TYRD99

QUICK START GUIDE (DIY)





Package included: 1 x 210mm frame kit 2 x 2206 2150KV brushless motor CW 2 x 2206 2150KV brushless motor CCW 1 x 4 IN 1 30A BLHeli_S ESC 1 x Customized F4 flight controller 1 x 700TVL COMS camera 1 x 5.8G 40CH 0mw/25mw/200mw/600mw switchable VTX 1 x Pagoda Antenna 2 x Battery strap 10 x Racerstar 5038 2 blade propeller CW

10 x Racerstar 5038 2 blade propeller CCW





1.0 Frame kit

Wheel base: 210mm Frame arm thickness: 5mm Bottom plate thickness: 2mm Side plate thickness: 2mm Frame kit material: 3K carbon fiber & 6065 aluminium



2.0 Motor

Motor KV: 2150RPM/V Idle current (Io/10V): 1.26A Lipo cell: 3-5S Weight: 31g Max continuous current: 31A Max continuous power: 496W Max thrust: 1050g (4S/5") Configu-ration: 12N/14P Motor resistance (RM): 0.0572 Ω

Stator diameter: 22mm Stator thickness: 6mm Motor diameter: 27.7mm Motor body length: 19.2mm Overall shaft length: 34.2mm Prop adapter shaft: M5 Bolt holes spacing: 16mm Bolt thread: M3 Propeller: 5-6 inch







3.0 ESC

Continuous current: 30A Peak Current: 40A(10S) Input voltage: 2-5S BEC: 5V 2A BEC Main control chip: 48Mhz EFM8BB2 Firmware: BLHeli_S supports Dshot600 MOS: 5*6

Product characteristics:

The high performance EFM8BB21F16G microprocessor is used to run up to 48MHz. The high quality 5 * 6 package MOSFET is more reliable than the 3 * 3 package MOSFET.6 layers of high TG 3OZ copper thick PCB sheet, greatly reduce heating and efficiency. Using the BLHeli_S open source program, you can upgrade the firmware or change the tuning parameters through the throttle signal line to support the BLHeli_S complete The function of the Department; It can support DShot150/300/600 digital throttle mode and common PWM, OneShot125, OneShot42. MultShot throttle mode; The built-in 5V@2A BEC can provide power for flight control, camera, picture transmission, LED lamp and other devices.

Interface definition chart:

BAT: power positive electrode; GND: power negative electrode; 5V:5V regulated power supply output interface, maximum current 2A; S1-4: throttle signal input interface, S1 corresponds to M1.S2 corresponds to M2, S3 corresponds to M3, S4 corresponds to M4.Number electric adjustment;

POWER INPUT: power line pads, "GND" corresponding power supply. The line negative pole, "BAT" corresponds to the positive pole of the power supply line.



4.0 Flight controller

Product characteristics:

The STM32 F405 master chip can run higher PID cycle time and gyroscope. Integrating accelerometers and gyroscopes using an ICM20602 chip with SPI bus (the highest operating frequency of the gyroscope can be set to32KHz);Flight control board OSD chip, supporting DMA mode (using F4 MCU to control OSD), can use Beta Flight tuning softwarePart adjustment parameters; Supporting BetaFlight firmware, you can use BetaFlight tuning software to easily adjust various parameters, more suitable for FPV flyingRow and competition; Support various types of receivers (such as: SBUS, SUMH, SUMD, SPEKTRUM1024/2048, XBUS, PPM, etc.)Type of receiver; With LED programmable signal output port, support programmable LED lamp strip, can adjust lamp strip color and flash mode through flight control; Has a voltage monitoring port (BAT) and a current monitoring port (CRT) to monitor battery voltage and current (requiring additional electricity) Flow meter): It has a buzzer output port and supports an external alarm buzzer for voice warning or flight status notification. It has Micro USB interface to facilitate users to connect computers.

Interface definition chart:





5.0 Camera

Case size: 25mm*25mm Weight: 9.5g Total pixels: PAL: 1020H×596V (0.61MP); NTSC: 1020H×508V (0.52MP) Effective pixels: PAL: 976H×582V (0.57MP); NTSC: 976H×494V (0.48MP) Signal system: PAL/NTSC switchable Resolution ratio(horizontal center): 700TVL Video output: 1.0Vp-p/75Ω Automatic gain control: 0.25/0.50/0.75/1.00, up to 55dB White balance: on/off optional Exposure mode: electron exposure Electronic shutter: 1/50(1/60) - 1/100000 S Gamma correction: 0.45/1.0 Synchronization method: inter-sync Camera lens: standard 2.8mm Lens operating voltage: DC12V (wide voltage, measured can work normally at 7.5-13V) Working current: 70mA (low power consumption) Working temperature: -20*C-60*C Humidity: 0%~98%

6.0 Switchable VTX

Output power & transmission distance: $\geq 0.5 \text{km} \otimes 25 \text{mW}$, $\geq 1 \text{km} \otimes 200 \text{mW}$, $\geq 2 \text{km} \otimes 600 \text{mW}$ Transmitting power: 0mW/25mW/200mW/600mW Full video format: NTSC /PAL Input voltage & power dissipation: 7V~24V, +12V/260mA@600mW Size: 20*30*9mm Weight: $\leq 7g(\text{except antenna})$ With output power self-check function. Nixie tube SCAN: frequency point (1-8), frequency band (A-E), power (1-3, 0=0mw, 1=25mw, 2=200mw, 3=600mw)





6.0 Switchable VTX

Frequency control method:

Button frequency control (1-8): press the button for 2 seconds to enter the frequency setting, and press the button to change the frequency CH1-8. Change the frequency band (A-E), set the frequency, press the button for 2 seconds, then press the button to change the frequency group FR (A-E).

| Band | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------|------|------|------|------|------|------|------|------|
| A | 5865 | 5845 | 5825 | 5805 | 5785 | 5765 | 5745 | 5725 |
| ь | 5733 | 5752 | 5771 | 5790 | 5809 | 5828 | 5847 | 5866 |
| С | 5705 | 5685 | 5665 | 5665 | 5885 | 5905 | 5905 | 5905 |
| d | 5740 | 5760 | 5780 | 5800 | 5820 | 5840 | 5860 | 5880 |
| E | 5658 | 5695 | 5732 | 5769 | 5806 | 5843 | 5880 | 5917 |

Points for attention:

The antenna is installed at the output terminal before power up, so as not to damage internal components.Note that the input voltage is within the specified range and is positive or negative, so as not to damage internal components.If the antenna is replaced, choose a standing wave and a good gain antenna to obtain a longer transmission distance.Attention should be paid to electrostatic protection during transportation and installation.

7.0 Pagoda Antenna

Gain: 5dBi Max. Power: 50w Connector: RP-SMA Color: Black Weight: 8.6g Length: 78±3mm Max. Dia.: 22.4±1mm Min. Dia.: 11.8±1mm Frequency: 5.8G Impedance: 50Ω VSWR: <1.5:1 Polarization: Circular Polarized Radiation: Omni

Features : Omni-directional, no dead corner High gain, more stable. Less flash, stonger siginal



8.0 Propeller

Material: PC Mounting hole: 5mm Center thickness: 8mm Quantity: 10 pairs Color: blue, red, yellow, purple, white Weight: 7.25G a pair Delivery color randomly (10 pairs of propellers are the same color)



9.0 Screws



10.Exploded view



11.Adjusting parameter

1.Click connect connection



2: Click the RX interface under UART2 under the ports option, as shown in the figure.

| - Ports | Ports | | | | | WIKI |
|-------------------|------------------|----------------------------------|-----------------------|---|--|-------------------|
| Configuration | Note: not all co | mbinations are valid. When the f | light controller firm | ware detects this the serial port configu | ration will be reset. | |
| D Power & Battery | Note: Do Nor C | asaure way on the first senal po | rt uniess you know | what you are oping, rou may have to re- | iash and erase your conliguration il you do. | |
| # PID Tuning | Identifier | Configuration/MSP | Serial Rx | Telemetry Output | Sensor Input | Peripherals |
| de Receiver | USB VCP | 115200 • | | Disabled • AUTO • | Disabled • AUTO • | Disabled • AUTO • |
| 2 Modes | UART1 | 115200 • | .2 | Disabled • AUTO • | Disabled • AUTO • | Disabled • AUTO • |
| 🛔 Mators | UART2 | 115200 • | * | Disabled • AUTO • | Disabled • AUTO • | Disabled • AUTO • |
| CSD OSD | UART3 | 115200 • | | Disabled • AUTO • | Disabled • AUTO • | Disabled • AUTO • |

3: Click CONFIGURATIN to change to dshot600.

| JB 1 0103 | | |
|-----------------------------------|---|--|
| Configuration | Note: Not all combinations of features are valid. When the flight control | ler firmware detects invalid feature combinations conflicting features will be disabled. |
| D Power & Battery | Note: Conigore senai ports before enabling die features that will use th | e pors. |
| A PID Tuning | Mixer | ESC/Motor Features 3 |
| d Receiver | Quad X | DSHOT600 ESC/Motor protocol |
| 2 Modes | TA OT | MOTOR_STOP Don't spin the motors when armed |
| A Motors | | Disarm motors regardless of throttle value (When ARM is configured in Modes |
| CSD SD | + | tab via AUX channel) |
| I Blackbox | | 4.5 C Motor idle Throttle Value (percent) |
| 🖾 CLI | | |

4: Click CONFIGURATIN; change to SBUs

| | Serial-based receiver (SPEKSAT, S • Receiver Mode | RSSLADC Analog RSSI input |
|-----------------------------------|--|---|
| Configuration | Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX SERIAL feature. | |
| D Power & Battery | SBUS Serial Receiver Provider | |
| ♣ PID Tuning | | |
| d Receiver | Other Features | 3D ESC/Motor Features |
| 2 Modes | Note: Not all features are supported by all flight controllers. If you enable a specific feature, and it is disabled after you hit 'Save and Reboot', it means that this feature is not | 3D 3D mode (for use with reversible ESCs) |

5: Click modes, add arm and angle, drag the slider between 1300 and 1700, and set arm to AUX1 and angle to aux2

| 击 PID Tuning | ARM AUX 1 . | | • |
|--------------|--|---|----------------|
| de Receiver | Add Range Min: 1300 | | 1800 2000 2100 |
| 😳 Modes | the second secon | 5 | 1000 2000 2100 |
| A Motors | ANGLE AUX 2 * | | |
| CSD SD | Add Range Min: 1300 | · · · · · · · · • · • · • · • · • · • · • · • · • · • · • • · • • · • • · • • · • • · • • • • | 1800 2000 2100 |
| I Blackbox | | | |

11.Adjusting parameter

6: Push the slider to test the positive and negative rotation of the motor, such as error,

| 2 Modes | | | | | Motors | | - | | | | | | | Serv | 05 | | | |
|------------|------|--------|--------|------|--------|------|------|------|--------|-------------------|--------|----------------------------|---------------------------|----------------------|---------------|---------------|--------------|---------|
| A Motors | | in r | ί. | | , | 0 | ŕ | • | | | | - | | - | - | 0 | | 0 |
| CSD SD | 1000 | 1000 1 | 1000 1 | 1000 | 0 | 0 | 0 | 0 | | 15 | m | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
| E Blackbox | | c | | | | | | | | | | | | | | | | |
| | | 0 | | | | | | | | _ | | _ | _ | _ | _ | _ | _ | - |
| | | | | | | | | | | Mot Mov up. | or Tes | t Mode / A e sliders or | rming Noti arming your | ce: craft with th | ne transmitte | er will cause | the motors | to spin |
| | | | | 11 | | | | | | In o | der to | prevent inj | ury remove | ALL propel | lers before | using this fe | ature. | |
| | 1000 | 1000 1 | 1000 1 | 000 | 1000 | 1000 | 1000 | 1000 | Master | | Lund | derstand th | e risks, prop | ellers are ret | moved - Ena | ible motor o | ontrol and a | rming. |

7: Click font manager, select betaflight, click upload font

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|-----------------------------|-------------|------------------|-----------------------------|-----------------------|-------------------|---------------|--------------------|-------|
| J → Setup | OSD | USD Pont Manager | | | | ^ | | THE I |
| jier Ports | 030 | Font presets: | efault Bold Large | Extra Large Betafight | Digital Clarity O | pen Font File | | |
| Configuration | Note: OSD | | | | | | | |
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| A PID Tuning | Elements | 58 () |)∲ ^{™°°°°°°°°} ,∎ | | (67 · BEIGD 2 | ANGLO | | |
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| | CIB Thrott | | | | 1 Kin | 2 Source: T | TOTAL ARMED TIME * | |
| | | | | | | | Font Manager | Save |

8: Click setup, calibrate accelerometer

| 2018-08-30 @ 17:42:42 Cratt 2018-08-30 @ 17:42:42 Arml | ng Disabled | | | |
|---|-------------------------|---|----------------------|------|
| ➢ Setup | Setup | | | |
| 🕼 Ports | Setup | 8 | | WIN |
| | Calibrate Accelerometer | Place board or frame on leveled surface, proceed with calibration, ensure platform is not moving during calib | oration period | |
| | Calibrate Magnetometer | Move multirotor at least 360 degrees on all axis of rotation, you have 30 seconds to perform this task | | |
| | Reset Settings | Restore settings to default | | |
| | Backup Restore | Backup your configuration in case of an accident, CLI settings are not included - See 'dump' cli command | | |
| | | | | |
| | Heading: 6 deg | Reset Z axis, offset: 0 deg | Info | |
| = OSD | Roll: 0 deg | | Arming Disable Hags: | 2,16 |