

## 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

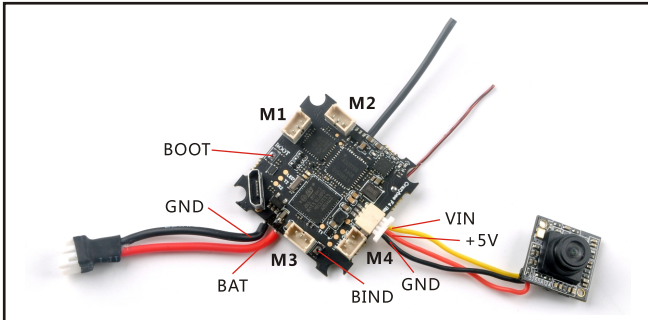
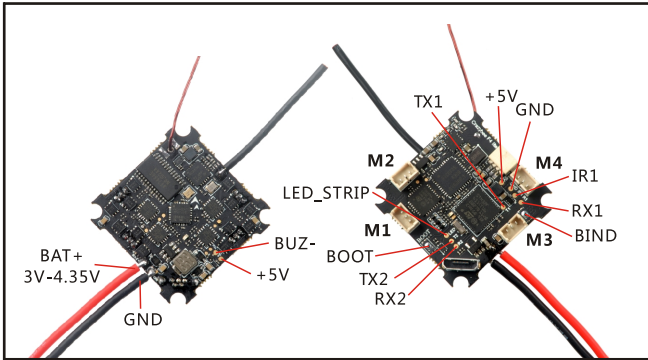
## Specifications

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)
Motor speed option:
SE0802 KV25000(Race Edition)
SE0802 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	
SE0802 KV19000 or KV25000 brushless motor	4
Gemfan 1219-3 Propellers(4cw+4ccw)	1
Runcam Nano3 1/3 CMOS 800TVL camera	1
5.8G 25mw 40ch vtx (Flight controller built-in)	1
1S 300mah 30C LiHV Battery	4
1S Lipo/LiHV USB Charger	1
Propeller disassemble tool	1

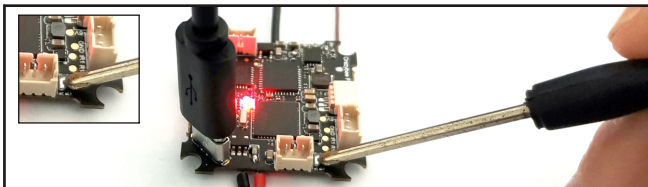
### Flight controller connection diagram



## Binding procedure

1. Betaflight 3.5.7 version(Original firmware out of box) binding procedure: Press and hold the bind button then powering the Mobula6, the Red LED at the bottom of the flight controller will be blinking fast, this indicate the receiver is in bind mode .

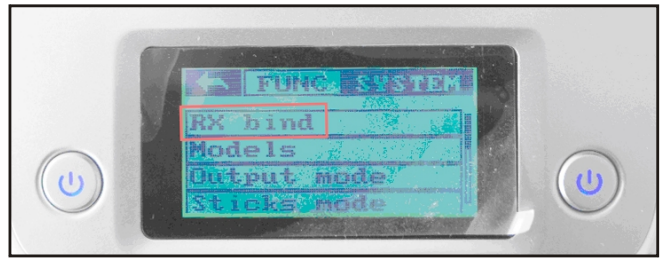
Betaflight firmware later than 4.0.1(include)binding procedure: Powering the Mobula6 first, then Press the bind button for 1 second, the red Led at the bottom of the flight controller will be blinking fast, this indicate the receiver is in bind mode.



2. Another simple way to bind with the Flysky transmitter is : plug the usb and move to the CLI Command , then type bind code "bind\_rx\_spi"(for betaflyght 4.0.1~4.0.6) or type bind code "bind\_rx"(for betaflyght 4.1.0~4.1.1), the receiver will getting into bind mode, and then make your Flysky transmitter to bind mode, the LED at the bottom of the flight controller will getting to be solid if bind successfully. (Betaflight 3.5.7 firmware not support these bind code)







```
$M>de~000!000000) 00000000000$M> n000000000e
Entering CLI Mode, type 'exit' to return, or 'help'

# bind_rx_spi
Binding...
```



### Receiver configuration

Please set Receiver mode to be SPI RX Support from the Configuration tab of the Betaflight Configurator, then select A7105\_Flysky\_2A Provider for AFHDS-2A Protocol Radio transmitter or Select A7105\_Flysky Provider for AFHDS Protocol Radio transmitter, don't enable Serial RX since the Crazybee F4 lite 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 ▾

Receiver

SPI RX support ▾ Receiver Mode

**Note:** The SPI RX provider will only work if the required hardware is on board or connected to an SPI bus.

A7105\_FLYSKY\_2A ▾ **Flysky AFHDS-2A**

Receiver

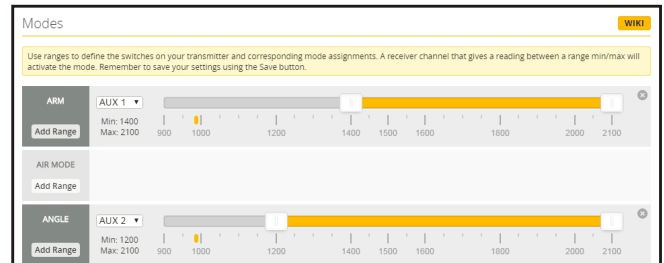
SPI RX support ▾ Receiver Mode

**Note:** The SPI RX provider will only work if the required hardware is on board or connected to an SPI bus.

A7105\_FLYSKY ▾ **Flysky AFHDS**

### Arm/Disarm the Motor

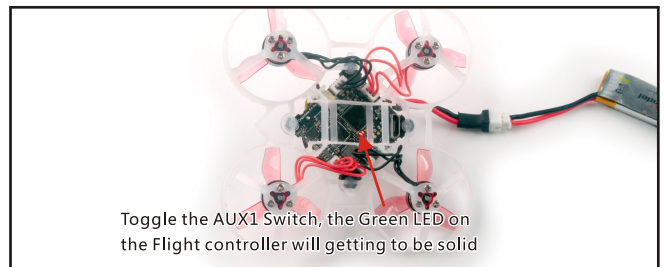
1. The Default Arm/Disarm switch for Mobula6 is AUX1(Channel 5),and you can also customize it with Betaflight Configurator.



2. Set Arm/Disarm switch for your Flysky Radio: Move to the Aux.channels interface, Set "SWA" or "SWB" or "SWC" switch etc. for Ch5 to ARM/DISARM the motor.



3.The default channel map for Mobula6 Flysky version is AETR1234, 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 Mobula6 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 frequency table:

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	5645M	5625M	5605M	5585M	5565M	
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

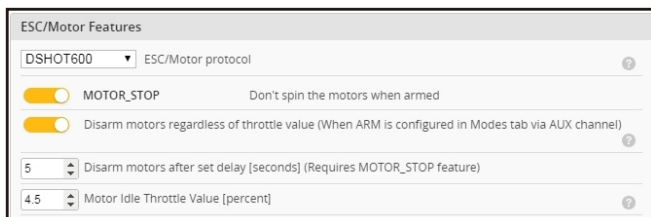
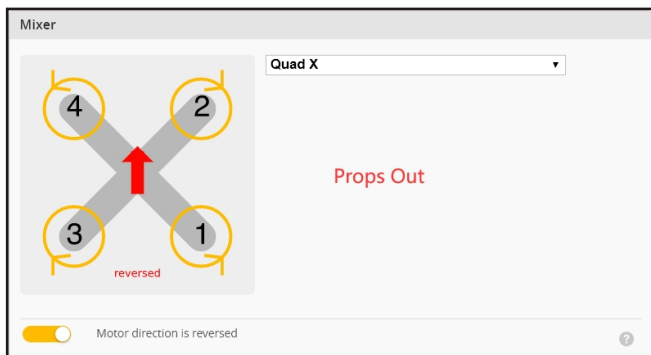
save

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	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/> Disabled	<input type="checkbox"/> AUTO	<input type="checkbox"/> Disabled	<input type="checkbox"/> AUTO
UART1	<input type="checkbox"/> 115200	<input type="checkbox"/> Disabled	<input type="checkbox"/> AUTO	<input type="checkbox"/> Disabled	<input type="checkbox"/> AUTO
UART2	<input type="checkbox"/> 115200	<input type="checkbox"/> Disabled	<input type="checkbox"/> AUTO	<input type="checkbox"/> Disabled	<input type="checkbox"/> TBS SmartAuc



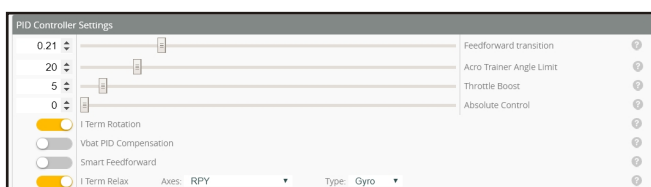
## Mixer type and ESC/motor protocol



## Default PID setting

Betaflight 3.5.7 Default PID settings:

Profile	Rateprofile	Copy profile values						
Profile 1	Rateprofile 3							
PID Settings		Filter Settings						
	Proportional	Integral	Derivative	Feedforward	RC Rate	Super Rate	Max Vel (deg/s)	RC Expo
ROLL	85	100	85	140	1.00	0.70	662	0.00
PITCH	80	100	85	140	0.70	0.70	662	0.00
YAW	120	100	0	140	1.00	0.70	662	0.00

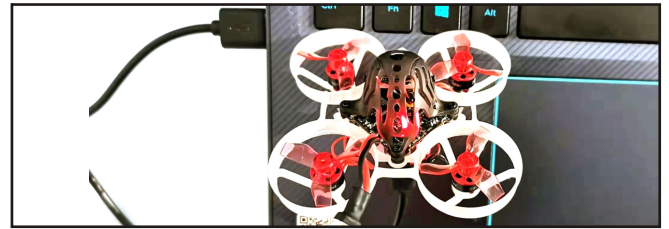


## ESC Check and Flash firmware

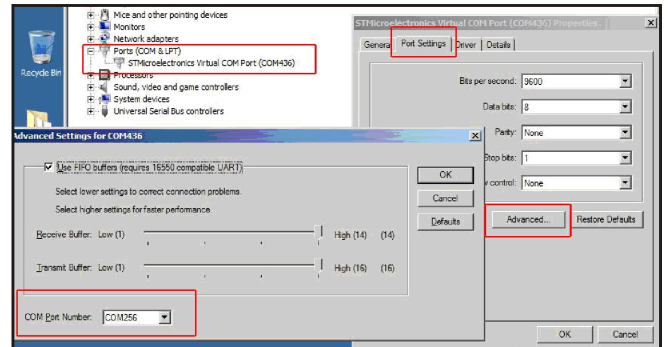
1.Download New release BLHeliSuite from:

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

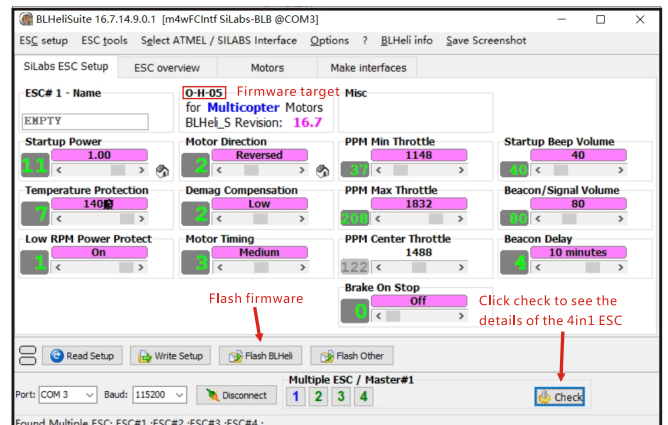
2.Plug the usb and connect the flight controller to computer



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 following step :



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 BLHELISUITE, the firmware Target is "O-H-05"



## Flight controller firmware update

1.Install latest STM32 Virtual COM Port Driver

<http://www.st.com/web/en/catalog/tools/PF257938>

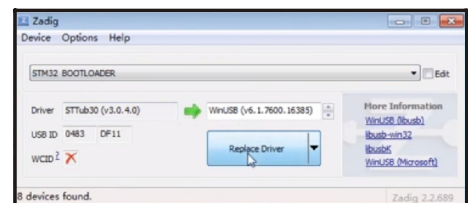
2.Install STM BOOTLOAD Driver (STM Device in DFU MODE)

3.Open Betaflight configurator and choose firmware target "Crazybee F4 FS(Legacy)", 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 betafight 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.



## "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)

