

Features
AIO 4IN1 Crazybee F4 Lite flight controller built-in 5.8G VTX
Extreme light 1S 65mm Brushless whoop only 20g
Runcam Nano3 The lightest 1/3 CMOS 800TVL Camera
Smooth and powerful
Compatible for 1S Lipo/LIHV
Camera Angle adjustable

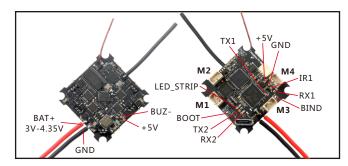
Ы	peci	пса	110

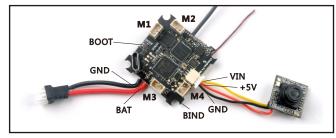
Brand Name: Happymodel
Item Name: Mobula6 1S 65mm Brushless whoop drone BNF version
Wheelbase: 65mm
Size: 80mm*80mm*37mm
Weight: 20g
Receiver option:
Internal SPI Frsky version (Compatible with ACCST D8/D16, Recommend D8 mode)
Internal SPI Flysky version(Compatible with AFHDS and AFHDS-2A Flysky transmitter)
Internal SPI DSM2/DSMX version(Compatible with DSM2/DSMX radio transmitter)
Motor speed option:
0802 KV25000(Race Edition)
0802 KV19000(Regular Edition)

### Package includes

Item Name	Qty
Mobula6 1S 65mm whoop Drone Frame	1
SPI Receiver Option1: Crazybee F4 Lite FC built-in Frsky SPI D8 RX	1
SPI Receiver Option2: Crazybee F4 Lite FC built-in Flysky SPI RX	7 <sup>-</sup>
SPI receiver option3:CrazybeeX DXS V1.0 FC built-in DSM2/X SPI RX	4
0802 KV19000 or KV25000 brushless motor	1
Gemfan 1219-3 Propellers(4cw+4ccw)	1
Runcam Nano3 1/3 CMOS 800TVL camera	1
5.8G 25mw 40ch vtx (Flight controller built-in)	4
1S 300mah 30C LiHV Battery	1
1S Lipo/LIHV USB Charger	1
Propeller disassemble tool	1

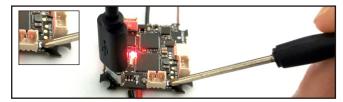
## Flight controller connection diagram





# **Binding procedure**

1.Powering the Mobula6 then the red LED at the bottom of the flight controller will blinking slowly. And then press the bind butoon , the red led will getting to be solid , this indicate the receiver is in bind mode.



Plug the USB and go to the CLI command tab in te betaflight configurator, then type "frsky\_bind" (Betaflight 3.5.7 firmware), the red LED will getting to be solid ,and it means the receiver is in bind mode. For betaflight 4.0.X the bind code is "bind\_rx\_spi" and for Betaflight 4.1.X or 4.2.X version the bind code is "bind\_rx"

Entering CLI Mode, type 'exit' to return, or 'help' # # Building AutoComplete Cache ... Done! " # frsky\_bind Binding...

2.Turn on your Frsky Taranis transmitter, and move to BIND OPTION from SETUP MENU, Choose receiver mode D16 or D8 according to your Betaflight receiver configuration (Frsky X = D16 mode, Frsky D=D8 mode)we recommend use D8 mode



3.ENT [Bind] to binding with the Mobula6 ,the red LED at the bottom of the flight controller will blinking slowly ,this indicate binding successfully, and then exist binding mode of your Frsky transmitter, the red LED at the bottom of the flight controller will getting to be solid again, this indicate working normal.

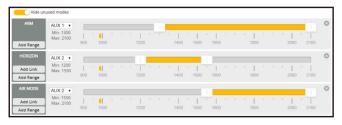
## **Receiver configuration**

Please set Receiver mode to be SPI RX Support from the Configuration tab of the Betaflight Configurator, then select FRSKY\_X Provider for FRSKY D16 MODE or Select FRSKY\_D Provider for FRSKY D8 MODE, don't enable Serial RX since the CRAZYBEE Flight controller is integrated SPI BUS Receiver

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200 🔻		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART1	115200 •		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART2	115200 •		Disabled • AUTO •	Disabled • AUTO •	TBS SmartAuc • AUTO •
Receive	er				
SPI R	K support		<ul> <li>Receiver Mode</li> </ul>		
Note:	The SPI RX provider	will only v	vork if the required hardv	vare is on board or conn	ected to an SPI bus.
FRSK	Y_X		<ul> <li>SPI Bus Receiver P</li> </ul>	rovider FRSKY	D16 MODE
Receive	er.				
SPI R)	<pre>&lt; support</pre>		Receiver Mode		
Note:	The SPI RX provider	will only v	vork if the required hard	ware is on board or conn	ected to an SPI bus.
FRSK	(_D		<ul> <li>SPI Bus Receiver P</li> </ul>	rovider FRSKY	D8 MODE

### Arm/Disarm the Motor

1. The Default Arm/Disarm switch for Mobula6 is AUX1(Channel 5), and you can also customize it with Betaflight Configurator.



2. Turn on the Frsky transmitter (Use X9D+ as an example) and move to the MIXER interface, Set "SA" or "SB" switch etc. for Ch5 to ARM/DISARM the motor.



3. The default channel map for Mobula6 Frsky version is TAER1234, please make sure your transmitter is matched, otherwise it will can't be armed. Toggle the AUX1 Switch ,the Green LED on the flight controller will getting to be solid, this indicates the motor was armed . And also you can found "Armed" displayed on your FPV Goggles or the FPV Monitor. Please make sure keep the Mobula6 level before arming .Be careful and enjoy your flight now !



# VTX Bands and Channels setup

Frequency and	channel	frequer	ncy table	<b>e</b> :				
FR CH	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Band1(A)	5865M	5845M	5825M	5805M	5785M	5765M	5745M	5725M
Band2(B)	5733M	5752M	5771M	5790M	5809M	5828M	5847M	5866M
Band3(E)	5705M	5685M	5665M	5665M	5885M	5905M	5905M	5905M
Band4(F)	5740M	5760M	5780M	5800M	5820M	5840M	5860M	5880M
Band5(R)	5658M	5695M	5732M	5769M	5806M	5843M	5880M	5917M

## There are 2 ways to switch the vtx channels:

1.If we need to use Channel 5705 then we should Go to Betaflight CLI,type the command: Set VTX\_band=3  $\,$ 

Set VTX\_channel=1

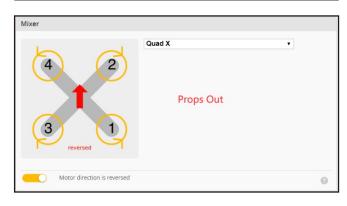
save

2.Disarm the Mobula6 and then move the stick of the transmitter(THR MID+YAW LEFT+PITCH UP)to enter OSD Menu,Enter to Features,then enter to VTX SA to set VTX Band and channel

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	115200 🔹		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART1	115200 •		Disabled • AUTO •	Disabled • AUTO •	Disabled • AUTO •
UART2	115200 •		Disabled • AUTO •	Disabled • AUTO •	TBS SmartAuc • AUTO •



Mixer type and ESC/motor protocol



ESC/Motor Features	
DSHOT600  ESC/Motor protocol	0
MOTOR_STOP Don't spin the motors when armed	
Disarm motors regardless of throttle value (When ARM is configured in Modes tab via A	AUX channel)
5 Disarm motors after set delay [seconds] (Requires MOTOR_STOP feature)	
4.5 Add Motor Idle Throttle Value [percent]	Ø

## Default PID settings for Betaflight 3.5.7

PID Settings			Filter Settin	ngs								
	Proportiona	sl	Integral		Derivative	Feedforwar	đ	RC Rate		Super Rate	Max Vel [deg/s]	RC Expo
Basic/Acro												
ROLL	85	¢	100	\$	85	\$ 140	\$	] 1	00 \$	0.70 \$	662	] 0.00
PITCH	80	\$	100	\$	85	\$ 140	\$	5		0.70 \$	662	5
YAW	120	\$	100	\$	0	\$ 140	\$	1	00 \$	0.70 \$	662	0.00



## ESC Check and Flash firmware

1.Download New release Blhelisuite from:

https://www.mediafire.com/folder/dx6kfaasyo24l/BLHeliSuite

2.Plug the usb and connect the flight controller to computer



3.Open the Device Manager of your computer, find the Ports, please make sure the Com port Serial Number is under 255, otherwise it will can't connect to the BLHELISUITE. You can change the port serial number like the bellowing step :

scycle Bin	Monit     Monit     Netwin     Ports     Ports     Proce     Sound     Syste	ors ork adapters (COM & LPT) Microelectro ssors I, video and m devices		M Port (COM436 s	0	1000		tronis Virt	Driver   Bits pe		9600	operties.	•
	ngs for COH43 FIFO buffers (req lower settings to higher settings f	ures 16550 c correct con	compatible UAR					OK Cance Default	-	Stop bits: v control:	1	Restore	Defaults
Receive Bu	ffer: Low (1)				-1	High (14)	(14)		_	_		J	
Iransmit Bu	ffer: Low (1)	1	, ,	e.	-1	High (16)	(16)						
COM <u>P</u> ort Num	iber: COM25	•								<u> </u>		ок	Cancel

4.Open the BLHELISUITE, Select SILABS BLHeli Bootloader (Cleanflight) from the third tab on the top side. Then Select the right Serial com port and Click connect. You can also Flash the new release BLHeli\_s firmware via the BLHEILISUITE, the firmware Target is "O-H-05"

SiLabs ESC Setup	ESC over	view	Motors	: I	Make interfac	es				
ESC# 1 - Name		for Mu	Firmwa Ilticopter S Revision:	Motors	t Misc					
Startup Power	> @	Motor I	Direction Reversed	- , @	PPM Min	Throttle 1148	>	Startup E	Beep Volu 40	me >
Temperature Prote	ection >	Demag	Compensati Low	-	PPM Max	Throttle 1832	>	Beacon/S	ignal Volu 80	Jme
ow RPM Power P	rotect	Motor 1	Timing Medium	>	PPM Cent	ter Throttl 1488	le >	Beacon D	elay L <mark>O minut</mark> e	5 >
		Fla	ash firmw	are	Brake On	Stop Off		lick check letails of th		
Read Setup	🕞 Write	Setup	😚 Flash BLH	ieli 📝	Flash Other					
t: COM 3 🗸 Bau	d: 115200		Disconnect	Multiple	ESC / Maste	er#1		de	*	

# Flight controller firmware update

1.Install latest STM32 Virtual COM Port Driver http://www.st.com/web/en/catalog/tools/PF257938

2.Install STM BOOTLOAD Driver (STM Device in DEU MODE)

3.Open Betaflight configurator and choose firmware target "Crazybee F4  $\ensuremath{\mathsf{F4}}$  , then select the firmware version.

4.There are 2 ways to get in DFU Mode: 1). solder the boot pad and then plug USB to computer 2). loading betaflight firmware and hit "flash", then it will getting into DFU Mode automatically. 5.Open Zadig tools to replace the drivers from STM32 Bootloader to WINUSB Driver. 6.Reconnect the flight controller to the computer after replace driver done, and open Betaflight Configurator, loading firmware and flash.

Driver	STTub30 (v3.0.4.0)	-	WinUSB (v6.1.7600.16385)	Hore Informatio WinUSB (lbusb)
USB ID	0483 DF11			ibusb-win32
WCID <sup>2</sup>	×		Replace Driver	WinUSB (Microsoft)

# "Flip over after crash" procedure

Set one channel of your radio transmitter to activate the Flip over function in the Mode tab of Betaflight configurator.

The default Switch for Activate "Flip" is AUX4(Channel8)

Add Link         Mm: 1300         I	
Add Range 800 1000 1200 1400 1500 1000 1600 2000	2100