## HOBBYMING



Thank you for your purchase.

Once used, it is considered to be an acceptance of all the contents. Please follow the manual instructions carefully during the installation. Modification may result in personal injury and product damage.

We reserve the rights to update the design and performance of the product without notice

Please read the following statement carefully before use.

HW-SMC802DUL-V1-A0

## 01 Introduction

The COMBO-XRotor-X11-MAX brushless power system is a plant protection power system that adapts to a single-rotor load of 20-22kg/rotor. The maximum thrust of a single-rotor is 44kg; it is suitable for a 50mm carbon fiber tube arm; the overall waterproof level is IPX6, and it is not afraid of rain pesticides, salt spray, high temperature, sand and dust, impact resistance, mud and sand resistance; the ESC uses FOC vector control, based on PMSM system algorithm optimization; the system has digital throttle and analog throttle, which can make the flight more stable; the system has power-on automatic detection, power-on voltage abnormal protection, over-current protection, stall protection and other protection functions; use CAN communication, with real-time data transmission; built-in fault storage function, can record fault data

## 02 Safety Precautions

- When use it please keep away from crowd, high voltage cable and obstacles and conform to safety norm.
- Never approach to the high-speed rotating propeller & motor so as to avoid being injured by blade.
- Check if all the components are good before use. If there is any damaged component, please contact after-sale service for replacement.
- Check if the screw of connecting parts is loose or whether the motor is horizontal before flight.
- The X11-MAX power system is connected to a circular tube arm with a diameter of 50mm.
- The color of the power system navigation light is optional. After removing the light housing, you can select the desired color by flipping the dial switch.
- The motor should be kept clean and can be washed with water after each fly has been completed.
- This function can be realized only when the flight controller has a CAN channel.
- There is no digital throttle for serial communication. Serial communication is optional for this power system.

# **03** Components of the Power System



## **04** Power system installation

- The whole power system has been assembled before leaves the factory. Unpack and take out the power kit to install on the rack of plant-protection plane as per the rotation direction of motor. • The yellow, gray and green cables are the data output. Upgrade signal wire (ESC system is upgradable) and digital throttle using the Hobbywing CAN protocol. The yellow wire is ground wire, the gray wire is CAN-High( CH), and the green wire is CAN-Low( CL).
- The optional serial communication power system. Yellow, red and green cables are the data output and upgrade signal line (the ESC system is upgradable)
- The black and white is the PWM throttle wire, the black wire is ground wire, and the white wire is signal wire
- The data signal line outputs in real time; the input and output throttle, motor speed, bus current, phase current, bus voltage, capacitor temperature, Mosfet temperature and other data.  $\bullet$  The throttle pulse width was fixed at 1050~1950 $\mu s.$
- The CAN digital throttle needs to be adapted separately by the flight controller and the Hobbywing CAN protocol. Please obtain the agreement from Hobbywing sales, after-sales service, agents, flight control manufacturers, etc.





## 08 Warning beep description

Motor fails to start after power on	"Beep beep beep" rapid monotone	Throttle is not reset to zero	Push the throttle to the lowest point or recalibrate the throttle point
Motor fails to start after power on The power-on voltage is lower	"Beep, Beep, Beep" (2 second for each interval)	No throttle signal input on the receiver throttle channel	Check if transmitter and receiver is normal. Check if wiring of throttle channel is normal
than 18V or higher than 82V	"Beep , Beep , Beep" (1 second for each interval)	Battery voltage is too low or too high	Replace with a suitable battery

## 09 Daily usage

### Adjust LED light color

Use a tool to take out the M3×8 screws that fasten the lampshade, and set the switch according to the corresponding light color below (factory default green). After the setting is successful, assemble and fasten the lampshade in the original way

ON	ON	ON	White
ON	OFF	ON	Blue
ON	ON	OFF	Purple
ON	OFF	OFF	Blue
OFF	ON	ON	Yellow
OFF	OFF	ON	Green
OFF	ON	OFF	Red
OFF	OFF	OFF	LED Off

### 2 Description of light color status

Flashing of LEDMeaningSolutionSingle short flashOver-voltageReplace the battery (Voltage below 82V)2 short flashUnder-voltageReplace the battery (Voltage below 82V)3 short flashOver-current- Check the motor for foreign objects and check the propeller, then power on again - Contact after-sales serviceSingle long flashOver-current- Check connection between signal line to the flight controller - Check whether the remote controller and flight controller - Check whether the remote controller and flight controller - Check whether the remote controller and flight controller - Check the erisstance of the black and white wires, if there is a short circuit, contact the after-sales serviceSingle long flash + Single short flashThrottle not reset to zeroSingle long flash + Single short flashMosfet overheated (Over 110°C)Single long flash + 3 Short flashCapactor overheated (Over 110°C)Single long flash + 4 Short flasheCapactor overheated (Over 110°C)2 long flashes + 3 Short flashStall protection2 long flashes + 4 Short flasheStall protection2 long flashes + 3 Short flashMotor short-circuit2 long flashes + 3 Short flashMotor short-circuit2 long flashes + 3 Short flashPhase Apperational amplifier is abnormal2 long flashes + 4 Short flashPhase Apperational amplifier is abnormal2 long flashes + 4 Short flashPhase Apperational amplifier is abnormal2 long flashes + 4 Short flashPhase Apperational amplifier is abnormal2 long flashes + 4 Short flashPhase Apperational amplifier is abnormal<						
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		3 long flashes	Phase C operational amplifier is abnormal	Re-power on to return to normal	Contact after sales service	

### 3 Replacing the propeller

• Use the appropriate tools to take out the two propeller fastening screws in and replace them with intact propellers. If you need to replace the propeller clips, continue to take out the fastening screws and replace the whole set of propeller clips and propellers.

Installing the propeller clip blades

Firstly, install the bottom cover on the motor, followed by the propeller blades, propeller gaskets, upper cover (propeller clips) and the final screws in order; pay attention to the installation of the propeller screws, After clamping, the propeller should rotate freely, and make sure that the propeller clamp and the motor fastening screw are tightened and screw glue is used at the same time.

### Firmware upgrade

- There are two ways to upgrade the software: online upgrade via a computer or using flight control remote. The explanation using the flight control remote are as follows This function needs to use DataLink data box, special DataLink software for upgrade package, and USB data cable.
- DataLink data box version requirements, LINK-01.2.14-C or higher version, LINK-01.2.09-U or higher version; DataLink software contact Hobbywing to obtain.
- Note: Please ensure that the computer has already installed the Microsoft Visual C++ 2013 before or later using. An upgrade package contains only one program for each ESC. For other programs, please obtain a new upgrade package. For additional details, please refer to the DataLink user manual. The upgrade package can be obtained at the place of purchase; Hobbywing official website, dealers, Hobbywing sales, Hobbywing, and after-sales service. The FOC ESC is one-dimensional and can only be upgraded on a fixed version, not at will.
- Note: It can only be upgraded from the existing program. Software and hardware cannot be upgraded together.

### 4.1 CAN ESC upgrade

- 1) Connection
- Connect the computer and the DataLink data box with a USB cable
- ESC---->DataLink data box "yellow red green"---->"- 🗆 D", any channel from D1-D8 is acceptable, and it is recommended to use D1 channel first. 2) Software acquisition
- It can be obtained at the place of purchase; Hobbywing official website, dealers, Hobbywing sales, and Hobbywing after-sales service. Note: It can only be upgraded from the existing program, and software and hardware cannot be upgraded together



\*Not: The picture is only for reference, please make the object as the standard.

Diameter Pitch: 48\*17.5 inch

Weight (INC. adapter): 397g

Propeller

# **05** Specifications

Recommend Take-off Weight: 20-22kg/rotor (70V, Sea Level) Recommended Battery: 18S LiPo (Max 78.3V) Powertrain Arm Tube Outer Diameter: 50mm Protection Grade: IPX6 Maximum Torque: 11.8kg (70V, Sea Level) Operating Temperature: -20°C-50°C Total Weight: 28000g (INC. prop) Support throttle Frequency: 50-500Hz

ESC Continuous Current: 50A (Non-hermetic Ambient Temperature < 60°C) Maximum Current.: 150A (Non-hermetic Ambient Temperature <60°C) Recommended Battery: 185 LiPo Throttle Pulse Width .: 1050-1950µs

### Motor Stator Size: 11122 Motor dimension: 120\*55.2mm KV: 60

## **J6** Parameters

Voltage (V)							
		40%	10800	15.1	1044.7	1525	10.3
		42%	11830	17.2	1192.7	1595	9.9
		44%	12875	19.5	1350.0	1664	9.5
		46%	13920	21.9	1514.0	1729	9.2
		48%	14975	24.4	1686.0	1792	8.9
		50%	16175	27.3	1888.9	1861	8.6
		52%	17340	30.3	2093.0	1925	8.3
		54%	18580	33.5	2317.8	1989	8.0
		56%	19755	36.7	2537.8	2048	7.8
	HW	58%	20750	39.5	2729.4	2096	7.6
70V	48*17.5Inch	60%	21920	42.8	2961.2	2151	7.4
(18S LilPo)	Foldable	62%	23415	47.3	3267.7	2218	7.2
	Propeller	64%	25040	52.3	3614.9	2288	6.9
		66%	25765	54.6	3774.7	2318	6.8
		68%	26625	57.4	3968.5	2353	6.7
		70%	28295	82.0	4358.6	2420	6.5
		72%	29930	68.8	4759.7	2484	6.3
		74%	31540	74.9	5174.9	2545	6.1
		76%	32765	79.6	5505.2	2591	6.0
		78%	33820	83.1	5746.7	2623	5.9
		80%	34800	88.0	6084.4	2665	5.7
		100%	44660	138.3	9552.2	2977	4.7

## 07 Protective function

#### Start protection

When the power is connected normally, the ESC will first start the self-test. If the self-test is successful, it will run normally after beeping. If the self-test fails, it will not start and the flashing light will act as warning sign.

### Stall Protection

When the ESC detects that the motor is locked, the ESC will completely turn off the output and will not restart the motor. At this time, it is necessary to power on again to clear the error and restart the ESC to restore power output.

#### Current protection

When it detects that the instantaneous current abnormality reaches close to 320A, the ESC will restart immediately, and the output will be turned off if the number of detections reaches 6 consecutive times. After the motor stops, it will return to normal after power on again

### • Throttle signal loss protection

When the ESC detects that the throttle remote control signal is lost for more than 0.25 seconds, it will immediately turn off the output to avoid greater losses caused by the continued high-speed rotation of the propeller. After the signal is restored, the ESC will immediately restore the corresponding power output.

#### Temperature protection

This power system has no temperature protection, and will only send out an alarm when the temperature of the ESC is higher than 110°C. The flashing lights will be 1 long and 3 short, and 1 long and 4 short. When the temperature exceeds 130 degrees, the ESC may be burnt. Upon seeing the prompt, please land immediately

### 1) Connection

Connect the computer and the DataLink data box with a USB cable; ESC---->DataLink data box "yellow gray green"---->"- CH1 CL1 ".

### 2) Operation



### **5** ID set up

If there is no requirement, the default factory ID of the ESC is 1, the throttle channel is 1, and the bus speed is 500Hz

This function is only available for CAN communication ESCs, and the serial port does not have this function. This function can communicate with the flight controller to realize digital throttle. This function requires the additional purchase of DataLink data box

Before using this function, ensure that the computer system is installed with the Microsoft Visual C++ 2013 software in advance to operate.

1) Connection

ESC---->DataLink data box "yellow gray green"---->"-CH1 CL1";

Connect the data box to the computer via USB.

Please remove the paddle to avoid danger upon changing the ID.

For the same aircraft, different ESC IDs and throttles cannot be the same. Otherwise, ESCs with the same ID will be recognized as one ESC upon using the CAN function,

#### 2) Operation



### 6 Fault storage

The ESC has its own fault storage function to store the time during power-on, flight time, and fault time information. This function drastically improves the quality of live and makes it convenient for flight fault analysis. Please note that this function only records the data at the time of failure, and not all flight data.

This function requires the use of DataLink data box, serial port assistant, DataLink software, and USB data cable.

Note: DataLink software can be obtained from Hobbywing official website, dealers, Hobbywing sales, and Hobbywing after-sales.

DataLink data box version requirements, LINK-01.2.15-C or later; serial port assistant requirements, USB to TTL; DataLink software requires a fault storage version, which can be obtained from the official website, WeChat official account or after-sales.

The DataLink box has three power supply methods; USB data cable, serial port assistant, and external power supply cable. You can choose one of the power supply methods, and there is no need to repeat power supply.

Note: For detailed steps, please refer to the DataLink user manual.

1) Connection

Serial assistant ----> DataLink data box "GND 5V TX RX" ----> "- + RX2 TX2";

CAN communication ESC ----> DataLink data box "yellow gray green" ----> "- CH1 CL1", multiple ESCs can be used in parallel.

Note: Upon using multiple ESCs in parallel, the ID and throttle number must be set differently in order for one ESC to be recognized.

Serial communication ESC---->DataLink data box "yellow red green"---->"- 🗆 D", any channel of D1-D8 is acceptable, and it is recommended to use D1 channel first.

### 2) Software operation



Note: This function requires the serial port assistant. Before using it, please ensure that the serial port assistant is in working coditions. If it cannot be used, please replace the serial port assistant and try again.

## **10** After-sale maintenance

In the event that the equipment of the power system is damaged, please contact Hobbywing after-sales customer service immediately. Under the premise of not affecting the performance, make sure that you can use the Hobbywing power system kit accessories for replacement after contacting the customer service. Users are prohibited from configuring accessories by themselves (such as screws, paddle clips, propellers) for replacement.