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Thank you for purchasing this product from Hobbyking. Before you start, please read the manual carefully. The following steps will walk you through the mounting and configuration of the Madcow 3D flight controller on your multirotor and open up a world of 3D flight to explore.

Warning & Disclaimer
The Madcow 3D Multirotor flight controller is specifically designed for 3D multirotor flight and racing, it is easy to use and the performance is superb. We have invested a lot of time into the design to ensure it is as safe as possible but it can still be dangerous in 3D mode if not fully understood. We strongly recommend customers to REMOVE ALL PROPELLORS while installing it, please carefully follow the steps in this manual to complete your setup correctly and safely. Hobbyking assumes no liability for damages or injuries incurred directly or indirectly from the use of this product.

1. Instructions
Flight Mode

1-Tipping Mode (Acro Mode)
0% - 100% of the throttle range corresponds to normal motor rotation only, in this mode the multirotor will not keep level balance automatically while roll and pitch are centered. Also known as “acro” or “manual” mode.
2-Grilling Mode (Acro Stabilized Mode)
0% - 100% of the throttle range corresponds to normal motor rotation only, in this mode the multirotor will maintain level balance automatically while roll and pitch are centered. The multirotor will still flip and roll and the angle of tilt is not limited, This is often called “horizon” or “rattitude” mode but is not capable of inverted flight.

3-Veal Mode (Stabilized Mode)
0% - 100% of the throttle range corresponds to normal motor rotation only, in this mode the multirotor will maintain level balance automatically while roll and pitch are centered. The multirotor will not flip and roll and the angle of tilt is limited.
(This mode can function as a rescue mode, if you are flying 3D and lose orientation, switching to this mode will quickly roll the multirotor back to normal flight and keep balance.)

4-Slaughterhouse Mode (3D Mode)
0% - 50% of the throttle range corresponds to reversed motor rotation, 50% - 100% range of the throttle corresponds to normal motor rotation, in this mode the multirotor will not keep level balance automatically while roll and pitch are centered. Also known as “manual” or “acro” mode but with added reversing of motors for inverted flight.

5-Madcow Mode (3D Stabilized Mode)
0% - 50% of the throttle range corresponds to reversed motor rotation, 50% - 100% range of the throttle corresponds to normal rotation, in this mode the multirotor will maintain level balance automatically while roll and pitch are centered. This is often called “horizon” or “rattitude” mode but with added reversing of motors for inverted flight.
2. Setup Wizard

Please remove all propellers while you mount and configure the Madow 3D Multirotor flight controller.

**Step 1. Connecting**

![Diagram of Madow 3D Multirotor flight controller connections]

1. Please ensure the order of ESCs are identical with the pictures below.
2. Connecting of HexaRotors.

Step 2. Assistant Software (Windows only at present although a Mac compatible version will be available soon).
Download the software from ‘www.hobbyking.com’
Unzip the file “Madcow 3D assistant software.zip”, you will get a folder as shown below.

Double click the icon (Madcow 3D.exe) to start up the software.
Step 3 Connect the controller
Using the USB cable to connect to your PC will also provide power to the Madcow 3D Multirotor flight controller. When connected, the 'Connected' notification light will glow at the bottom left of the interface to indicate a successful link.
**Step 4. Level calibration** (Complete this step if the multirotor cannot keep level in balance flight mode)
Place the multirotor on a level surface and click the 'Calibration' button on the right. The tips box offers assistance and clicking 'yes' will start the process that lasts 2 - 3 seconds. Calibration is successful when the angle of roll and pitch is 0°.
Step 5. Frame Select

Select your frame layout and ensure the order of esc and the rotation of motors in 2D flight mode (or 50% -100% throttle in 3D flight mode) is as shown in the interface.
Step 6. *RC calibration*

**First:**
Power on your transmitter and make sure the transmitter and receiver are bound.

**Second:**
Click 'Calibration' and follow the tip box, clicking 'YES' will automatically identify your type of receiver. Now move all channels from minimum to maximum range including all switches, sliders and rotary dials.

**Last:**
Move throttle stick to middle place and click complete to finish calibration.
Step 7: ESC Parameters and Gains.

7.1 ESC

OneShot125: When Oneshot 125 is enabled, the output will be OneShot125 (2KHZ). Or the output will be 400hz PWM.

Normal ESC: If you use normal esc, please choose this item.

Reversible ESC: If you use Reversible ESC for 3D flight, please choose this item.

ESC Throttle Range
(For example1, Normal ESC): 1100us ~ 1900us correspond to 0%-100% of the ESC throttle.
(For example2, Reversible ESC): 1100us ~ 1450us for the reversed throttle range, 1450 ~ 1550 for the dead area on the middle of the esc and 1550~2000 response for the normal throttle range.
7.2 Parameters

Max Attitude Angle: The max angle of roll/pitch in balance flight mode.
Max Attitude Rate: The max rate of roll/pitch at full range of the roll/pitch channel.
Max Yaw Rate: The max rate of yaw at full range of the yaw channel.
7.3 Gains

There are two modes to adjust response, Basic and Expert. You can select only one and this will be indicated with light SIMPLE. Clicking the grey button EXPERT will activate it and allow changes to be made.

**Simple mode:** For new pilots, you can tune the value quickly and easily.

**Expert mode:** For advanced pilots, here you can fine tune the value accurately to get the best performance for you.

**Now you have finished all the set up!**
3. Update

3.1 Update

Click \[\text{LOAD FILE}\] to choose the newest firmware, then click \[\text{UPDATE}\] to proceed.
3.2 Recovery mode
If the update fails and the controller becomes unresponsive, use the following method to resolve it.
Operation:

› Step1
Connect AIL channel and PWM1(ESC1) output as below.

› Step2
Connect the controller to your computer and start the Assistant software. Go to the update page and click to choose the newest firmware and click to update it.

› Step3
After a successful firmware update, disconnect the Madcow 3D flight controller from the computer and then disconnect the AIL channel and ESC1 output.

› Step4
Connect the controller to the computer with the original wiring and repeat the update procedure.

4. Definition of LED
ERR（Red LED）: error indicator light.
STA（Blue LED）: state indicator light.
While the controller is powered on, the STA (blue led) will blink to shown that the controller is in self-inspection.
When the ST led is off, the controller is ready to unlock and fly.
Switch to ARM and the STA (blue led) will glow constant to show ARM is successful. Now you can fly.
If ER (red led) light is on while ST light is off it indicates there are some mistakes in the setup, please re-power the controller or connect it to computer to see specifically what is wrong on the bottom left of the interface.
5. ARM and DISARM

5.1 ARM
Power on your transmitter, put the ARM/DISARM switch on DISARM and throttle to minimum.
Power on your multirotor and wait until STA (blue led) turns off.
Switch to ARM, the STA led will glow constant to show ARM is successful.

2D Flight Mode
Now raise the throttle over 0% and the motors will start spinning, the Madcow 3D flight controller is now ready to fly.

3D Flight Mode
Now raise the throttle over 50% and the motors will start spinning, the Madcow 3D flight controller is now ready to fly.

5.2 DISARM
Switching to DISARM will immediately cause the motors to stop running. (DO NOT switch to DISARM while the multirotor is flying.).
6. Connection of osd

1. Connect the wire as below.
2. Set the configuration of the MINIM OSD Interface as below:
MADCON
3D Multirotor flight controller

QUANUM