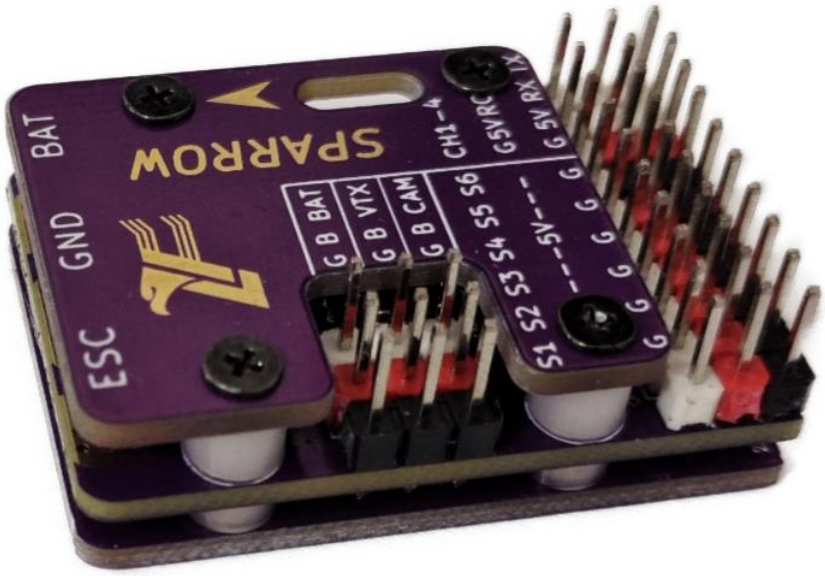
SPARROW 3-OSD

Manual v1.5



WARNING

Please strictly abide by relevant national laws and regulations and fly safely. Before using the FC, you must fully understand the safety details. The equipment and any electronic products on the aircraft cannot be completely reliable. The necessary inspections must be carefully performed before the flight.

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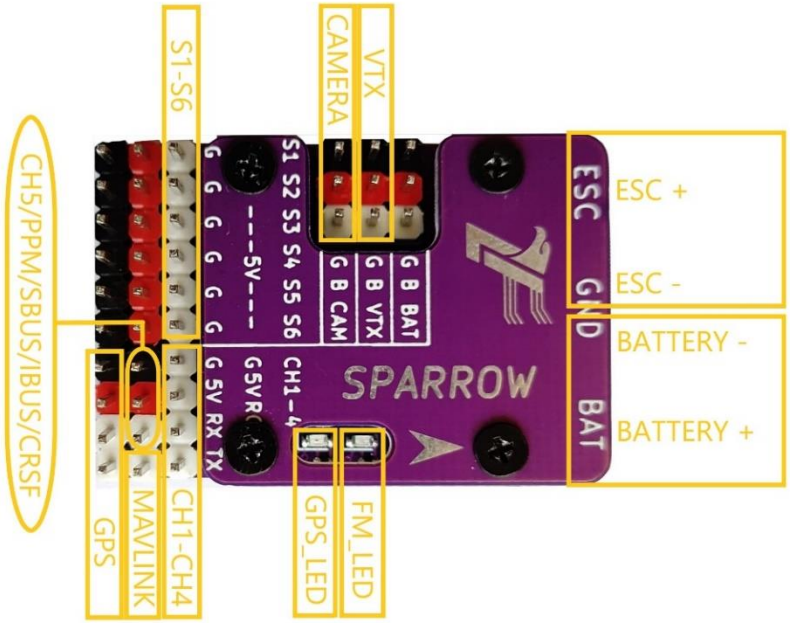
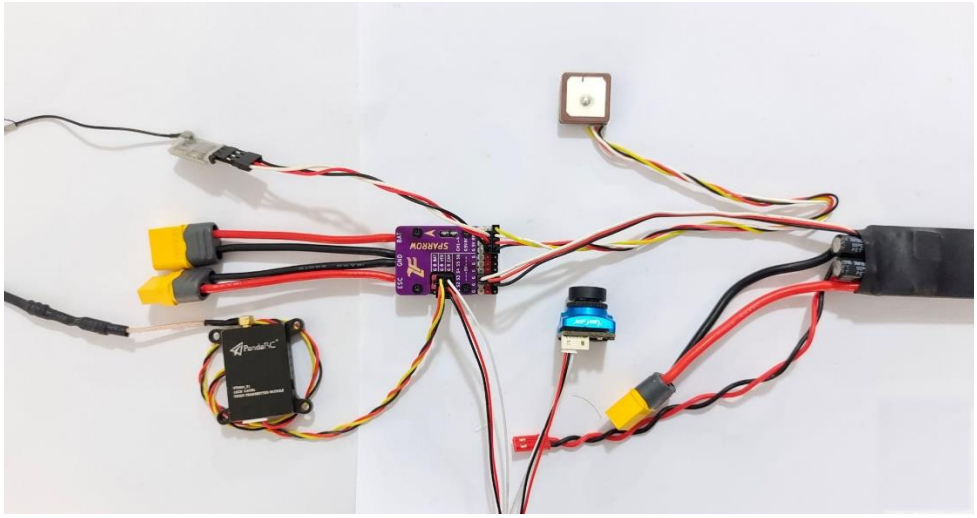
Parameter

- **FC**
  SIZE：37*25*10mm
  WEIGHT：15g
- **POWER**
  FC：5V
  Battery：2-6S
  VTX、Cammera：powered by battery or external BEC
- **RC RECEIVER**
  Protocol：PWM、PPM、SBUS、IBUS、CRSF
  Telem：MAVLINK

Interface

- **PORT**



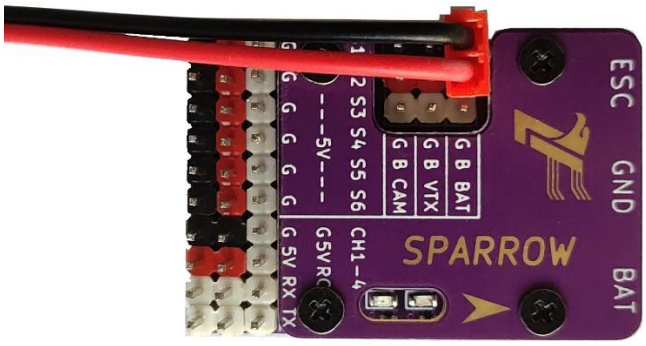


CH1-CH4	PWM CH1-4: AIL、ELE、THR、RUD
RC	PWM CH5:Flight mode channel
	PPM/SBUS/IBUS/CRSF
TX	GPS RX
RX	GPS TX
S1	AIL
S2	ELE
S3	THR
S4	RUD
S5	AUX1
S6	AUX2
CAM	Camera
VTX	VTX
B	VTX,CAM power supply
MAVLINK	Telemetry

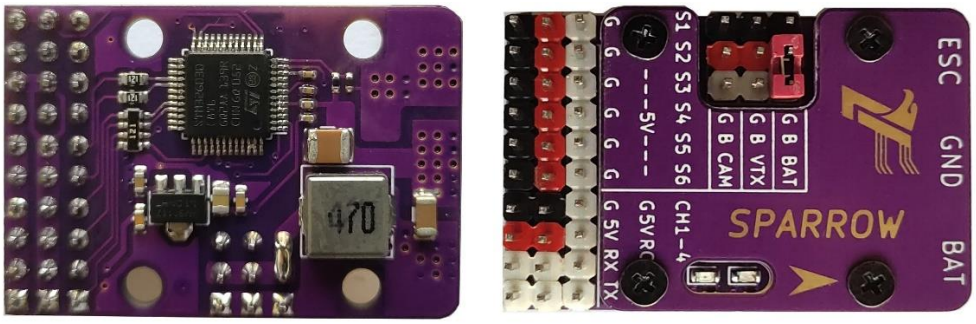
* During the assembly process of the FC, there is no need to over-tighten the screws, which may cause the motherboard to deform!

- **How to power the VTX and camera**

① **External BEC power supply**



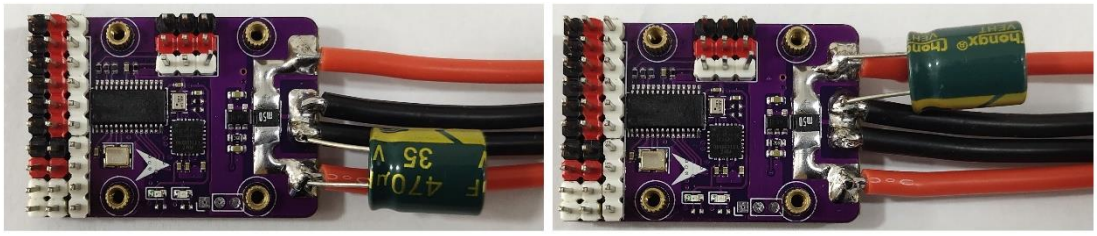
② **Battery powered**



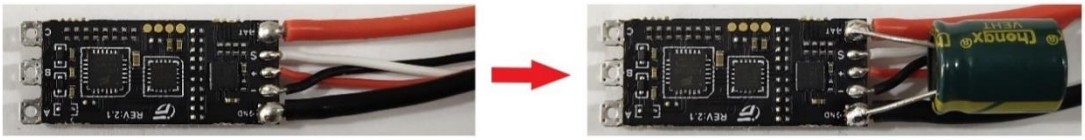
Two ways to use battery

If the battery voltage is higher than the VTX or camera working voltage, must use an external BEC power supply.

When the current is too large and the battery power supply capacity is insufficient, if the image transmission and camera are powered by battery, it may cause the OSD to flicker. At this time, it is recommended to connect a low ESR large capacitor in parallel with the FC, such as 470uf/50V, etc.

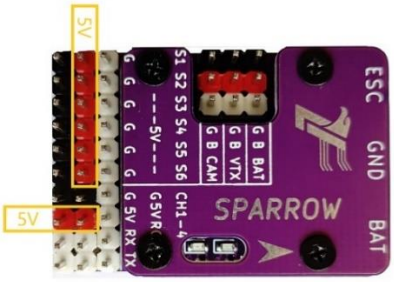


In some ESCs, the battery voltage and 5V-BEC output voltage fluctuate greatly under high current conditions, which will cause certain interference to the FC, such as OSD flickering or even the sensor being affected, resulting in an attitude error. A low ESR large capacitor is connected in parallel with the output terminal of the ESC (the closer the ESC is, the better the effect). If space allows, a capacitor can be connected in parallel at the BAT and ESC terminals of the FC.



- **Flight controller working voltage**

FC is powerd by external 5v BEC.



- **Remote control and receiver**

◐ **PWM**

The flight controller supports 5 PWM inputs, including CH1-4 and RC. The specific settings are that CH1 is AIL, CH2 is ELE, CH3 is THR, CH4 is RUD, and RC is the mode channel. It is recommended to use a 3-SW for the mode channel.

◐ **PPM SBUS IBUS CRSF**

Just connect the signal line to the RC channel, the FC will automatically recognize it, and the mode channel is CH5 by default. Some CRSF may have only two states in CH5, which makes it impossible to switch between the three flight modes. You can select other channels in the OSD settings as the mode channel.

◐ **Calibrate the remote**

Select the <RC CALI> item, when <CFM?> appears, quickly dial the mode switch to complete the calibration. If the calibration fails and the RC cannot be calibrated again, you can turn the roll and pitch stick to the MAX, and then restart the FC , it will automatically enter <RC CALI>, and please keep the offset zeroed before calibration.

◐ **RSSI**

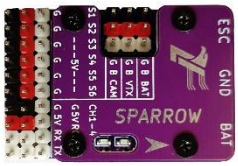
RSSI channel can be selected, and the range of RSSI value is the same as that of other channels.

◐ Tips

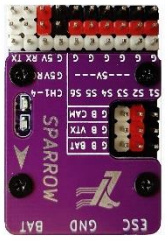
When using the RC, there is no need to set the mixing mode, the user can select the appropriate model in the OSD setting menu; when entering the OSD setting menu, do not limit the range of the sticks stroke.

➢ **InstallDirection**

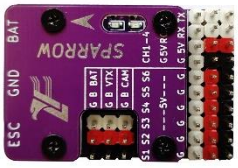
0D



90D



180D



270D

L90D

R90D

The installation direction of the picture points to the head.

Waring: Need to re-calibrate the level after changing the installation direction.

OSD

➢ **MAIN**

1	Flight Mode	10	Speed km/h
2	Flight Time	11	Attitude Line
3	Battary Volatge	12	Flight Height
4	Current	13	Climb Rate
5	Home Distance	14	Travel Distance
6	Return Home Angle	15	Power Consumption mAH
7	Satellite	16	Ail Angle

8	RSSI(SBUS)	**17**	Pitch Angle
9	Throttle	**18**	GPS POS

- **CONTROL OSD MENU**

Enter Menu	Quick switch CH5
Exit	AIL LEFT
Enter	AIL RIGHT
UP/DOWN	ELE UP/DOWN

- **PARAMETERS**

FRAME	T-TAIL、V-TAIL、WING
INSTALLATION	Support 6 installation directions.
ROLL/PITCH/YAW GAIN	Set the gain, the YAW gain only works in ACRO .
ROLL/PITCH/YAW DIRECTION	Set the output directions of servos.
RC CALI	Keep THR to the min,other channels don't have the trim,after *<CFM?>* appears, switch CH5 quickly to complete the calibration.
LEVEL CALI	Before calibration, the FC should be placed horizontally and still; if it has not been calibrated for a long time or the installation direction has been changed, needs to be re-calibrated.
VOL/CURRENT CALI	Set voltage/current offset.
CRUISE SPEED	Flight speed in RTH.
RTH ALT SAFE ALT	In RTH, if the distance is beyond 3 times the circling radius, the min flying altitude is *<SAFE ALT>*. If it is higher than this altitude, it will slowly descend; after approaching the HOME, fly according to *<RTH ALT>* and finally circle at this altitude.
FENCE RADIUS	If the distance exceeds this radius, the RTH mode will be triggered.
RTH RADIUS	Circling radius.
MODE 1/2/3	Three modes corresponding to CH5.
ACRO GAIN	Stability gain in ACRO.
VEL GAIN	The faster the speed, the smaller the required gain, and the larger *<VEL GAIN>* should be.
AUX1/2	Set AUX function.
AUX1/2 DIRECTION	Set the output direction of the AUX.
GPS	Whether to display latitude and longitude.
TELE	MAVLINK baud rate, MAV1-57600, MAV2-115200.
RSSI	Select RSSI channel.
MODE-CH	Select mode channel.
HOS/VOS	Set OSD offset.
LANGUAGE	Chinese and English.

*** When setting the AUX function, RC6-8 means RC 6-8 channels.**

*** < FENCE RADIUS> only works in fence mode, other modes do not have fence function.**

*** After changing the <TELE>, you need to restart the FC.**

- **Flight Summarize**

  After land, OSD will show summarize about flight info.
  Quick switch Flight mode channel(CH5 or CH6) to exit.

- **LED**

GREEN	Quick flash	RTH/ALTHOLD/FENCE
	Flash	MANUL/ACRO
	On	STAB
RED	Flash	GPS NoFix
	On	GPS Fixed
	Off	NO GPS

Flight Mode

How

MAN	The airplane is direct controled by RC.
STAB	Control the angle of airplane,and auto level when no RC input.
ACRO	Gyro mode,lock the current angle when no RC input.
ALT	Hold current height when no ele input.
FENCE	Auto Retun Home when out of fence rage.
RTH	Auto Retun Home.

Assisted Takeoff

ALT/FENCE Mode

Step1: Push the throttle to the throttle position you want.

Step2: Throw away and auto climb to 20m.

RTH Mode

Step1: Push the throttle to the throttle position you want.

Step2: Shake your airplane or give the airplane an initial speed , until motor start.

Step3: Throw away and take off.

Throttle control

① In STAB, MAN, ACRO and ALT mode, throttle is direct controlled by RC.

② In RTH when throttle channel at zero postion, it will be auto controlled by FC according to speed parameter; when throttle channel position upper then auto speed throttle, it will controlled by RC.

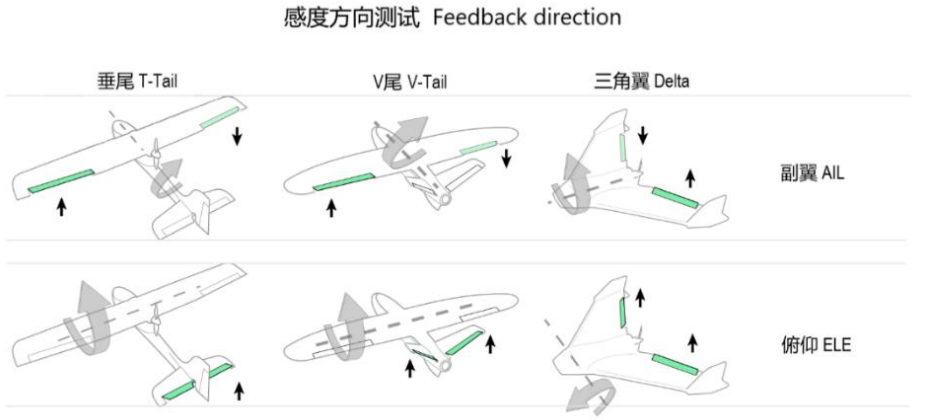
③ In FENCE mode, before triggering the RTH， throttle is direct controlled by RC.

Throttle differential

When the AUX is set to throttle, the YAW channel controls the throttle differential.

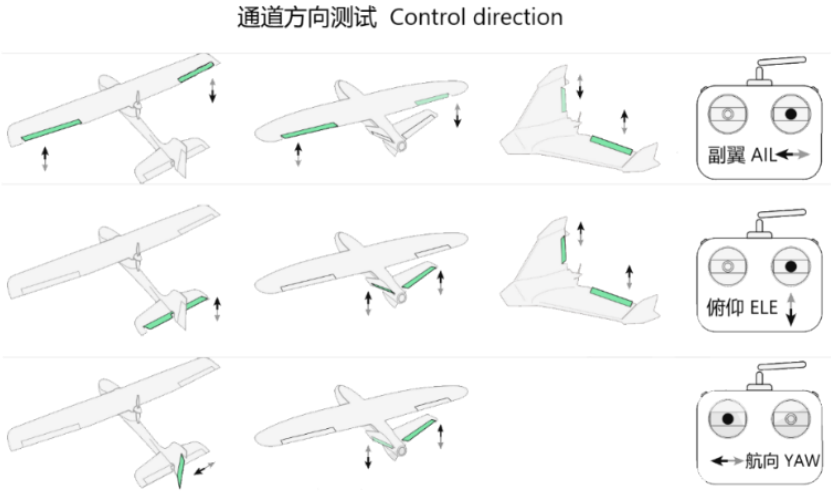
Preflight inspection

➢ Feedback direction



默认不支持航向通道自稳. NO Stabilization in YAW channel.

➢ RC control direction



* If the control direction is wrong, you can set the channel output reverse in the RC.

➢ FailSafe

Receiver type	mode
PWM	Make sure the CH5 can switch to RTH mode when lose connection
PPM	
IBUS	
CRSF	
SBUS	Can auto switch to RTH mode

Waring: make sure you have check failsafe mode before takeoff.

➢ Armed

With GPS	After GPS fixed, Armed
No GPS	Armed after power on

➢ Set throttle range of ESC

Step1: Switch to manual mode, push throttle channel to max position.
Step2: Power on(longer waiting time than directly connected receiver).
Step3: After ESC Beep, please push throttle channel to zero position.