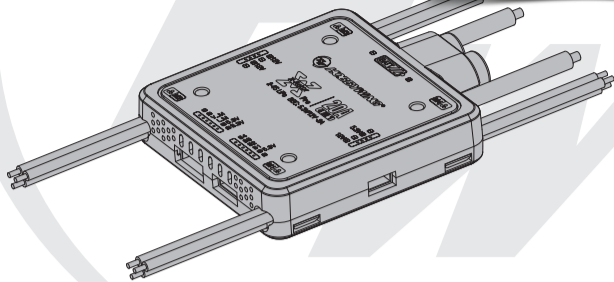


X-Rotor USER MANUAL
Multi-Rotor
 Brushless Electronic Speed Controller
 XRotor Pro 20A/25A 4IN1 20161227



Thank you for purchasing this HOBBYWING product! Brushless power systems can be very dangerous. Any improper use may cause personal injury and damage to the product and related devices. We strongly recommend reading through this user manual before use. Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damage or losses resulting from the use of the product. We do not assume responsibility for any losses caused by unauthorized modifications to our product. We, HOBBYWING, are only responsible for our product cost and nothing else as result of using our product.

01 Warnings

- Ensure all wires and connections are well insulated before connecting the ESC to related devices, as short circuit will damage your ESC.
- Ensure all devices are well connected, in order to prevent poor connections that may cause your aircraft to lose control or other unpredictable issues like damage to the device.
- Read through the manuals of all power devices and aircraft and ensure the power configuration is rational before using this unit.
- Please use a soldering iron with the power of at least 40W to solder all input/output wires and connectors.
- Never get the motor locked up during high-speed rotation, otherwise the ESC may get destroyed and may also get your motor damaged.
- Stop using the ESC when its casing temperature exceeds 90 C/194 F ; otherwise the ESC may get destroyed and may also get your motor damaged.
- Always disconnect and remove batteries after use, as the ESC will continue to consume current if it's still connected to batteries. Long-time contact will cause batteries to completely discharge and result in damage to batteries or/and ESC. This will not be covered under warranty.

02 Features

- Special core program for multi-rotor controllers meets various functional requirements against multi-rotors.
- Specially optimized ESC for excellent compatibility with QAV motors.
- Multiple output ports for powering different accessories such as picture transmission module, camera, LED lights and etc.
- Amp/Volt testing port for flight controller testing Amp/Volt in real time (the FC needs to support this function, like APM's.).
- DEO (Driving Efficiency Optimization) technology significantly reduces the ESC temperature, improves the throttle response, and strengthens the stability and flexibility of multi-rotors. This ESC is quite suitable for QAVs. (The motors slow down rapidly, especially when reducing the throttle amount.)
- Compatible with "Regular" signal-receiving mode (that is the ESC can receive regular throttle signals range from 1100µs to 1940µs) and "One Shot" signal-receiving mode (that is the ESC can receive fixed throttle signals range from 125µs to 250µs).

03 Specifications

Model	Con. Current	Peak Current (10s)	BEC	LiPo	Weight	Size	Applications (For reference)
XRotor Pro 20A 4IN1	20A	25A	5.3V/12V 2A	2-4S	57g	63x50x11.7mm	250-300 Class (Multi-rotors)
XRotor Pro 25A 4IN1	25A	30A	5.3V/12V 2A	2-4S	57g	63x50x11.7mm	280-450 Class (Multi-rotors)

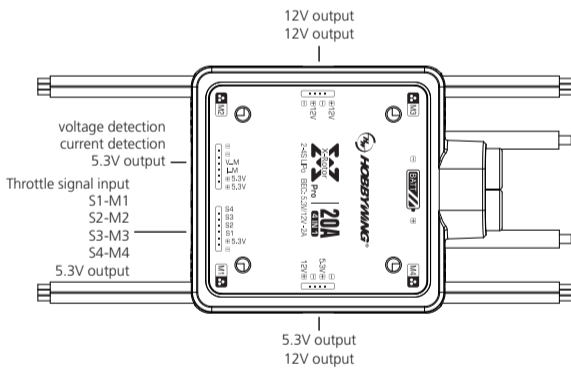
Note: Users cannot change the signal-receiving mode during the powering up process and the flight. If necessary, they need to change the mode on the flight controller (on the condition that the flight controller has the "One Shot" signal-receiving mode), after that, disconnect the battery and then re-connect the pack, then the ESC will complete the mode change (the ESC will automatically re-detect the type of the input throttle signals and then execute the corresponding signal-receiving mode).

04 User Guide

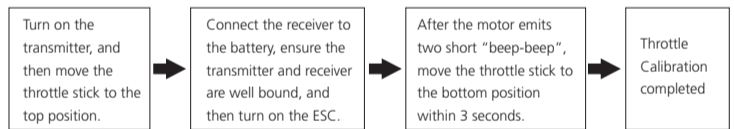
Throttle Calibration & ESC Programming

- After it's connected to the flight system, the ESC will automatically detect the input throttle signals every time it's powered on and then execute the corresponding signal-receiving mode.
- Users can calibrate the throttle range and change the timing advance in "Regular" signal-receiving mode but cannot do either in "One Shot" signal-receiving mode.
- In "Regular" signal-receiving mode, we recommend calibrating throttle range when the first time to use our XRotor series of brushless ESCs on condition that your flight controller supports throttle calibration; if not, then use the default throttle range (1100~1900µs). (Note: please calibrate the throttle range through your transmitter when serious out-of-sync issue among motors occurs.)

1 Step 1: Diagram



2 Step 2: Radio Calibration



This is an extremely powerful brushless motor system. We strongly recommend removing your propellers for your own safety and the safety of those around you before performing calibration and programming functions with this system.

05 Normal Start-up Process

Turn on the transmitter and move the throttle stick to the bottom position.



The motor will emit a long "beep----" 1 second after the system is connected to the battery indicating the ESC is armed and the multi-rotor is ready to go.

06 Multiple Protections

- **Start-up Protection:** The ESC will shut down the motor if it fails to start the motor normally within 2 seconds by increasing the throttle value. In this case, you need to move the transmitter throttle stick back to the bottom position and restart the motor. (Possible causes of this problem: poor connection/disconnection between the ESC and motor wires, propellers are blocked, etc.)
- **Over-load Protection:** The ESC will cut off the power/output when the load suddenly increases to a very high value. Normal operation will not resume until the throttle stick is moved back to the bottom position. The ESC will automatically attempt to restart when the motor and the ESC are out of sync.
- **Throttle Signal Loss Protection:** When the ESC detects loss of signal for over 0.25 second, it will cut off the output immediately to avoid an even greater loss which may be caused by the continuous high-speed rotation of propellers or rotor blades. The ESC will resume the corresponding output after normal signals are received.
- **Motor Lock-up Protection:** ESC will cut off its output to motor immediately when it detects the motor is locked up, and then try to restart the motor. It will cut off the output completely if the motor is locked up for over 1 second. In this condition, you can only restart the ESC and resume its output through pulling the throttle stick to the bottom position first and then pushing the stick upward.

07 Troubleshooting

Trouble	Warning Tone	Possible Cause	Solution
The ESC was unable to start the motor.	"Beep beep beep..." (The motor beeps rapidly)	The throttle stick is not at the bottom position.	Move the throttle stick to the bottom position or re-calibrate the throttle range.
The ESC was unable to start the motor.	"Beep, beep, beep....." (Time interval is 2 second)	No output signal from the throttle channel on the receiver.	Check if the transmitter and receiver are well bound; Check if the throttle wire has been properly plugged into the throttle channel on the receiver.
The ESC was unable to start the motor.	"Beep beep beep..." (The motor beeps rapidly)	The entire throttle range is too narrow (It's requested that the entire throttle range cannot narrower than 3 lines when designing an ESC.)	Refer to the transmitter vendor instructions and adjust the entire range of the throttle channel or re-calibrate the throttle range.