

# Hobby King Orange Rx Stabilizer setup guide by [MyCoolRC.com](http://MyCoolRC.com)

Revision 3

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[Click here](#) to see the Product at Hobby King

[Click here](#) to see links to Male to Male jumper cables (you need 3 of them)

[Click here](#) for RCGroups Support Thread

[Click here](#) for Generic RC Airplane gyro thread at RCGroups

[Click here](#) for more info on setting up RC Airplane Gyros at MyCoolRC.com

## **Description:**

The OrangeRx Flight Stabilizer from Hobby King is a 3 Axis gyro system designed to stabilize the flight of a 4Ch type Airplane. It provides stabilization for the Aileron (roll), Elevator (Pitch) and Rudder (Yaw) Axis. It utilizes an Atmel 168 processor and an Invensense ITG3205 Mems 3 axis gyro chip. On the board is an Atmel AVR ISP 6 pin type programming connection making it available for some 3<sup>rd</sup> party future upgrades or possible upgrades from Hobby King (No announcement of this availability or promises of this availability has been seen to date). The board has 3 independent gyro gain dials as well as a 3 switch Dip switch for reversing the gyro channels.

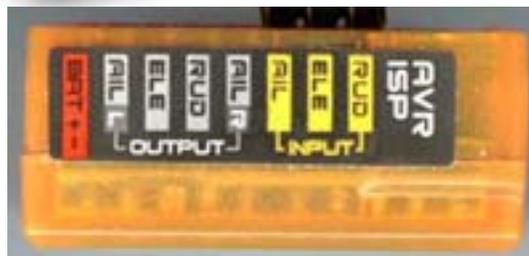
## **Pre Setup:**

I recommend that you fly the plane you plan to mount it on and try to achieve a mechanical setup that yields zero or near zero subtrims as well as full servo travel (100% ATV/Travel Adjust/Endpoint Adjust). Although these 2 steps are not required, they yield less problems in the end (like driving servos to the point of binding during flight or transport while on).

### Setup:

I recommend connecting up the system prior to gyro mounting to verify it is functioning properly.

### Connections:



Wire the Rx to the Stabilizer as follows:

- 1) Use Male to Male cables purchased separately.
- 2) Orient the Brown or Black lead of the cable to the outside edge of the board (shown as – on picture above) and the yellow or white lead towards the inside (shown as S on picture above).
- 3) Connect the Yellow AIL Input of the Stabilizer to the Aileron output of Rx
- 4) Connect the Yellow ELE Input of the Stabilizer to the Elevator output of the Rx
- 5) Connect the Yellow RUD Input of the Stabilizer to the Rudder output of the Rx

Wire the Servos to the Stabilizer as follows:

- 1) If you have 1 Aileron servo or 2 Aileron servos on a Y connector, connect to the Gray Ail[L] output of the Stabilizer. If you have 2 Aileron servos that are reversed from each other (connected on 2 separate channels in your TX, Mixed and reversed from each other), connect one to the Ail[L] and the other to the Ail[R]. Note that you MUST double check the Transmitter reversing before flight! Transmitter reversing is tested without moving airplane and ONLY moving sticks.

- 2) Connect Elevator Servo to Gray ELE output of the Stabilizer If you have 2 elevator servos and one is reversed from the other, you MUST install a separate Servo reverser supplied separately.
- 3) Connect the Rudder servo to the Gray RUD output of the Stabilizer.

#### Power:

There is a power connection available on the Orange Rx Stabilizer. So long as your RX is powered by a 5V power, and at least one of the servo wires going from the Rx to the Stabilizer has the Center Wire, you may leave this unconnected. Most people will not need to connect anything to the power input.. I do not know what the power tolerance is but I'm guessing they left this connection so you could isolate Rx power from Stabilizer power by removing the center wire of the RX to Stabilizer cables then use this power connection. You will know the Stabilizer is getting power from the Rx because the Red LED light on the Stabilizer near the Gain dials will come on when powered up.

#### **Verifying TX reversing**

If you have already flown your plane, making the above connections, you SHOULD NOT have to change the TX reversing, but you should test this now. Turn the gain dials of the Stabilizer all the way Counter Clock Wise (CCW). Power up Tx, then RX. Move the TX sticks and make sure all 3 axis respond correctly. Also verify none of the servos are binding. If so, fix this mechanically by adjusting the rods on the servo or surface horns.

#### **Verify Gyro reversing.**

For now, tape the stabilizer down to your plane with tape or foam tape in the approximate location you plan to put it at. Orientate the Stabilizer with the main label facing either Up or Down. Also face the servo connection either forward or towards the Rear. (Note, the orientation you do the gyro reversing MUST be the same as the way you plan to permanently install as orientation affects the gyro reversing). This will be suitable for initial testing.

#### **Aileron:**

Now with everything powered up, Turn the Aileron Dial all the way Clockwise (CW) to full gain. Quickly LIFT the right wing (roll plane left). The right aileron should have lifted up when you were lifting the right wing. If not, flip the AIL dip switch and try again. When you have it correct, reset the AIL dial to half way (50% gain).

#### **Elevator**

Turn the Elevator Dial all the way Clockwise (CW) to full gain. Quickly lift the tail up. The Elevator should have moved UP when you lifted the tail. If not, flip the ELE dip switch and try again. When you have it correct, reset the ELE dial to half way (50% gain).

#### **Rudder**

Turn the Rudder Dial all the way Clockwise (CW) to full gain. Quickly push the tail right (Nose left). The Rudder should have moved Right when you pushed the tail. If not, flip the RUD dip switch and try again. When you have it correct, reset the RUD dial to half way (50% gain).

[MyCoolRC](#) page on Generic Gyro testing.

### **Mounting Gyro**

Mount the gyro in the same orientation as you did the testing. Use some double foam tape such as Helicopter Gyro tape, or 3M Indoor/Outdoor tape (gray with red release paper). I recommend you avoid the 3M foam tape that is white with green letters. There are other mounting methods if you consult the RCGroups threads linked to on the first page. Do not tape directly to foam. I recommend you glue/epoxy some plastic or something to the foam first unless you can be assured that the gyro will not come loose in flight. A loose vibrating gyro can cause severe oscillations or an uncontrollable situation.

[Generic Airplane Gyro mounting page](#) at MyCoolRc

### **Double check your TX reversing and your Gyro reversing as described above!**

Note, as mentioned on the Gyro Test page at MyCoolRC, I do a gyro test and TX test before EVERY FLIGHT. It does not take much time at all! The more you do it, the quicker it will take.

### **Setting Gains**

At the time of the release of this revision of document, It is confirmed that the Orange Rx gain dials are very sensitive and do not have a good linear range. In other words, from fully CCW (say 7 o'clock) to mid position (12 o'clock), the gain dials do virtually nothing. From 3 o'clock to 5 o'clock, the gain jumps dramatically. For this reason, I recommend starting your first flight with the gains almost turned down to nil. That would be the ½ way 12 o'clock position. Moving the airplane should barely (if at all) move the control surfaces. It should be like it was before you flew the airplane. Fly the plane, trim it out, then land. Start to bump up the gains 1/16 to 1/32 turns at a time. Use some common sense here. If you want to be cautious, do it 1 axis at a time. You may find that the aileron axis is the most sensitive. You want to test for oscillations, If you get oscillations, you need to dial the gains back. You will get the possibility of oscillations at various speeds. Ailerons tend to get the worse in a downward high-speed dive. Elevators and Rudders vary for each plane but for a complete test, you want to fly at various speeds before you know your gains are good. On a very windy day, you MAY see more or temporary oscillations and if so, dial the appropriate gain back. Keep in mind that too much gain also works the servos harder and CAN cause pre-mature wear on the motors or servo pots. Some people have reported reduced roll/loop rates when gains are higher. Keep that in mind and do your loops/roll testing with enough altitude before building confidence.

### **And most important:**

Have FUN. If anyone criticizes you for using a gyro, just laugh at them when they pack up and go home due to the high winds or crosswinds!!!!