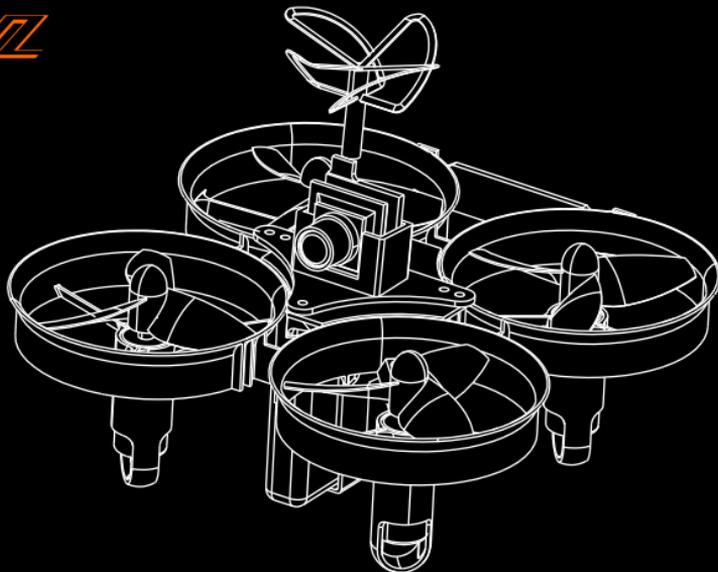


 MACHINE  
TURBINE  
*QX 700*



MICRO FPV RACING DRONES

**Specification**

Brand Name: Eachine

Wheelbase: 73mm

Fly Weight: 54g (with battery)

Size: 98\*98\*75mm

Flight controller: SP RACING F3\_EVO\_Brushed

Firmware version: Cleanflight 1.13.0

Coreless motor: 8520CW/CCW

Propeller: 40mm 4-Blade CW/CCW

Receiver option:

Version1: Frsky compatible SBus receiver

Version2: Flysky compatible PPM receiver

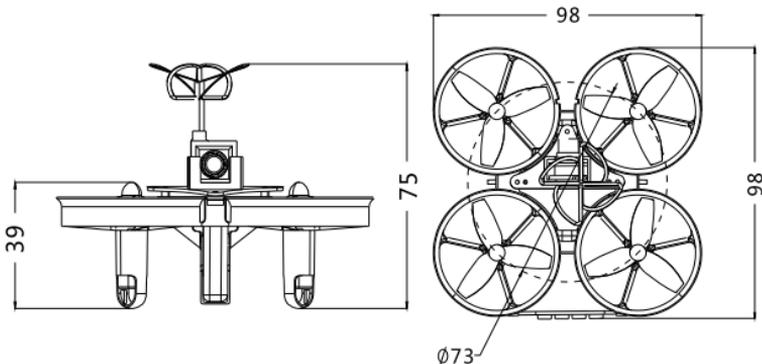
Version3: DSM2/DSMX Compatible Satellite receiver

Camera: 520TVL HD CMOS 1/4 inch Camera

AV Wireless Transmitter: 5.8g 25mw 48ch

Battery: 3.7V 600mah Li-po

Video format : PAL/NTSC



Components	QTY	FRSKY	FLYSKY	DSM2/DSMX	Part NO.
QX70 Aircraft frame	1	Include	Include	Include	QX701
8520 coreless Motor	4	Include	Include	Include	QX95CW/CCW
F3_EVO_BRUSHED Built-in Frsky receiver	1	Include			QX702
F3_EVO_BRUSHED Built-in Flysky receiver	1		Include		QX702
F3_EVO_BRUSHED Built-in DSM2/DSMX receiver	1			Include	QX702
5.8G 48CH 25MW VTX with 520TVL Camera	1	Include	Include	Include	QX70V
Camera mount	1	Include	Include	Include	QX703
Propellers(2pcs cw+2pcs ccw)	2	Include	Include	Include	FB90P
3.7V 600mah Lipo battery	1	Include	Include	Include	QX912
USB Charger	1	Include	Include	Include	QX95C
Propeller Disassembly tool	1	Include	Include	Include	FB907
USB cable	1	Include	Include	Include	QX70C
LED Rear light	1	Include	Include	Include	QX95L

**CAUTION:** Read and follow all instructions and warnings in the manual prior to setup or use. Failure to operate the product correctly can result in damage to the product, personal property and/or injury. This is a sophisticated hobby product. It must be operated with caution and common-sense and requires some basic mechanical ability.

## 1. General Product Safety Precautions

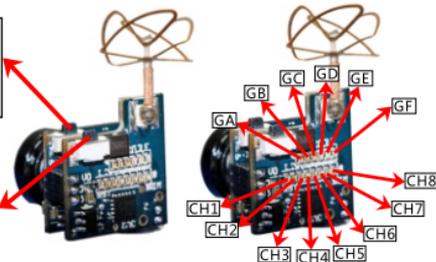
- As the user of this product, you are responsible for operating it safely, not endangering yourself and others, or damaging the product or the property of others.
- Operate your product in open spaces away from people and property.
- Never operate your product with damaged electrical components.
- Keep the transmitter powered on while model is powered on.
- Let parts cool after use before touching, motors will get hot in use.
- Remove batteries after use, as applicable.
- Keep all batteries, chemicals, small parts and anything electrical out of the reach of children.
- Avoid water exposure to this product. Keep parts dry.
- Keep moving parts clean.

## 2. 5.8G VTX channels list

FR \ CH		FR					
		GA	GB	GC	GD	GE	GF
CH	CH1	5740MHz	5705MHz	5865MHz	5658MHz	5733MHz	5362MHz
	CH2	5760MHz	5685MHz	5845MHz	5695MHz	5752MHz	5399MHz
	CH3	5780MHz	5665MHz	5825MHz	5732MHz	5771MHz	5436MHz
	CH4	5800MHz	5645MHz	5805MHz	5769MHz	5790MHz	5473MHz
	CH5	5820MHz	5885MHz	5785MHz	5806MHz	5809MHz	5510MHz
	CH6	5840MHz	5905MHz	5765MHz	5843MHz	5828MHz	5547MHz
	CH7	5860MHz	5925MHz	5745MHz	5880MHz	5847MHz	5584MHz
	CH8	5880MHz	5945MHz	5725MHz	5917MHz	5866MHz	5621MHz

NTSC/PAL Switch still touch up 2S; Short touch switch to reverse video display

Frequency group A~F selected still touch up to 2S; Channel ch1~ch8 selected with short touch.



### 3. Charge the Flight Battery

⚠ NOTICE: Inspect the battery to make sure it is not damaged e.g., swollen, bent, broken or punctured. Charge only batteries that are cool to the touch and are not damaged.

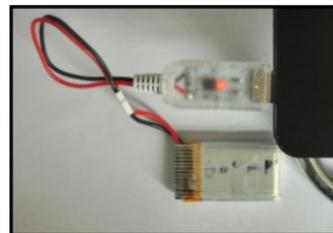
#### Charging with USB Li-Po Charger

Connect the battery to the USB Li-Po Charger, then plug into the USB port of your computer

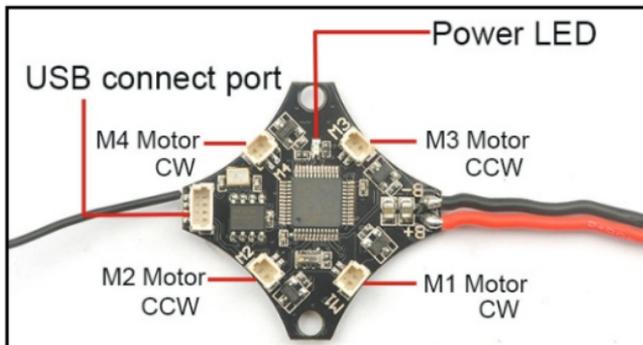
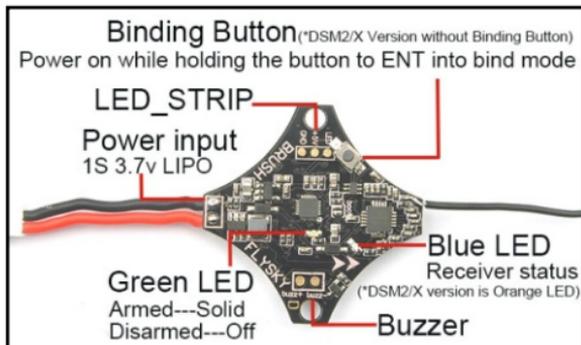
#### LED STATUS:

Solid Red LED --Charging

Solid Blue LED --Charge Complete

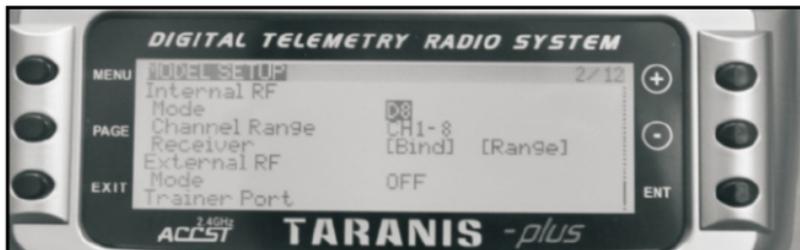


### 4. Flight controller connection diagram

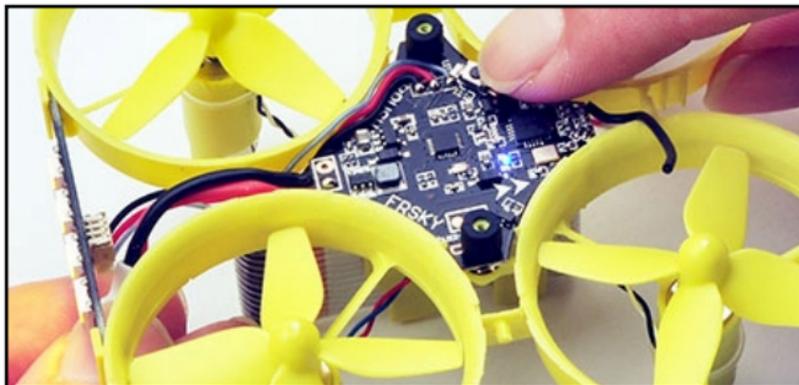


## 5.(Frsky version)Binding Procedure

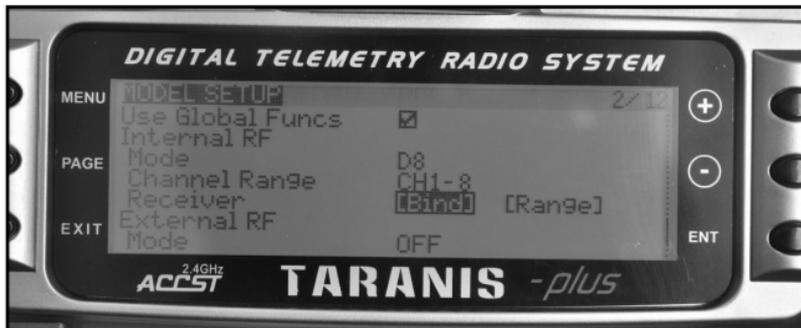
1.Turn on the transmitter , select D8 mode for the Receiver.



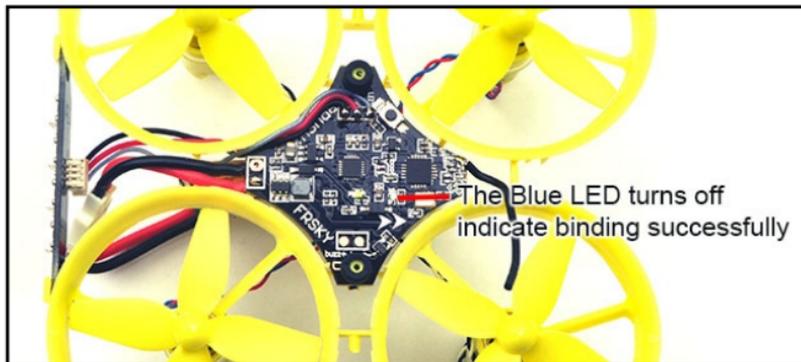
2.Connect the battery to the Turbine QX700 while holding the binding button, the Blue LED will get be solid, this indicates the receiver get into the binding mode.



3. Move to the Receiver [Bind] option in the transmitter and ENT to Bind with the receiver, The transmitter beeps.



4. The Blue LED on the board will turning off, this indicates that the bind process was successful. Reconnect the battery for the flight controller, and the Blue LED on the receiver is solid again. It means connection is established with your transmitter



5. We have configured the Frsky receiver before shipping. If you flashed the firmware, Please setup as the following steps: Enable Serial\_RX for UART2 and Set Receiver mode RX\_SERIAL, Select SBUS in Cleanflight or Betaflight Configurator.

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**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.

Interface	Mode	Logging	Telemetry	RC	GPS
USB VCP	<input checked="" type="checkbox"/> MSP (115200)	<input type="checkbox"/> Blackbox (115200)	Disabled / AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600
UART1	<input checked="" type="checkbox"/> MSP (115200)	<input type="checkbox"/> Blackbox (115200)	Disabled / AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600
UART2	<input type="checkbox"/> MSP (115200)	<input type="checkbox"/> Blackbox (115200)	Disabled / AUTO	<input checked="" type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600
UART3	<input type="checkbox"/> MSP (115200)	<input type="checkbox"/> Blackbox (115200)	Disabled / AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600

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**Receiver Mode**

- RX\_PPM PPM RX input
- RX\_SERIAL Serial-based receiver (SPEKSAT, SBUS, SUMD)
- RX\_PARALLEL\_PWM PWM RX input (one wire per channel)
- RX\_MSP MSP RX input (control via MSP port)

---

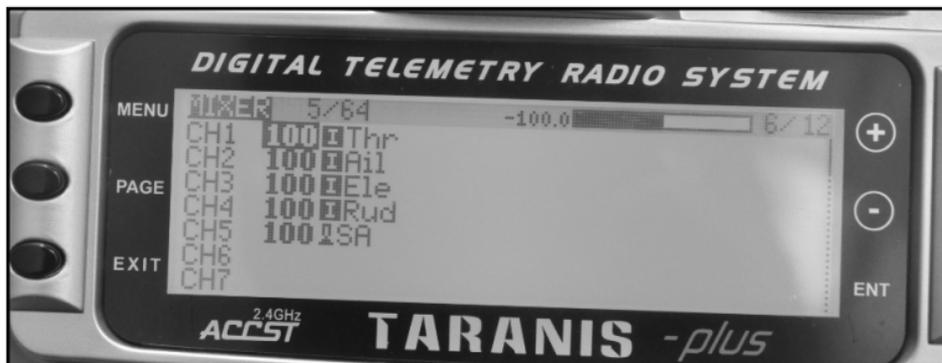
**Serial Receiver Provider**

Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

- SPEKTRUM1024
- SPEKTRUM2048
- SBUS**
- SUMD
- SUMH
- XBUS\_MODE\_B
- XBUS\_MODE\_B\_RJ01
- IBUS

## 6.(Frsky version)Set the switch to ARM/DISARM the motor

1.Turn on the transmitter and move to the MIXER interface, Set "SA" or "SB" switch etc. for Ch5 to ARM/DISARM the motor.



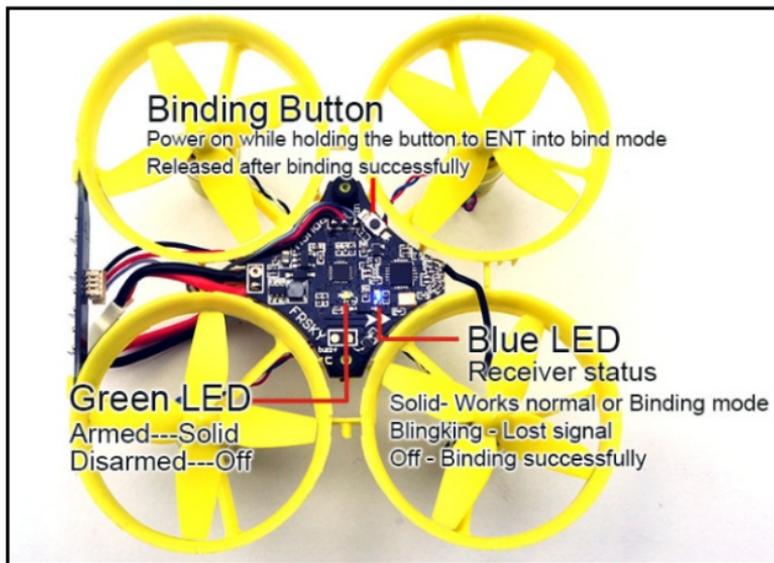
2.The QX70 Frsky Version BNF was set AUX1(CH5) to ARM/DISARM the motor before shipping, you can also customize it.



3.The default receiver channel map for frsky version is TAER1234, please ensure your transmitter is matched with it, otherwise it can't be armed.

Channel Map	RSSI Channel
TAER1234	Disabled

4.Toggle the Switch and the green LED on the flight controller will get be solid, this indicate the motor was armed ,enjoy yourself now !



## 7.(Flysky Version)Binding procedure

1.Turn on your radio and Set receiver mode to AFHDS, then get your radio into binding mode(Take FLYSKY I6 as an example)

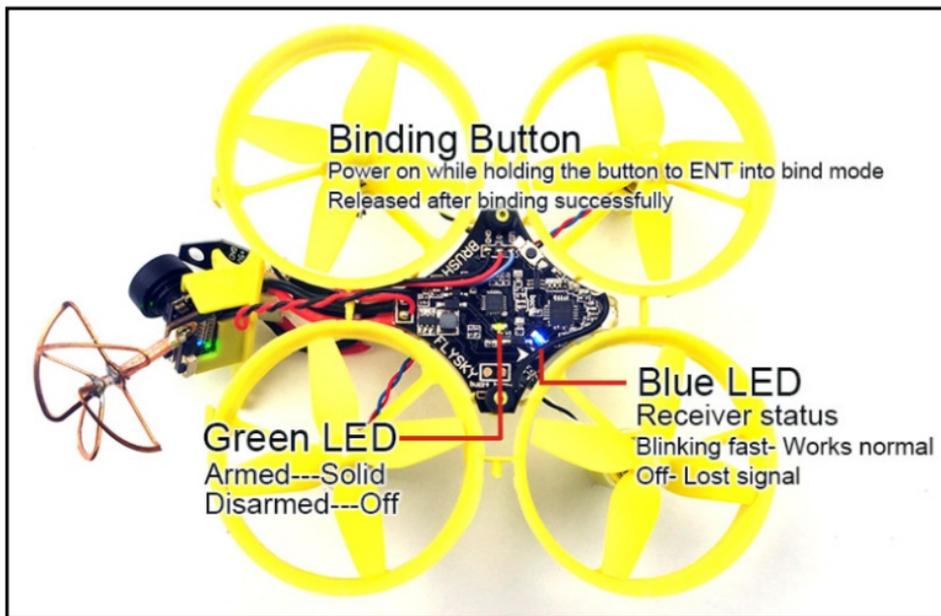


1.Select RX setup to AFHDS Mode



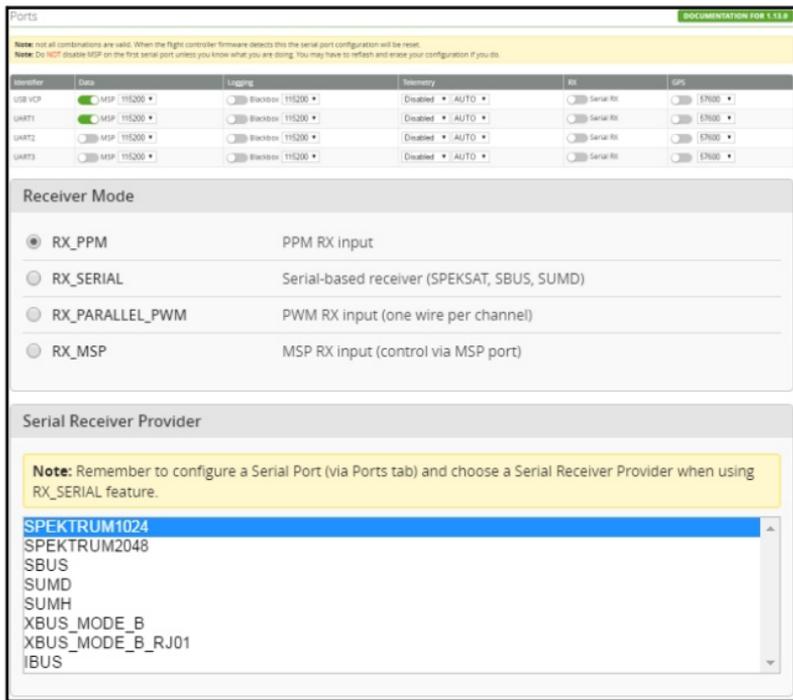
2.Turn on the transmitter while holding the bind button

2.Connect the battery to the QX70 while holding the Binding button on the board ,the Blue LED will getting to be solid first and turn off for a second ,then it will getting to be solid again , this indicates binding successfully.



3.Re-power for the QX70, the Blue LED will blinking fast, this indicate the connection was established between the receiver and the transmitter, it works normal.

4. We have configured the Flysky receiver before shipping. If you flashed the firmware, please set receiver mode to be RX\_PPM in Cleanflight or Betaflight Configurator



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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.

Identifier	Data	Logging	Telemetry	RS	GPS
USB VCP	<input checked="" type="checkbox"/> MSP 115200	<input type="checkbox"/> Blackbox 115200	Disabled   AUTO	<input type="checkbox"/> Serial RS	<input type="checkbox"/> E9600
UART1	<input checked="" type="checkbox"/> MSP 115200	<input type="checkbox"/> Blackbox 115200	Disabled   AUTO	<input type="checkbox"/> Serial RS	<input type="checkbox"/> E9600
UART2	<input type="checkbox"/> MSP 115200	<input type="checkbox"/> Blackbox 115200	Disabled   AUTO	<input type="checkbox"/> Serial RS	<input type="checkbox"/> E9600
UART3	<input type="checkbox"/> MSP 115200	<input type="checkbox"/> Blackbox 115200	Disabled   AUTO	<input type="checkbox"/> Serial RS	<input type="checkbox"/> E9600

### Receiver Mode

- RX\_PPM PPM RX input
- RX\_SERIAL Serial-based receiver (SPEKSAT, SBUS, SUMD)
- RX\_PARALLEL\_PWM PWM RX input (one wire per channel)
- RX\_MSP MSP RX input (control via MSP port)

### Serial Receiver Provider

Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

- SPEKTRUM1024**
- SPEKTRUM2048
- SBUS
- SUMD
- SUMH
- XBUS\_MODE\_B
- XBUS\_MODE\_B\_RJ01
- IBUS

**8.(Flysky Version)Set the switch to ARM/DISARM the motor**

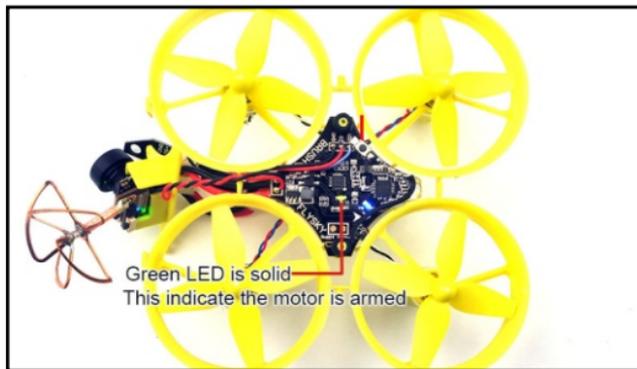
1.Turn on the transmitter and move to the AUX. Channels interface, Set "SWA" or "SWB" switch etc. for CH5 to ARM/DISARM the motor, Take FLYSKY I6 as an example.



2.The Turbine QX70 was set AUX1(CH5) to ARM/DISARM the motor before shipping ,and you can also customize it with Cleanflight or Betaflight Configurator. The default receiver Channel map for Flysky Version is AETR1234, please ensure your transmitter is matched with it, otherwise it can't be armed.



3.Turn on the transmitter and then power on for the QX70, Toggle the switch and the green LED on the flight controller will get be solid, this indicate the motor was armed, enjoy the flight now but be careful !



## 9.(DSM2/DSMX Version)Binding procedure and Satellite setup

- The Turbine QX70 DSM2/DSMX Version is integrate a DSM2/DSMX compatible Satellite receiver. The binding procedure is like following:
  - Connect flight controller to computer and open Cleanflight or Betaflight configurator, From CLI tab type: "set spektrum\_sat\_bind = 9" for DSMX or "set spektrum\_sat\_bind = 5" for DSM2.
  - Type "save" and after Flight controller reboot remove USB cable (=Power off the board).
  - Wait a sec and reconnect the USB cable. After cold start satellite led(Orange color LED) should start blinking and transmitter should be turned on while pressing the bind button(DX9 is get into the system setup and select bind option).
  - After binding satellite the orange led should be solid. Connect Cleanflight or Betaflight and use receiver tab to test that satellite is working correctly.
  - Final step is to go to CLI tab and type "set spektrum\_sat\_bind = 0" and then type "save". This must be done so that satellite doesn't go back to binding mode when the flight controller is repowered again.



Entering CLI Mode, type 'exit' to return, or 'help'

```
# Set spektrum_sat_bind=9
spektrum_sat_bind set to 9
# save
```

**For DSMX**

Entering CLI Mode, type 'exit' to return, or 'help'

```
# Set spektrum_sat_bind=5
spektrum_sat_bind set to 5
# save
```

**For DSM2**

Entering CLI Mode, type 'exit' to return, or 'help'

```
# Set spektrum_sat_bind=0
spektrum_sat_bind set to 0
# save
```

**Close Binding**

\*Cautions The orange LED is blinking slowly after binding successfully with some DSM2 Radio

2.The Turbine QX70 was set AUX1(CH5) to ARM/DISARM the motor before shipping ,and you can also customize it with Cleanflight or Betaflight Configurator. The default receiver Channel map for DSM2/DSMX Version is TAER1234, please ensure your transmitter is matched with it, otherwise it can' t be armed.



3.Turn on the transmitter and set a switch for CH5 to ARM/DISARM the motor, some transmitter like SPECKTRUM DX6/DX6I, the default CH5 is GEAR Switch.

4.Turn on the transmitter and then power on for the QX70, Toggle the switch and the green LED on the flight controller will get be solid, this indicate the motor was armed, enjoy the flight now but be careful !

5. We have configured the satellite receiver before shipping. If you flashed the firmware, please setup as the following steps: Enable Serial\_RX for UART3 and Set Receiver mode RX\_SERIAL, Select SPEKTRUM1024 for DSM2 Radio and Select SPEKTRUM2048 for DSMX Radio in Cleanflight or Betaflight Configurator.

Ports
[CONNECTIONS FOR 3.12.8]

**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.

Identifier	Driver	baud	parity	stopbits	flow control	rx	tx
USB_VCP	<input checked="" type="checkbox"/> MSP   115200	<input type="checkbox"/> Backdoor   115200	Disabled	AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600	<input type="checkbox"/> 57600
UART1	<input checked="" type="checkbox"/> MSP   115200	<input type="checkbox"/> Backdoor   115200	Disabled	AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600	<input type="checkbox"/> 57600
UART2	<input type="checkbox"/> MSP   115200	<input type="checkbox"/> Backdoor   115200	Disabled	AUTO	<input type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600	<input type="checkbox"/> 57600
UART3	<input type="checkbox"/> MSP   115200	<input type="checkbox"/> Backdoor   115200	Disabled	AUTO	<input checked="" type="checkbox"/> Serial Rx	<input type="checkbox"/> 57600	<input type="checkbox"/> 57600

### Receiver Mode

- RX\_PPM      PPM RX input
- RX\_SERIAL      Serial-based receiver (SPEKSAT, SBUS, SUMD)
- RX\_PARALLEL\_PWM      PWM RX input (one wire per channel)
- RX\_MSP      MSP RX input (control via MSP port)

### Serial Receiver Provider

**Note:** Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

- SPEKTRUM1024
- SPEKTRUM2048
- SBUS
- SUMD
- SUMH
- XBUS\_MODE\_B
- XBUS\_MODE\_B\_RJ01
- IBUS

⚠ If you flashed the firmware or erase chip, please first do the following procedure, don't connect the battery otherwise the motor will auto-spin

1. Cleanflight: Go to the CLI tab, type "Set motor\_pwm\_rate=1000", then enter save

```
Entering CLI Mode, type 'exit' to return, or 'help'  
  
# set motor_pwm_rate=1000  
motor_pwm_rate set to 1000  
# save
```

2. Betaflight: Go to Configure Tab and set ESC/Motor protocol to BRUSHED

### ESC/Motor Features

BRUSHED ▾ ESC/Motor protocol

Motor PWM speed Separated from PID speed

MOTOR\_STOP Don't spin the motors when armed

Disarm motors regardless of throttle value (When arming via AUX channel)

\*This step is in order to avoid motor auto-spinning when connect the battery

## 10.LED Strip function

The flight controller of QX70 can control colors and effects of individual LEDs on a strip. The default setup is like this, you can also customize by yourself effects.

LED Strip

The flight controller can control colors and effects of individual LEDs on a strip. Configure LEDs on the grid, configure wiring order then attach LEDs on your aircraft according to grid positions.

Clear selected Clear ALL 28  
Remaining

LED Functions

Warnings	Modes & Orientation
Indicator	Arm State
Throttle	Ring
Color	GPS
RSSI	Blink

LED Orientation and Color

N	0	1	2	3
W	4	5	6	7
E	8	9	10	11
S	12	13	14	15
U				
D				

## 11.LED Strip status

	Disarm
	Armed
 4 LEDs Blinking Fast	Brake
 Throttle	Throttle
 2 LEDs Blinking Fast	Roll left
 2 LEDs Blinking Fast	Roll right



[www.eachine.com](http://www.eachine.com)

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\*User manual is subject to change without prior notice.