



FPV VERSION  
ESC

# USER MANUAL

2016.10

## DISCLAIMER ▶

Thanks for purchasing our Electronic Speed Controller (ESC). High power system for RC model can be very dangerous. Any improper use may result in injury and damage to human and devices. We strongly recommend that you read this manual carefully before use, and abide by its rules. We assume no responsibility for personal injury, property damage or consequential losses resulting from the product.

## NOTES ▶

- To avoid any damage to the ESCs from irrational propulsion system and aircraft collocation, please read relevant manual before ESC utilization.
- Please make sure all the wires and joint parts are well insulated, short-circuits will cause damage to the ESCs. If welding is required, please use welding equipment of equivalent power. Bad welding will lead to disorder over aircraft control, and many other unpredictable problems.
- Never lock the rotor of motors when ESCs are on the run. Otherwise, fatal damage will be caused to ESCs and possibly to the motors too. When motor stalling occurs, please cut off the throttle or pop batteries out immediately.
- Never use ESCs in high temperature environment. Being used at high temperature, ESCs might trigger Temperature Protection and get damaged.
- Do not forget to cut off the connection of ESCs and batteries after use.

## FEATURES ▶

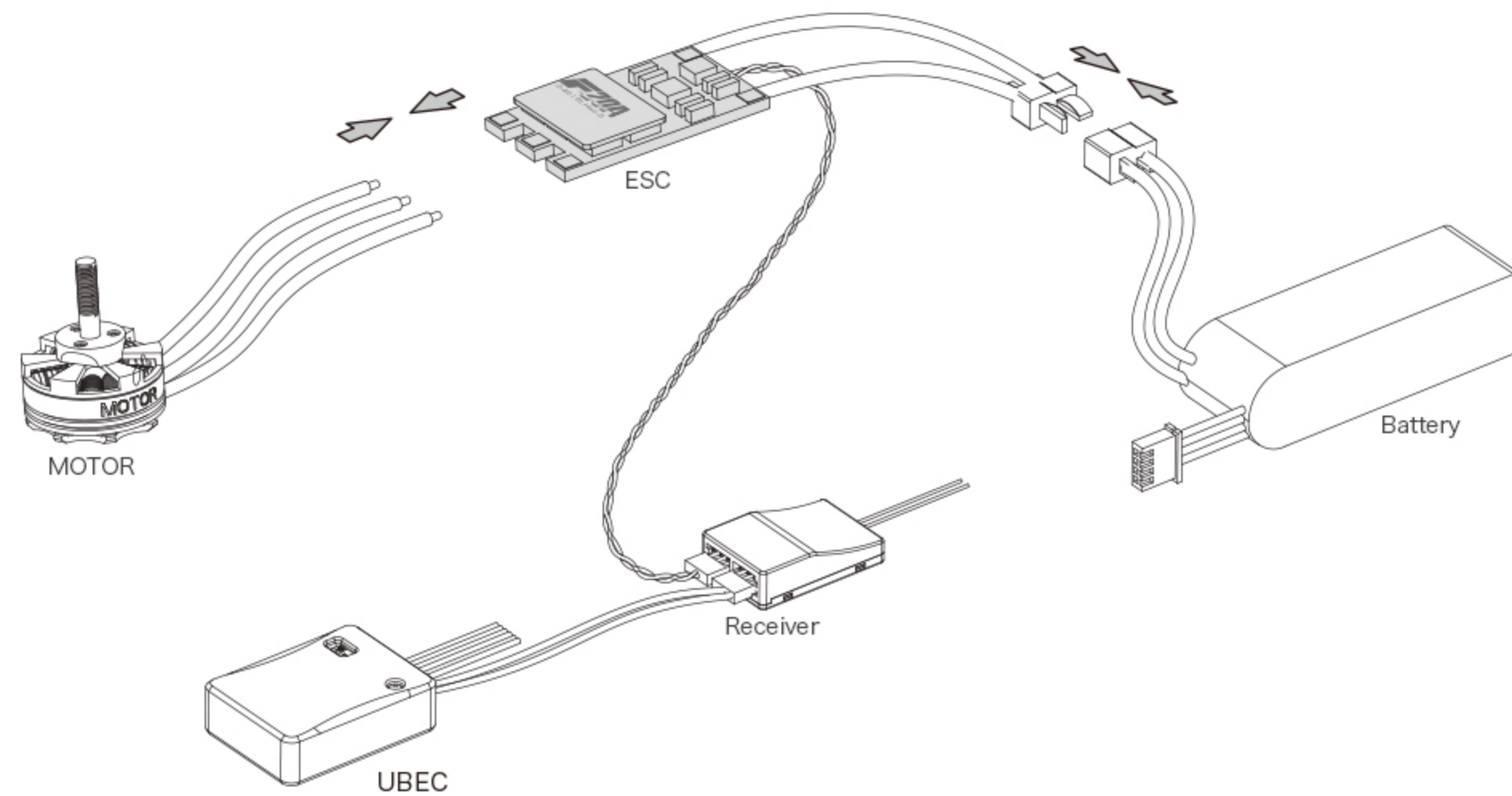
- Original BLHeli-S firmware.
- Mini size, ultra-light.
- Quick parameter adjustment: all the ESC parameters can be adjusted simultaneously via flight controller.
- Perfect Dshot150, Dshot300 and Dshot600 integration. Support 1-2MS, Oneshot125, Oneshot42 and Multishot.
- Twisted pair (TP) throttle signal cable reduces the crosstalk during signal transmission which guarantees stable flight.

## FEATURES ▶

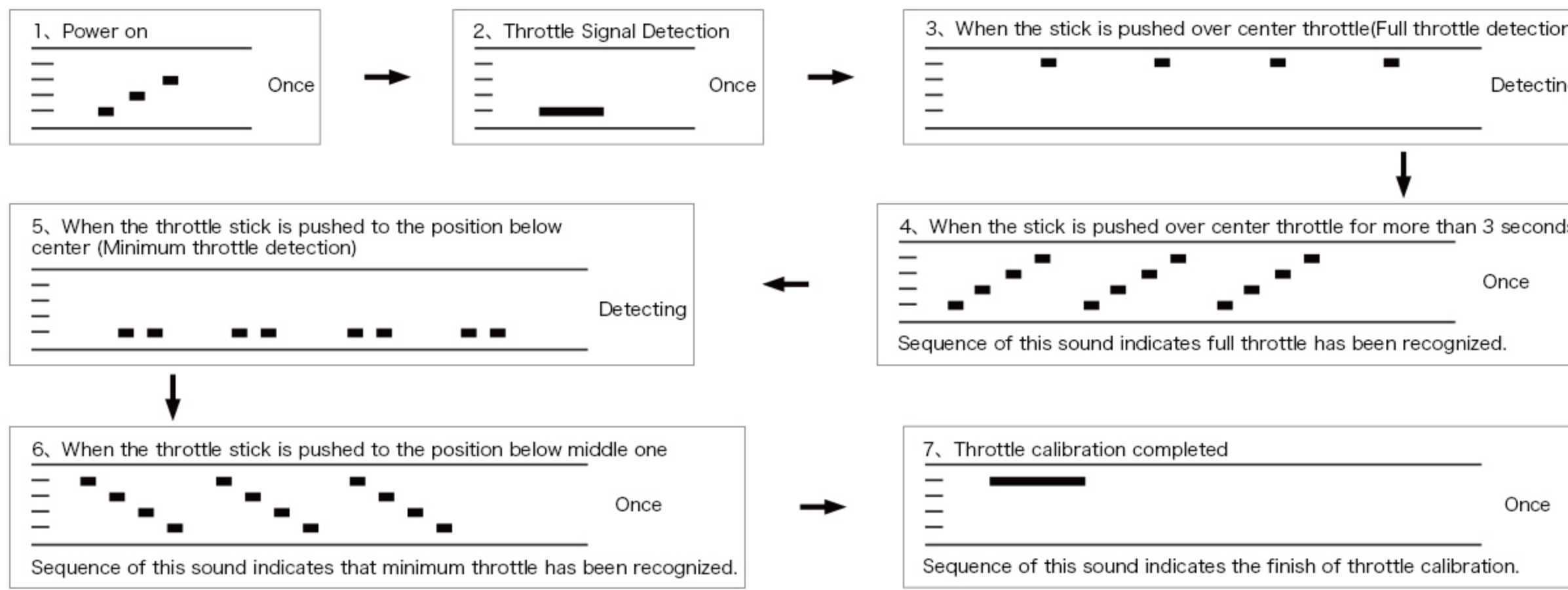
Model	Continuous Current	Peak Current (10s)	BEC	Lipo	Wight	Size (L*W*H)mm	MCU
F 20A 4S	20A	30A	NO	2-4S	3.7g	23.5*11.1*5	EFM8bb21f16G
F 30A 4S	30A	40A	NO	2-4S	4.3g	25.5*12.7*5	EFM8bb21f16G
F 30A 6S	30A	40A	NO	2-6S	6.6g	30.5*14.9*5	EFM8bb21f16G

## USER GUIDE ▶

### 1. Wiring Diagram

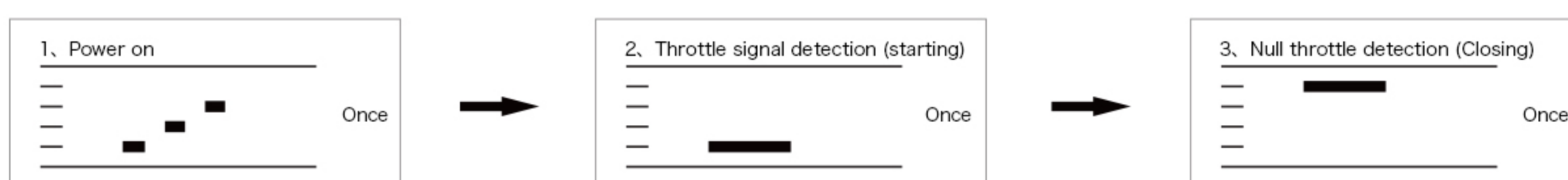


### 2. Throttle Range Calibration



⚠ Attention! For safety sake, please remove the propellers during throttle calibration.

### 3. Normal Startup Process



Motors are ready to get started.

## PROGRAMMABLE PARAMETERS ▶

	Function	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Startup Power	0.031	0.047	0.063	0.094	0.125	0.188	0.25	0.38	0.50	0.75	1.00	1.20	1.50
2	Temperature Protection	Off	80	90	100	110	120	130	140					
3	Low RPM Power Protection	Off	On											
4	Motor Direction	Normal	Reversed	Bidirectional	Bidirectional Rev	High								
5	Demag Compensation	Off	Low	High										
6	Motor Timing	Low	Medium Low	Medium	Medium High	High								
7	PPM Min Throttle	1100-1692	1148											
8	PPM Max Throttle	1288-2020	1832											
9	PPM Center Throttle	1152-1828	1488											
10	Brake On Stop	Off	On											
11	Beep Strength	Off	2-255	40										
12	Beacon Strength	1-255	80											
13	Beacon Delay	1-10minutes	Infinite	10minutes										

### SETTINGS IN GREY ARE DEFAULT

#### Adjustable Parameters

##### 1. Startup Power:

Startup power refers to the max. power allowed at startup stage, which can be any relative value from 0.031 to 1.5. Real power depends on input throttle, but the min. value cannot be lower than 1/4 of the max. power. In addition, startup power, which restricts the power of rotating direction change, shows its influence on bidirectional setting. In low RPM running, max power which can be adjusted via startup power parameters setting, is limited for BEMF voltage detection. In low RPM running (since from 16.1 version), low startup power means low max. power.

##### 2. Temperature Protection:

There are off and on modes for this setting.

##### 3. Low RPM Power Protection:

It is recommended that this setting be invalid when motors of low kv powered with low voltage. However, invalidity will increase the risk of step out and get motors and ESCs burnt.

##### 4. Motor Drection:

Motor direction can be normal, reversed, bidirectional and bidirectional reversed. In bidirectional mode, center throttle stands for null throttle. Throttle position above center one, motors rotate normally, otherwise, motors will rotate in a reversed direction. Bidirectional mode will invalid RC parameter setting.

##### 5. Demag. Compensation:

Demag. compensation is meant to avoid motor stalling from long time wire demagnetization. High timing helps with that, however, it brings efficiency down. It begins to detect on demag. Compensation occurrence. When motor timing is unavailable, motor rotating direction will be changing according to motor timing estimate. Motor power will be cut off before a next direction change. Demag. compensation degree will be calculated. The severer demag. compensation is, the more power will be cut. When demag. compensation is on "OFF" mode, power won't be cut off. Technically, higher demag. compensation parameter means better protection. Nevertheless, if demag. compensation parameter is set too high, max. power drops slightly.

##### 6. Motor Timing:

There are low, medium low, medium, medium high and high timing settings, and they are 0°, 7.5°, 15°, 22.5° and 30°. Generally, medium timing suits most of the require-ments. In case of motor vibration, please try changing motor timing. It takes longer for high induction motors to demagnetize for direction change which leads to motor stalling or vibration on quick throttle increase. This phenomenon occurs especially at low RPM. High timing allows longer time for demagnetization, and thus helps to improve the above mentioned issue.

##### 7. Min. Throttle, Max. Throttle & Center Throttle:

These settings decide throttle pos, and usually for input signal of 1000-2000us. Other input signals should be interpreted proportionally. Center throttle is for bidirection only.

##### 8. Brake On Stop:

There are off and on modes for this setting. Validity of this setting ESCs will generate automatic braking at null throttle. This setting shows no influence at NZ throttle.

##### 9. Beep Strength:

Beep strength can be adjusted in compliance with normal operation.

##### 10. Beacon Strength:

ESCs will emit beacon beeps, once null throttle signal lasts for some time. Please note that high beacon strength brings heat to ESCs and motors.

##### 11. Beacon Delay:

This setting determines the delay in time before beacon beeps.

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