FLIPSKY FT85RS ESC

FLIPSKY FT85RS ESC User Manual

Model: **FT85RS ESC** | Brand: **FLIPSKY**

1. Introduction

This manual provides comprehensive instructions for the FLIPSKY FT85RS ESC (Electronic Speed Controller) with Aluminum Case Water Cooling Enclosure. This high-performance ESC is designed for demanding applications such as E-Foils, fighting robots, surfboards, and AGV robots, offering robust power delivery and advanced control capabilities. Please read this manual thoroughly before installation and operation to ensure safe and optimal performance.

2. What's in the Box

Upon opening the package, verify that all components listed below are present and in good condition:

- FT85RS ESC With Aluminum Case Water Cooling Enclosure NON-VESC
- Various connection cables (USB, Hall sensor, PPM, ADC, CAN, Power switch)

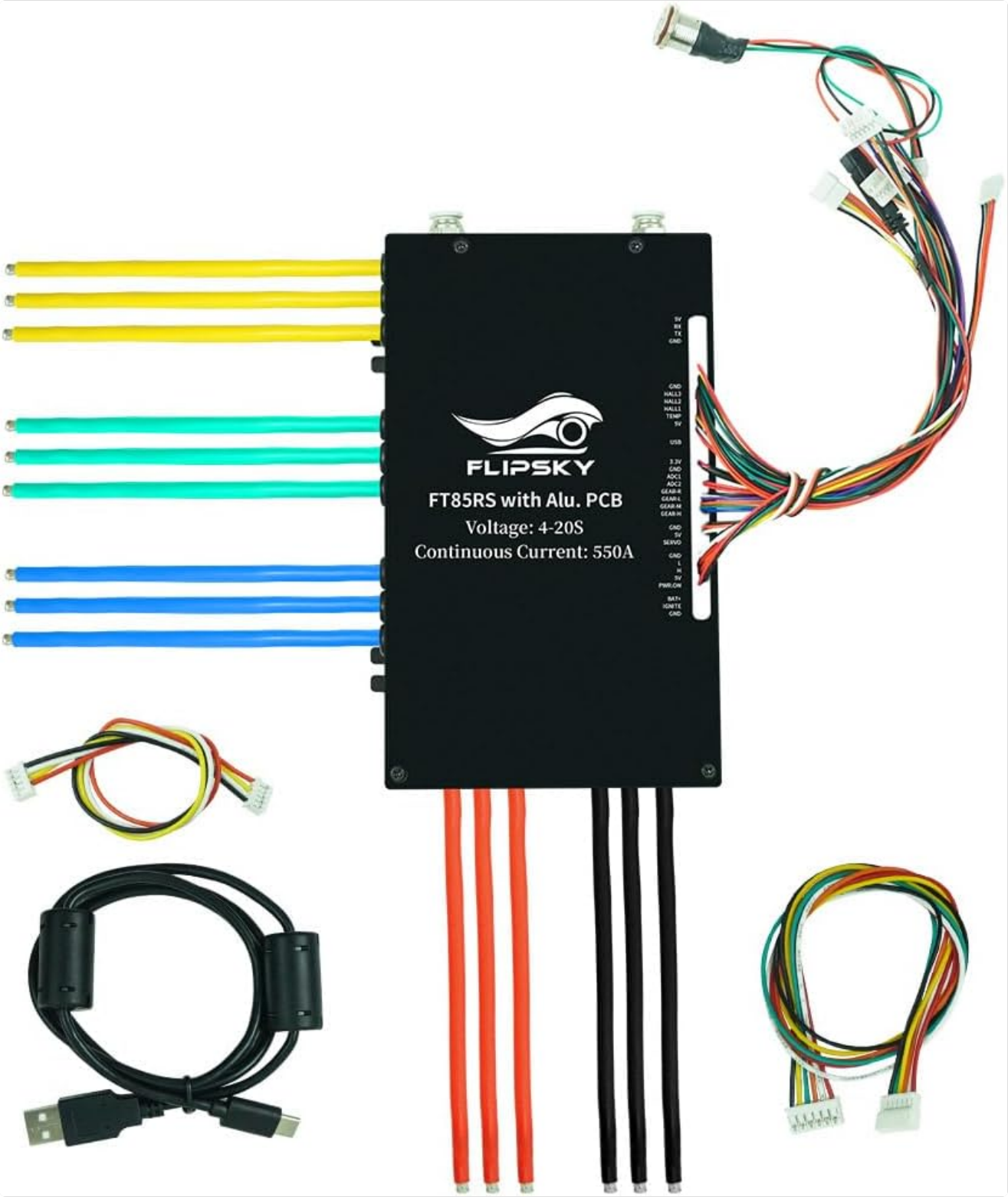

Image 2.1: Contents of the FLIPSKY FT85RS ESC package, showing the main ESC unit, various connection cables, and a USB cable.

3. Specifications

The FLIPSKY FT85RS ESC boasts the following technical specifications:

Parameter	Value
Firmware	V1.3 or above (update via Flipsky ESC Tool)
Voltage Range	14V-84V (4S-20S safe)

Parameter	Value
Continuous Current (50V)	550A
Continuous Current (75V)	450A
Peak Current	1000A
BEC Output	5V@1A
Motor/Power Wire Size	8 AWG (3pcs combine)
Programmable Tool	Flipsky ESC TOOL
Communication Ports	USB, CAN, UART, PPM, ADC
Input Signal Support	PPM, ADC, UART (compatible with FLIPSKY remote VX4 and VX3Pro)
Startup Modes	IPDS (sensorless), HFPI (sensorless), HALL (sensored)
Dimensions (L*W*H)	227.5mm * 140mm * 54mm (with water cooling enclosure)
Product Dimensions (inches)	8.96 x 5.51 x 2.13 inches

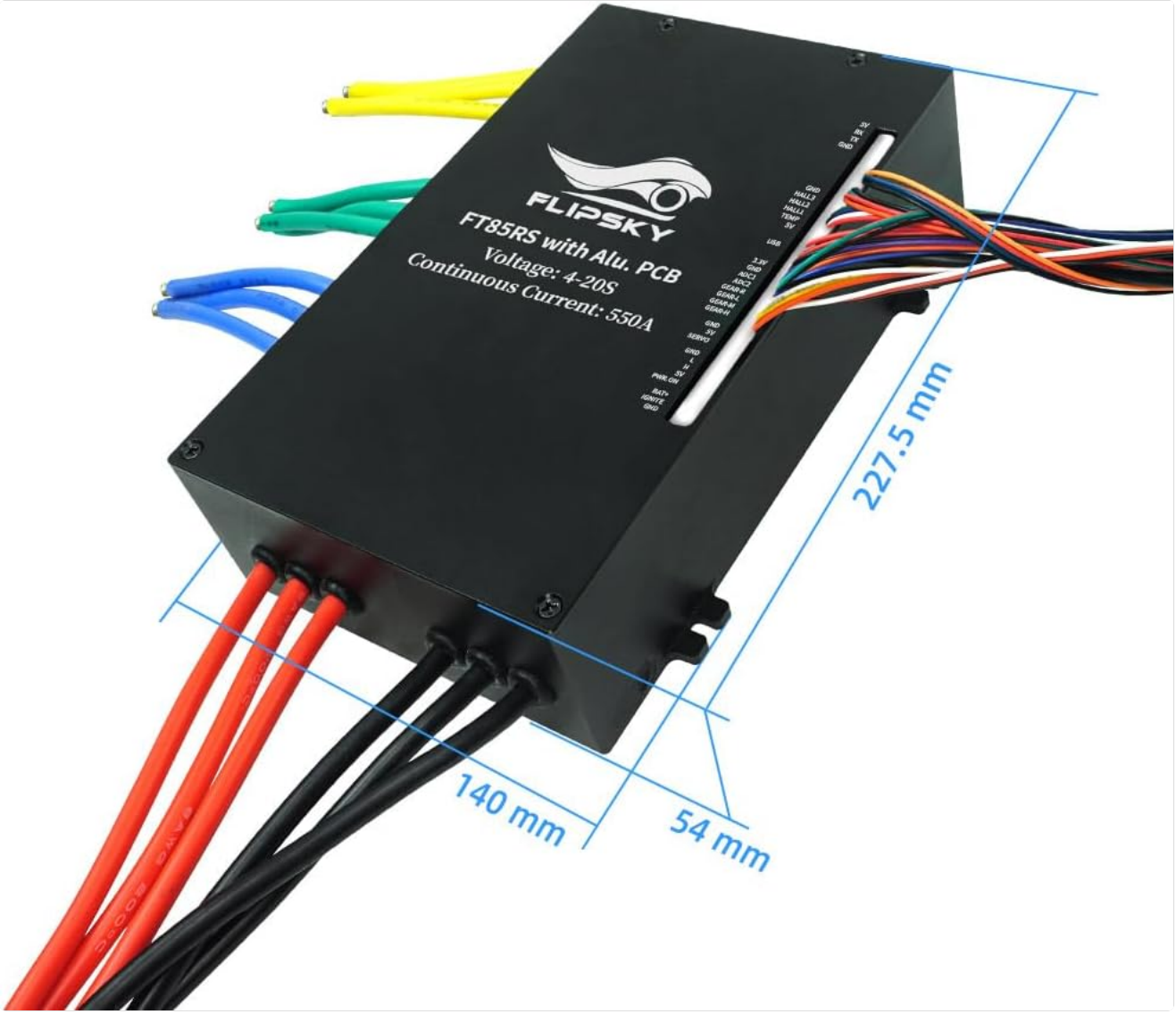

Image 3.1: Physical dimensions of the FLIPSKY FT85RS ESC, indicating its length, width, and height.

4. Features

Key features of the FLIPSKY FT85RS ESC include:

- Equipped with CPU AT32F403ARCT7 (ARM Cortex-M4 structure), enabling 240MHz CPU clock speed and max PWM switching frequency of 45KHz for improved motor RPM.
- Programmable via Flipsky ESC Tool for compatibility with various motor types, battery voltages, and control methods.
- Also programmable via Flipsky VX4 remote (Firmware Version: VX4_V1.2.1 or above).
- Supports FOC (Field-Oriented Control) for low working noise and smooth motor starting.
- Provides real-time data monitoring and fault alerts.
- Features adaptive variable PWM frequency control.
- Supports both sensored (HALL) and sensorless (IPDS, HFPI) modes.
- Supports Current and Duty Cycle control types.
- Includes multiple speed gear levels: Low, Medium, High, Reverse.
- Supports power on/off button switch or key switch.
- Integrated protection functions: low and high voltage protection, motor over-temperature protection (for NTC-10K-25℃ temperature sensing resistance only), battery over-discharge protection, MOSFETs over-current and over-temperature protection.

5. Safety Information

Adherence to safety guidelines is crucial for preventing damage to the ESC and ensuring user safety. Always observe the following:

- Ensure the firmware is V1.3 or above. Firmware updates can be performed via the Flipsky ESC Tool.
- Always disconnect power before making any connections or disconnections.
- Verify correct polarity for battery connections (BAT+ to positive, BAT- to negative). Incorrect polarity will cause severe damage.
- Operate the ESC within its specified voltage and current limits to prevent overheating and component failure.
- Ensure adequate cooling, especially when operating at high currents. The water cooling enclosure requires proper water circulation.
- Avoid short circuits on any terminals.
- Keep the ESC away from moisture, dust, and extreme temperatures.
- If any unusual behavior or smoke is observed, immediately disconnect power.

6. Setup and Installation

Proper connection of the FT85RS ESC is vital for its functionality. Refer to the connection diagram below and follow these steps:

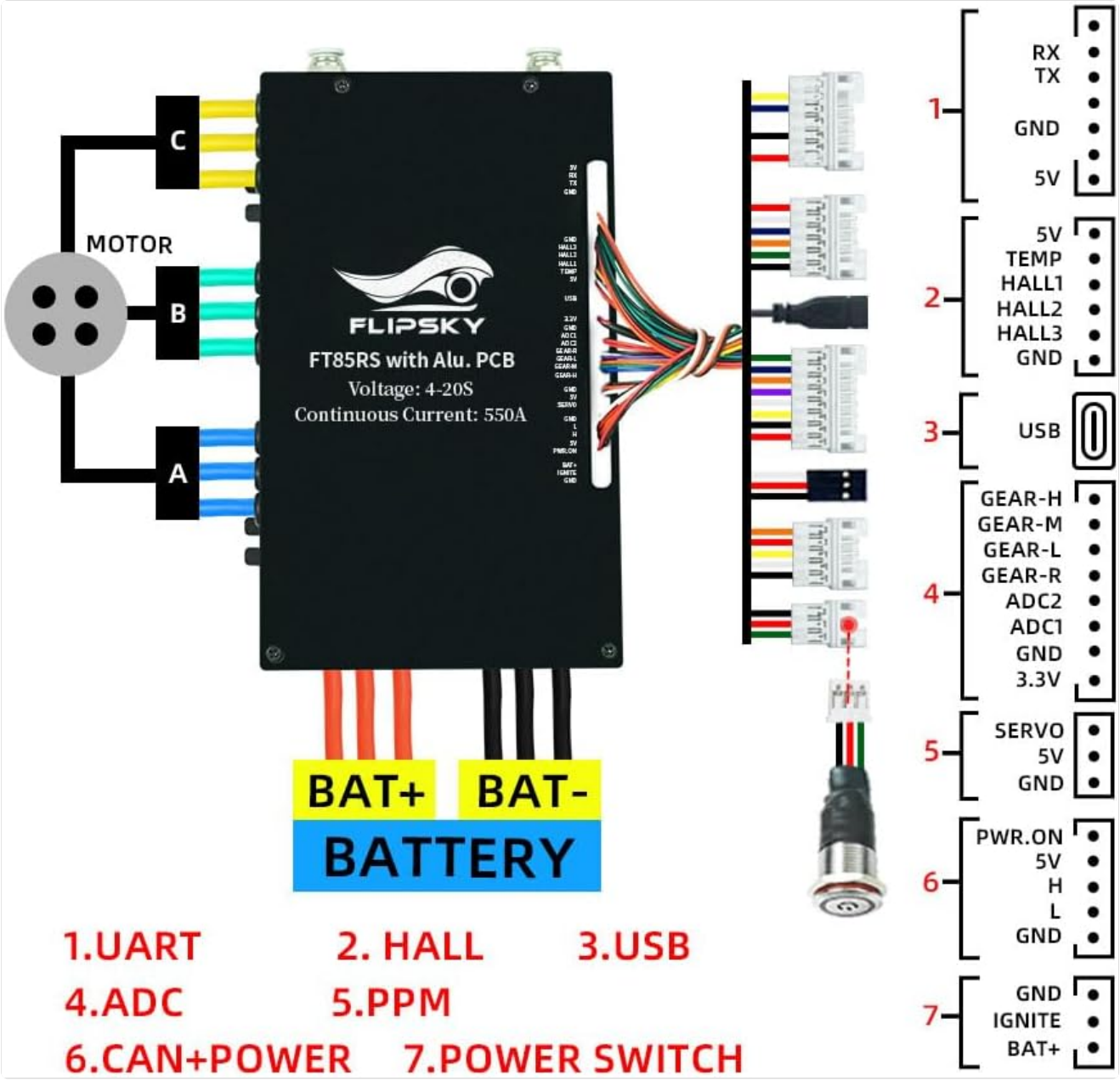

Image 6.1: Detailed connection diagram for the FLIPSKY FT85RS ESC, illustrating motor, battery, and various signal port connections.

1. **Motor Connections (A, B, C):** Connect the three phase wires from your motor to the corresponding A, B, and C terminals on the ESC. Ensure secure connections.
2. **Battery Connections (BAT+, BAT-):** Connect your battery's positive terminal to BAT+ (red wire) and negative terminal to BAT- (black wire). Double-check polarity before connecting.
3. **Water Cooling:** Connect your water cooling system to the designated inlet and outlet ports on the aluminum enclosure. Ensure proper water flow for effective heat dissipation.
4. **Signal Port Connections:** The multi-pin connector provides various signal interfaces:
    - **1. UART:** For communication with external devices like remote controls (e.g., Flipsky VX4/VX3Pro) or data logging modules.
    - **2. HALL:** For Hall sensor input from sensored motors (5V, TEMP, HALL1, HALL2, HALL3, GND).
    - **3. USB:** Connect to a computer for programming and configuration using the Flipsky ESC Tool.
    - **4. ADC:** Analog-to-Digital Converter inputs (GEAR-H, GEAR-M, GEAR-L, ADC2, ADC1, GND, 3.3V) for various analog sensor inputs or control signals.
    - **5. PPM:** Pulse Position Modulation input for standard RC receiver connections (5V, SERVO, GND).
    - **6. CAN/POWER:** CAN bus communication (RX, TX, 5V, H, L, GND) and power switch connection

(PWR.ON, 5V, H, L, GND).
    - **7. POWER SWITCH:** Dedicated port for connecting the external power switch (GND, IGNITE, BAT+).

5. **Initial Configuration:** After physical connections, connect the ESC to your computer via USB and use the Flipsky ESC Tool to configure motor parameters, battery settings, and control modes according to your specific application.

Image 6.2: Bottom view of the FT85RS ESC, highlighting the two water cooling ports for connecting the cooling system.

7. Operating Instructions

Once the FT85RS ESC is properly installed and configured, follow these general operating guidelines:

- **Power On:** Use the connected power switch to turn on the ESC. Observe any indicator lights for status.
- **Remote Control:** If using a compatible Flipsky remote (VX4, VX3Pro), ensure it is paired and configured correctly.
- **Control Modes:** The ESC supports Current and Duty Cycle control types. Select the appropriate mode via the Flipsky ESC Tool based on your application requirements.
- **Speed Gear Levels:** Utilize the programmable speed gear limits (Low, Medium, High, Reverse) to manage motor speed and torque according to your needs. These can typically be switched via your remote or external input.
- **Monitoring:** The ESC provides real-time data. Monitor parameters like voltage, current, temperature, and RPM through the Flipsky ESC Tool or compatible display units to ensure safe operation.
- **Shutdown:** Always power off the ESC using the designated power switch after use.

8. Maintenance

Regular maintenance helps prolong the lifespan and ensure reliable performance of your FT85RS ESC:

- **Cleaning:** Periodically clean the exterior of the ESC to remove dust, dirt, and debris. Use a soft, dry cloth. Avoid using solvents or harsh chemicals.
- **Connection Check:** Regularly inspect all electrical connections (motor, battery, signal wires) for looseness, corrosion, or damage. Secure any loose connections.
- **Water Cooling System:** Ensure the water cooling system is free of blockages and that water flows efficiently. Flush the system if necessary to prevent buildup.
- **Firmware Updates:** Check the Flipsky website or ESC Tool for available firmware updates. Keeping the firmware up-to-date can improve performance and add new features.

- **Storage:** When not in use for extended periods, store the ESC in a cool, dry place, away from direct sunlight and extreme temperatures.

9. Troubleshooting

If you encounter issues with your FT85RS ESC, consider the following troubleshooting steps:

Problem	Possible Cause	Solution
ESC does not power on	Loose battery connection, faulty power switch, discharged battery	Check battery connections, test power switch, charge battery
Motor not spinning or erratic behavior	Incorrect motor wiring, sensor issues, improper ESC configuration	Verify motor phase connections, check Hall sensor wiring, re-run motor detection in Flipsky ESC Tool
ESC overheating	Insufficient water cooling, excessive load, incorrect motor timing	Ensure water flow, reduce load, check motor timing settings, verify ambient temperature
No communication with Flipsky ESC Tool	Faulty USB cable, incorrect COM port selection, driver issues	Try another USB cable, select correct COM port in software, install necessary USB drivers
Protection function triggered	Over-voltage, under-voltage, over-current, over-temperature	Check battery voltage, reduce load, ensure proper cooling, review fault alerts in ESC Tool

For more detailed diagnostics and advanced troubleshooting, refer to the Flipsky ESC Tool software and online resources provided by FLIPSKY.

10. Warranty and Support

FLIPSKY products are designed for reliability and performance. For information regarding warranty coverage, technical support, or service, please visit the official FLIPSKY website or contact their customer service department. Keep your purchase receipt as proof of purchase for warranty claims.

Official FLIPSKY Website: www.flipsky.net

https://flipsky.net/
E-mail:flipskytech@outlook.com

FT85BS Manual V1.4

Specifications :

- Firmware: V1.4 or above (firmware update via Flipsky ESC Tool supported)
- Voltage: 14-84V(safe for 4-20S)
- Continuous current: 50V/60A; 75V/50A; 84V/40A (Values depend on the mounting, ambient temperature and air/water circulation around the device!)
- Peak Current: 250A
- Communication Ports: USB, CAN, UART, PPM , ADC
- Input Signals Support: PPM , ADC, UART (compatible with FLIPSKY remote VX4 and VX3Pro only at present), PAS
- Startup Modes Support: IPDS (sensorless), HFPI (sensorless), HALL (sensored), Encoder (ABI, AS5047 encoder SPI interface)
- BEC: 5V@1A
- Multiple Speed Gear levels: Low, Medium, High, Reverse
- Programmable: Yes
- Regenerative Capacity: Yes
- Motor/power wire size: 12 AWG
- Size: L110.5*W55*H30mm(Including Alu. Case)

Features:

- Adopting CPU AT32F403ARCT7 with the structure of ARM Cortex-M4 allows CPU clock speed.
- 240MHz and the max PWM switching frequency 25KHz improves the motor RPM.
- Programmable via Flipsky ESC Tool to be compatible with multi-types of motor, different battery voltages and many control ways.
- Programmable via Flipsky remote controller VX4 (remote firmware version: VX4_V1.4.0 or above).
- Supporting motor FOC with low working noise and smooth starting.
- Supporting Real-time data and fault alerts.
- Supporting adaptive variable PWM frequency control.
- Supporting sensor mode(HALL) and sensorless mode(IPDS, HFPI).
- Supporting control types: Current, Duty Cycle, Speed control, Position Control
- Protection functions: low and high voltage protection, over-current protection, temperature abnormally protection, mosfets over-temperature and over current protection, battery over discharge protecting, motor over-temperature protection.
- Supporting multiple typed of motor t emperature sensors such as NTC-10K-25℃, NTC-10K-100℃, PT1000, PTC-1K-100℃, KTY and so on.

https://flipsky.net/
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[pdf] User Manual Specifications

FB85BS flipsky esc tool software and manual linkFLIPSKY FT85RS ESC 84V 550A With Aluminum Case Water Cooling EnclosureFT85BS V1 4 20250421cdn shopify s files 1 0011 4039 1996 FT85BS 20250421 v 1745376950 |||

https://flipsky.net/ E-mail:flipskytech outlook.com FT85BS Manual V1.4 Specifications : Firmware: V1.4 or above firmware update via Flipsky ESC Tool supported Voltage: 14-84V safe for 4-20S Continuous current: 50V/60A; 75V/50A; 84V/40A Values depend on the mounting, ambient temperature and air/w...

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