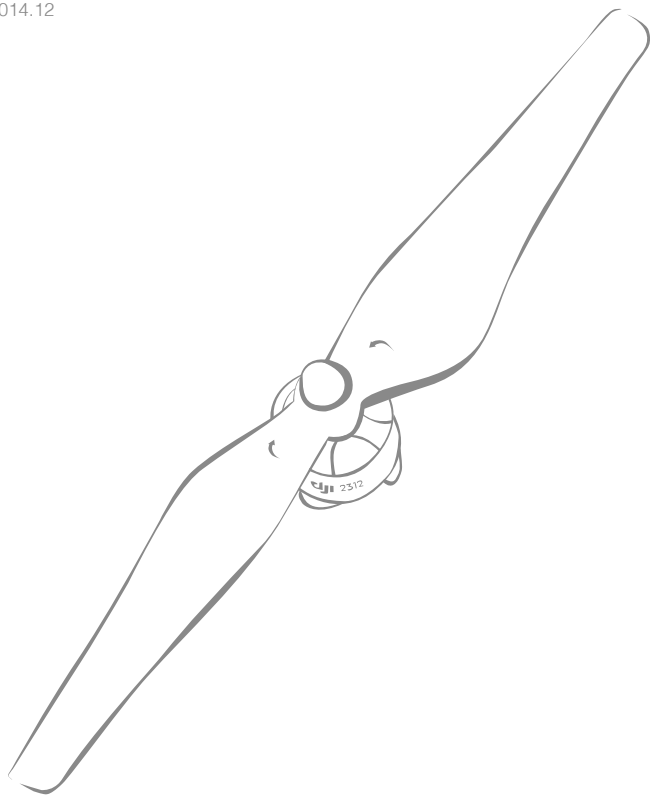


# DJI E310

## Multicopter Propulsion System

User Manual V1.0

2014.12



## Disclaimer

Thank you for purchasing the E310 (hereinafter referred to as "product"). Read this disclaimer carefully before using this product. By using this product, you hereby agree to this disclaimer and signify that you have read it fully. Please strictly install and use this product in accordance with the manual. DJI assumes no liability for damage(s) or injuries incurred directly or indirectly from using, installing or refitting this product improperly, including but not limited to using accessories not designated. Ensure your ESC firmware matches the motor you will attach it to. Otherwise, you are responsible for all consequences caused by your own conduct.

This device complies with part 15 of the FCC Rules.

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This disclaimer is made in various language versions; in the event of divergence among different versions, English version shall prevail.

## Cautions

When powered on, the motors and propellers will rotate very quickly and may cause serious damage and injury. Therefore, please always be aware for your safety.

1. Always fly your aircraft a safe distance away from people, animals, high-voltage lines and other obstacles.
2. Do not get close to or touch the motors or propellers when powered on, as this may cause serious injury.
3. Make sure there is no short circuit or open circuit.
4. Check that the propellers and the motors are installed correctly and firmly before flight.
5. Check whether all parts of your aircraft are in good condition before flight. Do not fly with worn or broken parts.
6. Use compatible DJI parts.

## Legend



Important



Hints and Tips

If you have any problems you cannot solve, please contact your local dealer or DJI customer service.

DJI Support Website:

**[www.dji.com/support](http://www.dji.com/support)**



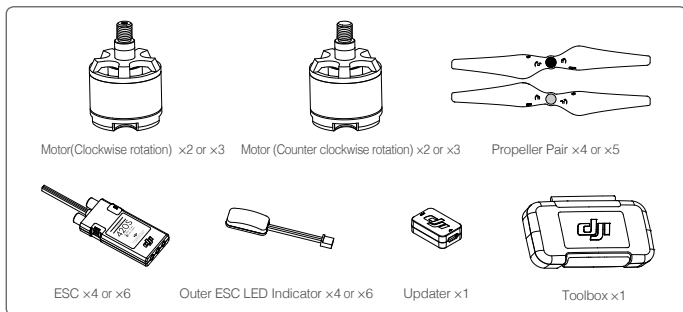
## About

The E310 Multirotor Propulsion System is a tuned propulsion system customized for multi-rotor aircraft weighing 1 to 2.5 kg. It is efficient, reliable and minimizes vibrations. A revolutionary Electronic Speed Control (ESC) with a sinusoidal drive replaces the traditional square wave drive, and along with the new AC permanent magnet synchronous motor, the whole propulsion system is brought into an era of higher efficiency while providing a steady torque output. The integrated sensors and patented algorithms give the whole system a high level of intelligence and redundancy, and advanced features include closed loop torque control, real-time system health diagnosis, distinct functional redundancy for the communication link, and more. Furthermore, the ESC's firmware can be upgraded by users, enabling you to enjoy the continual development of the system.

### 1. In the Box

The E310 is available in two different package configurations. The descriptions below correspond with the Quad-rotor and Hexa-rotor packages, respectively. Please ensure that you have the correct quantities of each part before beginning the installation process or using the product.

E.g. "Propeller Pair x4 or x5" indicates that there are four pairs of propellers included in the configuration for Quad-rotors and five pairs of propellers included in the configuration for Hexa-rotors.



**In the toolbox:** Power hub, Screws (M2.5x6.3), Screws (M3x8.1), Screws (M3x5.5), Wrench for propellers, Foam double sided adhesive tape, 2.0 mm hexagonal wrench, etc.

### 2. Gain Value Settings

The new E310 ESC, with a sinusoidal drive replacing the traditional square wave drive, offers improved acceleration and deceleration performance. Before using, reduce the gain values according to your flight control system and frame to achieve the same sensitivity as older ESCs (which use a traditional square wave drive). The table below shows typical gain values when using the E310 with a DJI A2 flight control system and a DJI F450 multirotor flying platform:

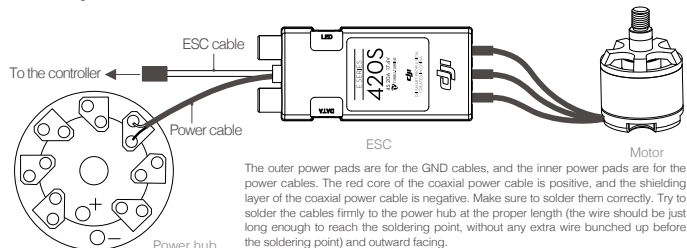
Basic			Attitude		
Pitch	Roll	Yaw	Pitch	Roll	Vertical
40%	40%	60%	160%	160%	100%


### 3. Connecting the ESCs


#### Tools Required

**Tools:** Electric soldering iron & soldering tin    **Use:** Soldering each ESC's power cables to the power hub

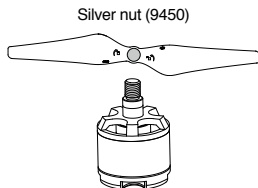
- 1) Check the color tags on the ESC cables to identify the default color of the ESC LED indicator (red or green). Mount the ESCs onto the appropriate positions of your aircraft according to the LED color. Note: The LED color can be adjusted in DJI ESC Assistant.
- 2) Please solder each ESC to the power pads on the power hub as shown in the figure below. Make sure that the solder is firmly attached on the power pads and that there is no possibility for a short circuit. The power cable is a coaxial power cable. Do not damage the protector on the red cable to avoid short circuit.
- 3) Connect the signal cable to your controller. The orange wire of the signal cable is for the control signal; the brown wire of the signal cable is for the GND; and the red wire is reserved.
- 4) Connect the motor to the ESC. Test the motor and make sure the rotation direction of each motor is correct. If not, switch the position of any two cables that are connecting the motor to the ESC to change the rotation direction.



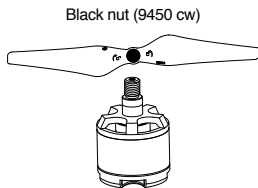
 Make sure there is no short circuit or open circuit.

 It is recommended that you solder a power connector onto the power hub.

### 4. Assembling the Propellers



Attach the propeller with a silver nut onto the counter clockwise motor.



Attach the propeller with a black nut onto the clockwise motor (which has an indent on the screw).



**Lock:** Tighten the propeller by rotating it in this direction.



**Unlock:** Remove the propeller by rotating it in this direction.

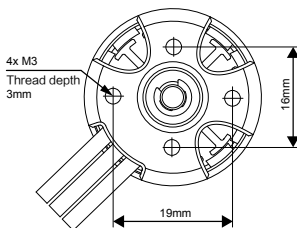
1. **Tighten** the propellers by following the instructions above.
2. Hold the motor in place and remove the propeller according to the instructions above.



DO NOT use any thread locker on the propeller or motor threads.

## 5. Mounting the Motors

Mount each motor to a frame arm according to the size of the assembly hole.



- The screw size is M3. Mount the motors using appropriate screws.
- Note the thread depth and the size of the screws. Using screws that are too long or too large may damage the motor.

## 6. ESC Ports Description

There are two ports on every ESC. They are ① Data/ESC Firmware Update Port and ② Outer ESC LED Port. Identify the marks on the ESC.



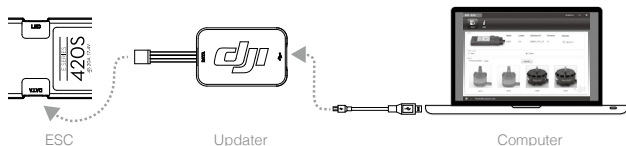
Ensure your ESC firmware matches the motor you will attach it to. Refer to the tag on back of the ESC to see the default firmware version.



- Mount the outer ESC LED indicators according to your needs.
- The Data/ESC Firmware Update Port is used to update the ESC firmware. To do this, visit the official DJI website to download the DJI ESC Assistant. <http://www.dji.com/product/e310/download>



## 7. Updating Your ESCs



Unplug any other serial devices connected to your computer before updating. Then follow the instructions below:







- 1) Download the ESC Assistant installer from the DJI website. Run the installer and follow the prompts to finish the installation.
- 2) Connect one end of the Updater to the Data/ESC Firmware Update Port. Connect the other end of the Updater to a computer with a Micro-USB cable. Power on the ESC. DO NOT disconnect until configuration is finished.
- 3) Run the ESC Assistant and wait for the ESC to connect. Watch the indicators on the bottom of the screen. When connected successfully, the Computer Connection status will be solid green and Data Exchange Indicator will blink blue.
- 4) Click on the [View] page. In the "ESC" section, check the current firmware version and ensure the installed firmware is the latest version. If not, click the link and follow the prompts to upgrade.



If the ESC is not automatically recognized by the DJI ESC Assistant (the indicators on the bottom of the screen show a solid green and an inactive blue), check whether there is more than one DJI Updater, FTDI USB adapter, or other developer tool (including, but not limited to, BeagleBone, Raspberry, Arduino, etc.), which may use the FTDI chipset, connected to the computer. If any of these FTDI devices are connected, simply unplug them and keep the DJI Updater connected to the computer. Then, restart the DJI ESC Assistant and the ESC system to form a successful connection.

## 8. ESC LED Indicators & Sound Description


The description is the same for both outer ESC LED indicators and inner ESC LED indicators, as shown below:

LED Indicators	Sound	Description
 Yellow, Green blinking in turn	None	Motor is being recognized.
 Red or Green blinking slowly	♪1356	Ready.
 Solid Red or Green	None	Motor starts normally.
 Red, Yellow blinking in turn	None BB---BB---BB... BBB---BBB...	Fail to Self-Test. Input voltage is abnormal. The motor parameters don't match the firmware data saved in the ESC.
 Quick Yellow blinking	BBBBBB...	Throttle stick is not at the bottom position.
 Slow Yellow blinking	B-----B-----B...	No signal input.

 — Solid Yellow

None

Motors are rotating at full throttle.

 ..... Quick Red blinking

None

Error, land your aircraft immediately\*

\* You can learn more about any errors by connecting the ESC to the DJI ESC Assistant.



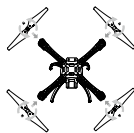
You can understand the working status by observing the LEDs and listening to the sound of the ESC.

## 9. Specifications

Max Thrust	800 g/rotor @ 12 V (Sea Level)
Takeoff Weight Recommended	350 g/rotor @ 3S LiPo 400 g/rotor @ 4S LiPo
Battery Recommended	3S LiPo
Working Temperature	-10 ~ 40°C
<b>ESC</b>	
Max Allowable Voltage	17.4 V
Max Allowable Current (Persistent)	20 A
Max Allowable Peak Current (3 seconds)	30 A
Signal Frequency	30 ~ 450 Hz
Battery	2S ~ 4S LiPo
Weight (with cable)	43 g
Weight (without cable)	30 g
<b>Motor</b>	
Stator Size	23×12 mm
KV	960 rpm/V
Weight	60 g
<b>Propeller</b>	
Diameter / Thread Pitch	9.4×5.0 inch

## 10. Used Together with DJI Product

Product list: DJI F450, DJI F550



Used Together with DJI F450

The content is subject to change.

Download the latest version from

<http://www.dji.com/product/e310>

