clicks will switch to Profile3.

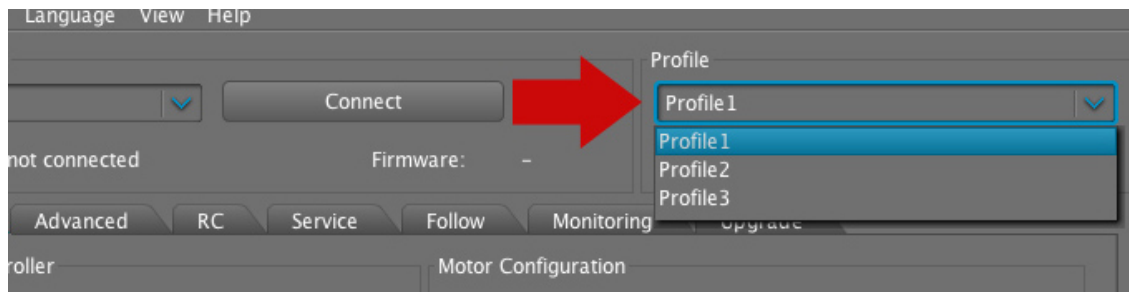
**Profile1** will enable Follow Modes for both Pan and Tilt (Yaw and Pitch).

**Profile2** will enable Follow Mode ONLY for PAN (Yaw) and will Disable Tilt (Pitch).

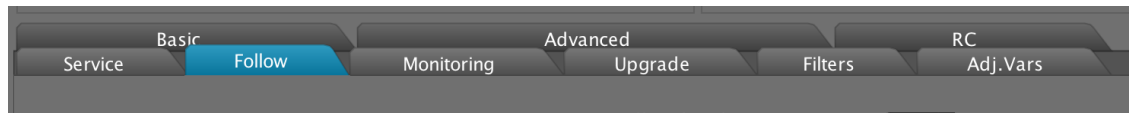
**Profile3** will Disable All Follow Modes. The Camera heading will stay constant.

Basically each Profile is an exact copy of itself, except for the Follow Modes. Each profile has a different Follow Mode, and we can toggle between each Profile depending on which Follow Mode we need to use.

To set these Profiles up differently, first use the Drop Down Menu and switch to Profile1

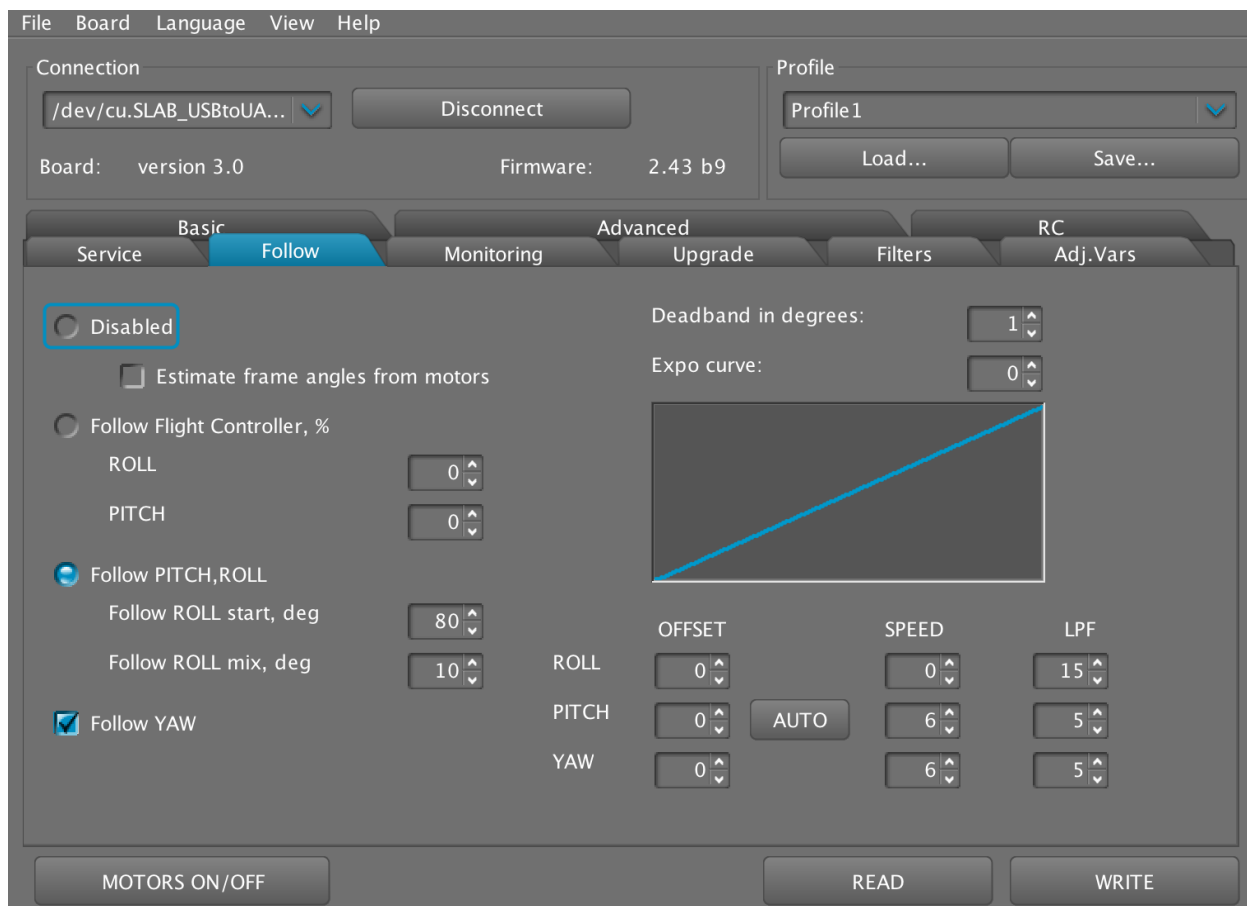


Now select the Follow Tab.



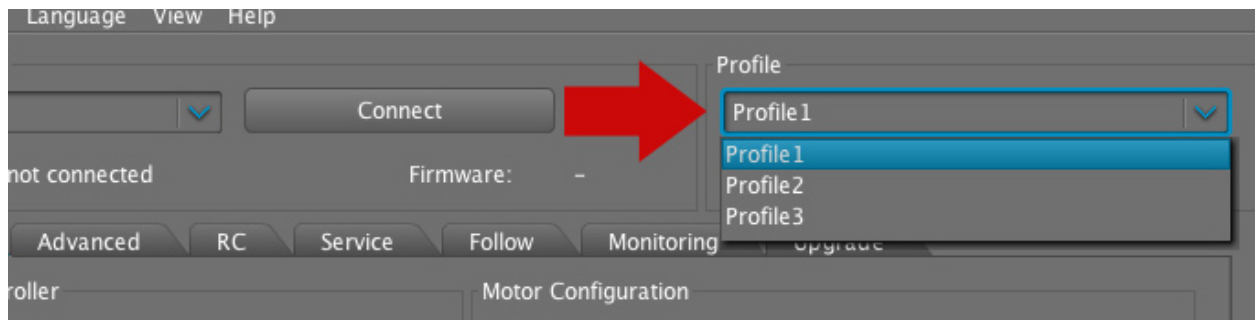
## For Profile1 use the Values Below

In this setting you'll notice we have Follow Pitch and Follow YAW selected. Remember in Profile1 the camera Follows both Pan and Tilt.



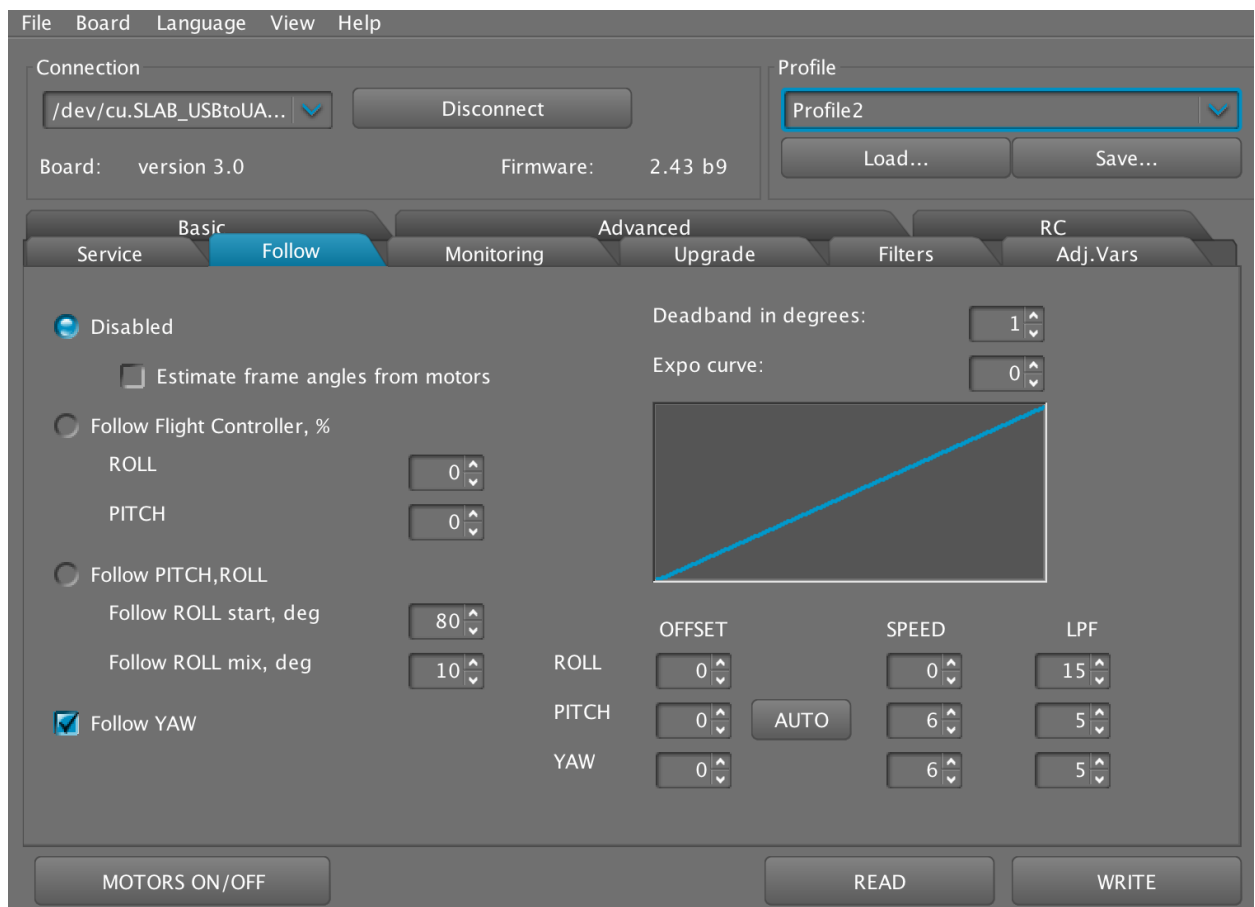
**Save the Settings by clicking the WRITE Button** after you've made the changes!

After saving your changes we need to use the drop down menu and select Profile2.



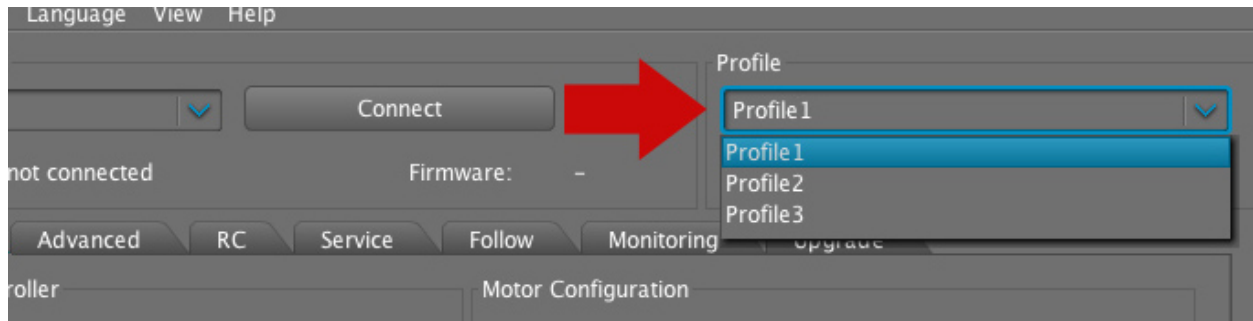
### For Profile2 use the Values Below

Notice that we have only Follow YAW selected (not Pitch). Remember that in Profile2 the gimbal will only Follow panning movements (not tilt).



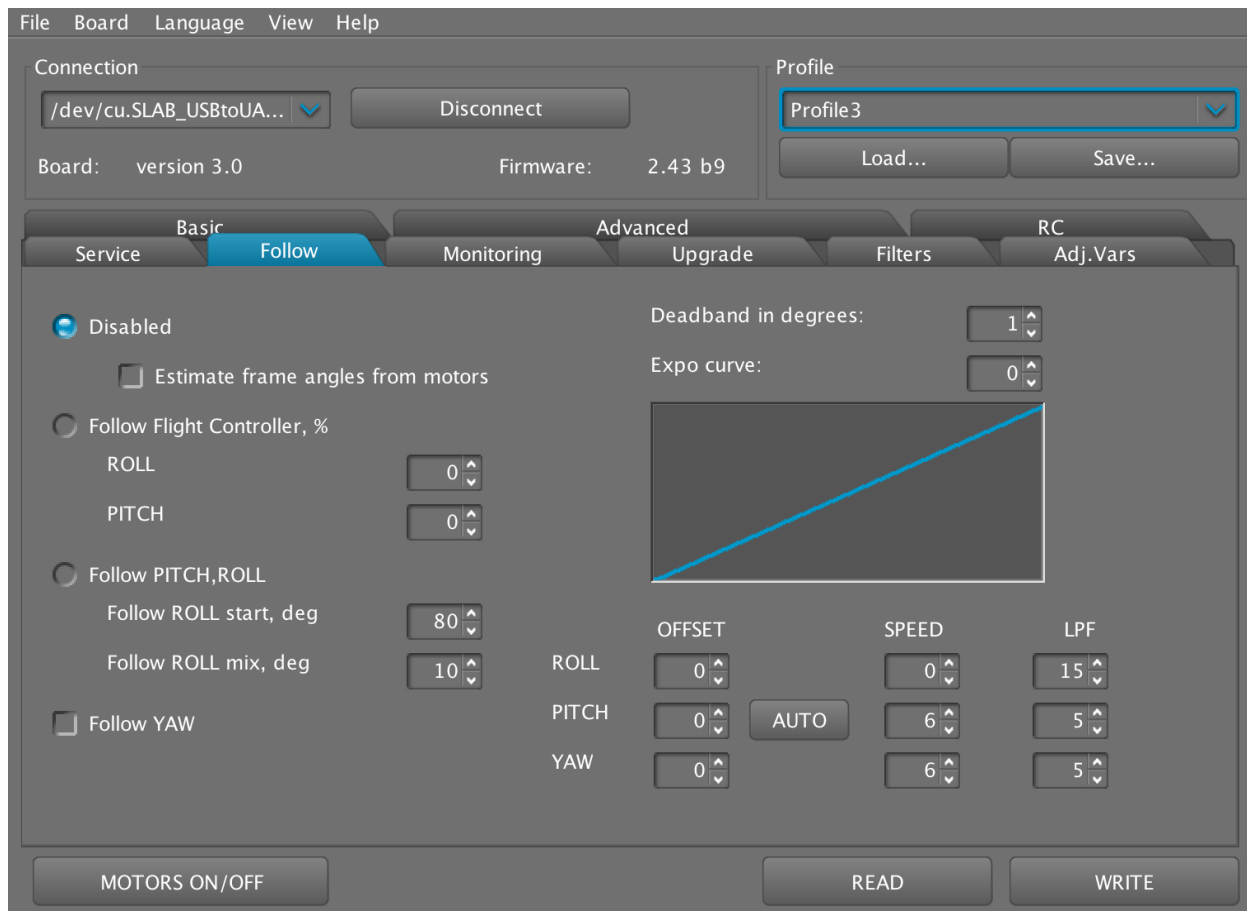
**Save the Settings by clicking the WRITE Button** after you've made the changes!

After saving your changes we need to use the drop down menu and select Profile3.



## For Profile3 use the Values Below

Notice how we have Disabled both Pitch and Yaw. Remember in Profile3 the gimbal does not follow either Pan or Tilt movements, therefore we have disabled these settings.



**Save the Settings by clicking the WRITE Button** after you've made the changes!

For in Depth on Profiles

Tutorial: [How to Use Gimbal Profiles and Service Modes](#)

Congratulations, you've completed the Default Settings for the CAME-TV 7800 32 bit Dual IMU 3-Axis Gimbal with firmware 2.43 b9.

To disconnect the Gimbal, **click the DISCONNECT button** at the top of the Application. Remove the USB cable from the gimbal, and power on your system.

After your Gimbal is disconnected, you can Power on the system by turning on the switch found on the back of the control box. If you need to calibrate your system, place the Gimbal on the stand and make sure it is Level.

Make sure the power is on, Click 4 times on the Joystick (service mode Calibrate ACC), and quickly square up the Gimbal Frame and Hold the camera so that the horizon is Level. Hold this position until the beeping stops.

Next Click 5 times on Joystick (Calibrate Gyros) and hold this position until the beeping stops. Your camera should remain level even as you operate the Gimbal.

Remember to Click the Joystick to change between the different Profiles for different Follow Mode options.

## **Tutorial: [How to Use Gimbal Profiles and Service Modes](#)**

If you are still having trouble with your system, we suggest also watching our [Advanced Setup Video](#).

or Contact Us using the information found at <http://www.came-tv.com/>