

Flytower PRO Instructions



Instructions for using

1, Please install ANT (must be done) before debugging or testing VTX (and OSD), or lead to VTX not working properly.

2, please use proper tools to install Flytower .It is easy to damage the PCB components by using sharp tools. (warning: Bear in mind that screws do not install too tight between every layer, so as not to destroy the PCB and electronic components).

3, When you debug or test flight control Please remove all the propeller; Try not to test indoors, So as not to cause safety accidents. Install the propeller before a test flight, please check again.

4, Please check and adjust ESC plate welding, thus brings all the losses and problems, or you should face the consequences.

5, Please do not fly your drone near the crowd, for all the losses from the crashed aircraft, you should face the consequences.

6, For your safety, please do not use more than 4s battery, Using more than 4s battery would cause safety



risk, we will not undertake any responsibility.

7, Before power on, please check the positive and negative pole again to make sure whether there is a

short circuit .(you also have to check that whether there is short circuit between your motor cables and

frame).

8, Please use original screws and fixings to install Flytower.

	PDB	Integrated
	Battery Monitoring	Integrated
	FC Power	Integrated
	Operating Voltage	2-4S Lipo
	Maximum continuous operating current	4*40A
4 in 1 ESC	Maximum instantaneous operating current	4*45A(5 Seconds)
	Oneshot 125/42/ Dshot 150/300/600	YES
	BlheliSuite Configurable	YES
	Firmware Version	BLHeli_S/Dshot 150/300/600
		16.6(A_H_15/L_H_0)
	Board Size	36*36mm
	Weight	10g
	Firmware Version	Betaflight:3.1.7
		OMNIBUS(Flytower PRO F3)
		OMNIBUSF4SD(Flytower PRO F4)
	Configure	Betaflight
FC&VTX	VTX Power	OFF/25/200/400mW(MAX 800mW)
Board	СН	48CH
	OSD Firmware	Betaflight OSD
	Video Camera Voltage	Any stand by 5V Video Camera
	Board Size	36*36mm
	Weight	11.4g
	Any Board weight	21.4g
	Total weight	28.7g
Flytower	Installation height(Add air-cooling fin)	15mm/20mm
F3/F4 PRO	Screws	M3*18mm
	Recommended Rack Plate Thickness	Not more than 3mm (3mm above the
		appropriate extension of the screw)

Product specifications

The Flytower PRO F3/F4 board was designed basing on OMNIBUS/OMNIBUSF4SD (Betaflight) FC and highly integrated with OSD,BEC,4 in 1 BLHeli_S/Dshot 600 ESC and VTX with audio (OFF/25/200/400mW).It gives you all the features what you need in FPV, which makes you easily get into FPV racing.

- ★ Practical Easy to access connectors
- ★ Configurable Choose to use connectors
- ★ Stackable Mount our 4 in 1 ESC
- ★ Compact Only 36x36x15mm.(Add air-cooling fin MAX 36*36*20MM)
- ★ Weight 28.7 grams and 2 stack boards
- ★ Professional Symmetrical, Neat and Tidy and Easy to install in any racing drone
- ★ 36x36mm board with 30.5mm mounting holes
- ★ STM32 F405 MCU(Flytower PRO F4), Runs Betaflight firmware(supported from V3.1.7)
- ★ STM32 F303 MCU(Flytower PRO F3), Runs Betaflight firmware(supported from V3.1.7)
- ★ SD card slot
- ★ Use MPU6000 as Acc & gyro over SPI Bus
- ★ STM32 controls OSD chip over SPI in DMA mode, less CPU using, faster rate
- ★ Micro USB socket
- ★ 1x 4pins JST-SH sockets (PPM, PWM, SERIAL RX, GPIO, ADC, 3V, 5V, GND)
- ★ The on-board pins are easily connected to our next 4 in 1 ESC & PDB board
- ★ Internal VTX with audio (48CH) (OFF/25/200 / 400mW adjustable power video transmission)
- ★ 1x 4pins JST-SH sockets with BUZZER & WS2811 RGB LED
- ★ 1x 4pins JST-SH socket for Video and Audio transmission



- ★ 1 IPX sockets easy connect the external antenna
- ★ 4x 3 Pads for motor output
- ★ 1x2 Pads for batter in easy solder

How to solder and Install the Flytower PRO

Weld and Install the Flytower PRO

When you receive the product and open the package, see the ESC board as shown below, you need to follow the instructions of the following tutorial .You

have to step by step and you will easily complete your work of welding.



1, Please change the length of the power supply cable to fit your need, and we recommend to use the cable of# 14 AWG, and peel off the outer skin of the cable, the length of the metal is about 3-5mm, and twist the peeled metal parts, then you could add solder to the stripping of the power cord which can make it more stable.







2, Add solder to both sides of the pads of ESC board and allow it to form and penetrate solder. And add

the appropriate solder to the motor pad.



3, Solder the power supply cable, as shown in the figure below and position the solder, and you are ready

to change the length of the motor cable.









4, Install 4 motors and the mount the ESC board with the power supply cable to the frame. Then add the

solder to the motor cable and solder it with the ESC board as shown below:



(Remember to add the solder to motor cables when the solder is installed. You have to

use the standard screws which is in the box to avoid damaging the ESC board in the process of welding)

Before the welding is completed



After the welding was finished





Warning :

When you are ready to solder the ESC board, you must install the screw bracket as indicated by the yellow arrow, as shown below to ensure that the ESC plate is not damaged during the solder process.





5. When the above solder is completed, please use the multimeter's ohm file on-off function to check whether there is a short circuit between each pad, you need to carefully check the reliability of the solder, to avoid short-circuit which will cause the stop working of your motors, even damage your ESC board.

Betaflight



https://github.com/Betaflight

The hardware connection diagram

1,4 in 1 Board





VBAT

2,FC board TOP



www.exuavrc.com



3,FC board BOTTOM



BOOT BOTTOM







4,Cable define



How to use the onboard USB port updated firmware in GUI on windows

To flash the firmware you have to enter the so called DFU mode. On Windows 10 I had to use a tool called Zadig (download and start it) to be able to switch drivers for DFU mode to work. In order to switch drivers you have to take the following steps.





- 🗆 X
✓ ☐ Edit
More Information WinUSB (libusb)
libusb-win32 libusbK WipUSB (Microsoft)

8 devices found.

- Push BOOT button on the flight controller.
- Plug-in the USB cable (the red LED should not be as bright as normally).
- Fire up Zadig and hit "Options" and then "List All Devices".
- From the list choose "STM32 BOOTLOADER".
- Under "Driver" choose "WinUSB" on the right and hit "Reinstall Driver".
- Close Zadig, disconnect the flight controller, close all Google Chrome instances. More detailed tutorials are connected as follows:

https://www.dropbox.com/s/7rn0eagt4o5e4i7/how%20to%20%20install%20%20%20the%20%20DFU%20%20divice%20%2 0and%20%20no%20%20use%20%20the%20boot%20bottom.xls?dl=0

Schematic drawing software settings

How to use and upgrade FC firmware

Flytower PRO F4 :

DMNIE	USF4SD	•
.1.7 -	OMNIBUSF4SD - 10-04-20	017 18:36 (sta 🔻
	No reboot sequence	
	Full chip erase	
) Manual baud rate 25	6000 •
	Show unstable releases	

NOTE:Because the 3.1.7 version of the firmware of S.BUS function has some bugs , you have to wait for the 3.2 version of OMNIBUSF4SD to fix all of the problems, So we provide you with the default version to fix this bug of the firmware. The link as follow: https://www.dropbox.com/s/alyaq0wxyix6wit/Betaflight_3.1.7_OMNIBUSF4SD-PRO.hex?dl=0

Flytower PRO F3 :



MNIBUS			•
.1.7 - OMNIE	US - 10-04-20	17 18:36 (stable) 🔻
Nor	eboot sequence	9	
Full o	hip erase		
🔵 Man	ual baud rate	256000 •	
Shov	v unstable relea	ases	

How to set S.BUS/PPM/DSMX RC IN

Flytower PRO F3 :

Ports

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset. Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.				
Port Identifier	Configuration	Serial Rx	Telemetry Output	
USB VCP	MSP 115200 T	Serial RX	Disabled V AUTO V	
UART1	MSP 115200 V	Serial RX	Disabled • AUTO •	
UART2	MSP 115200 V S.BUS Port	Serial RX	Disabled	
UART3	MSP 115200 V	Serial RX	Disabled V AUTO V	

Flytower PRO F4 :



Ports

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset. Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you

Port Identifier	Configuration	Serial Rx	Telemetry Output
USB VCP	MSP 115200 ▼	Serial RX	Disabled v AUTO v
UART1	MSP 115200 V	Serial RX	Disabled v AUTO v
UART3	MSP 115200 V	Serial RX	Disabled V AUTO V
UART6	MSP 115200 V	Serial RX	Disabled V AUTO V

S.BUS PORT

Serial-based receiver (SPE	KSAT, S Receiver Mode	
Note: Remember to configure feature.	ure a Serial Port (via Ports tab) and choose a Serial Receiv	er Provider when using RX_SERIAL
SBUS	 Serial Receiver Provider 	
RSSI (Signal Strength)		(
RSSI_ADC Analog	g RSSI input	



	a sea line sea a	the star same trug has	w 1964	
S	BETAFLIGHT CONFIGURATOR 18.5	25.5 V 👸	Image: Second	Disconnect
2017-01-04 2017-01-04 2017-01-04 2017-01-04 2017-01-04	I @ 13:54:57 – MultiWii API version reco @ 13:54:57 – Hight controller info, ide I @ 13:54:57 – Running firmware releas I @ 13:54:57 – Board: OMNI, version: Q @ 13:54:57 – Unique device ID receive	elved - 1.23.0 httifier: BTFL, version: 3.1.0 sed on: Dec 20 2016 21:50:35 d - 0x3b002e5433571120323237	feature.	Hide Log
	Note: Some of the features of the more, because they have been more.	firmware are not shown in this list any oved to other places in the configurator.	GPS GPS for navigation and telemetry	0
~ ث ش	INFLIGHT_ACC_CAL	In-flight level calibration	NMEA Protocol Auto-detect Ground Assistance Type	
da	SOFTSERIAL	Enable CPU based serial ports 👔	0.00 CMagnetometer Declination [deg]	
8	SONAR	sonarOSD enable	20	
A	TELEMETRY	Telemetry output	3D Deadband Low	
020	3D	3D mode (for use with reversible ESCs)	1514 🗘 3D Deadband High	
f t			1460 \$ 3D Neutral	
::::	DISPLAY	OLED Screen Display	50 \$ 3D Deadband Throttle	
	BLACKBOX	Blackbox flight data recorder 🕜		
	CHANNEL_FORWARDIN	IG Forward aux channels to servo outputs	Misc	
	TRANSPONDER	Race Transponder 🕜	Craft name	
	AIRMODE	Permanently enable Airmode		
	esc_sensor	On Screen Display OSD debug/set USSE NSS ESC gA telemetry as sensor		
				Save and Reboot
Port utiliza	tion: D: 12% U: 1% Packet error: 0	I2C error: 1 Cycle Time: 138 CPU L	.oad: 22%	1.8.5

Voltage Sensor, Current sensor Calibration data:

Voltage data = 112;

Current data = 195:

Battery Voltage
VBAT Battery voltage monitoring
Onboard ADC • Battery Meter Type
3.3 🗘 Minimum Cell Voltage
4.3 t Maximum Cell Voltage
3.5 🗘 Warning Cell Voltage
112 🗘 Voltage Scale
1.4 Battery Voltage
Current Sensor
CURRENT_METER Battery current monitoring
Onboard ADC Current Meter Type
195 🗘 Scale the output voltage to milliamps [1/10th mV/A]
0 Constant of the second of th
0.00 Battery Current
Enable support for legacy Multiwii MSP current output



Elements	Preview (drag to change position)	Logo: 🤍 Video Format
Rssi Value		● AUTO ● PAL ● NTS
🔍 Main Batt Voltage		
J Crosshairs	S BETA LA	HT Units
🔍 Artificial Horizon		IMPERIAL O METRIC
🔍 Horizon Sidebars	-> -> -> -> -> -> -> -> -> -> -> -> -> -	
🔍 Ontime		Alarms
🔍 Flytime	C. Carrier	20 🗘 Rssi
C Flymode	S. A.	2200 Capacity
Craft Name		
Throttle Position	. 4 2 . 0	8 4 1 1 1 1 Minutes
Vtx Channel	v 16.8 STAB #	4 : 1 1 100 🗘 Altitude
Current Draw		
Mah Drawn		
Gps Speed		
Gps Sats		
Altitude		
Did Roll		
Pid Pitch		
Did Yaw		
Dever Dever		

ESC use and upgrade firmware

		Connect
7-06-03 @ 16:37:22 Running - OS: WIndows, Chrome: 58.0.3	029.110, Configurator: 1.0.14	
Welcome to BLHeli - Configu	rator, a utility designed to simplify updating and configuring of you	r ESCs.
sclaimer e application supports ESCs running BLHeli for Atmel, Heli for SiLabs and BLHeli_S.	Contributing If you would like to help make BLHeli Configurator even better you can help in many ways, including:	Open Source / Donation Notice
pported.	Answering other users questions on the forums	source and is available free of charge to all users.
ouid you run into any problems, make sure to use the Save Bug Log button and submit a new issue via GItHub.	Submitting Issues with detailed description	Configurator useful, please consider supporting its
plication source code can be downloaded from here	Testing the application on your hardware	development by donating.
test CP210x Drivers can be downloaded from here test STM USB VCP Drivers can be downloaded from here		Donate



- 2, Choose a port and connect the battery to your drone
- 3,Connect USB cable to Flytower PRO FC Board
- 4,Click connect
- 5, Check ESC Information
- 6,Check Flash information
- 7, Check and flash the ESC firmware



Note: You have to flash original name firmware of the target(16.6(A_H_15/L_H_0).Do not try flash

other versions of the firmware, So as not to damage the ESC.

Change the motor steering:

When the direction of the motor is not in the desired direction after soldering. The motor direction can be modified as follows:



345,758 345,25	0 MI,011 MI,012	
		Disconnect
2017-06-03 @ 16:45:12 ESC 4: fla	ashing finished in 11.945 seconds	
	ha anna llana OFF ha fana daine an shine an sh	in the second
Note: Make sure you've taken to Note: Connect power to the ESC	ne propellers OFF before doing anything on tr Cs.	IS TAD.
Common Parameters		ESC 1: L-H-0, 16.65, 16.65_Tones
	Programming by TX	Normal Votor Direction
0.50	 Startup Power 	Reversed PPM Min Throttle
140 C	 Temperature Protection 	Bidirectional Bidirectional Reversed PPM Max Throttle
	Low RPM Power Protection	FLASH FIRMWARE
	Brake on Stop	
Low	 Demag Compensation 	ESC 2: 1-H-0, 16 65, 16 65, Tones
Medium	▼ Motor Timing	Powersed Motor Direction
40	Beep Strength	1148 µs
80	Beacon Strength	PPM Min Throttle
10 minutes	Beacon Delay	PPM Max Throttle
		FLASH FIRMWARE
		ESC 3: L-H-0, 16.65, 16.65_Tones
		Reversed Motor Direction
		1148 μs PPM Min Throttle
		1832 µs
Save Debug Log		Defaults Flash All Write Setup Read Setup
rt utilization: D: 0% U: 0% Pa	cket error: 0	1.0.1

1,Normal:keep the original direction unchanged.

2, Reversed: Modified in the opposite direction .

3, The other options please do not make changes!

4,Write setup .

How to use the VTX of Flytower PRO

1, Set the channel

In standby mode, press and hold the key for 3 seconds, the blue LED flashes, short press, change the channel value, add 1 on the current basis, followed by 1-8 cycles.

2, Set the Band

In the channel setting mode, press and hold the key for 3 seconds, the green LED flashes, briefly presses, changes the frequency group value, increments by 1 on the current basis, and then the A-F loop.



In the band setting mode, press and hold the key for 3 seconds, the red LED flashes, short press, change the output power value, increase 1 on the current basis, followed by 25mW / 200mW / 400mW cycle.

	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
Band A	5865	5845	5825	5805	5785	5765	5745	5725
Band B	5733	5752	5771	5790	5809	5828	5847	5866
Band E	5705	5685	5665	5645	5885	5905	5925	5945
Band F	5740	5760	5780	5800	5820	5840	5860	5880
Band H	5362	5400	5436	5473	5510	5547	5584	5620
Band R	5658	5695	5732	5769	5806	5843	5880	5917

4, VTX LED display

BLUE: Frequency channel display, the number of flash represents 1-8 channels, 1 = CH1, 2 = CH2, ..., 8 = CH8. GREE: Frequency Band display, the number of flashes represents the frequency group from A-R, $1 = A, 2 = B \cdots 6 =$

R

RED: Power output display, 1 = 25mW, 2 = 200mW, 3 = 400mW.

5, How to turn VTX on and off

In the working state, quickly double-click the set button, RED / GREEN / BLUE sync flash, VTX can be turned off, and also quickly double-click of the key to open the VTX output.

