

## Keenso Keensox6h89r54I1

# Keenso F4 V3S PLUS Brushless ESC Stack for FPV Drone - 45A 4 in 1 Controller User Manual

Model: Keensox6h89r54I1

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## 1. PRODUCT OVERVIEW

The Keenso F4 V3S PLUS Brushless ESC Stack is a high-performance 4-in-1 controller designed for FPV drones and RC airplanes. This integrated unit combines a flight controller and a 45A Electronic Speed Controller (ESC) into a compact design, simplifying installation and wiring.

Key features include:

- **High Performance 45A ESC:** Integrates four 45A ESCs for efficient power management and simplified setup.
- **Anti-Jamming & Fast Response:** Supports various throttle modes including Oneshot, Multishot, and Dshot for rapid signal processing and interference resistance.
- **Powerful BLHeli\_S Firmware:** Facilitates easy ESC parameter configuration, firmware updates, and compatibility with Cleanflight and Betaflight firmware.
- **Premium Craftsmanship:** Constructed with industrial-grade LDO and high-resistance MOS for enhanced durability, strong load capacity, and high-temperature resilience.
- **Enhanced Functionality:** Equipped with a gyroscope and barometer for superior control and flight stability.

## 2. PACKAGE CONTENTS

Verify that all items listed below are included in your package:

- 1 x 4-in-1 ESC (Electronic Speed Controller)
- 1 x Flight Controller
- 1 x Capacitance (Capacitor)
- 3 x Connecting Wires (various types)

- 2 x Accessories (unspecified, typically connectors or small parts)
- 8 x Damping Pads
- 4 x Nuts

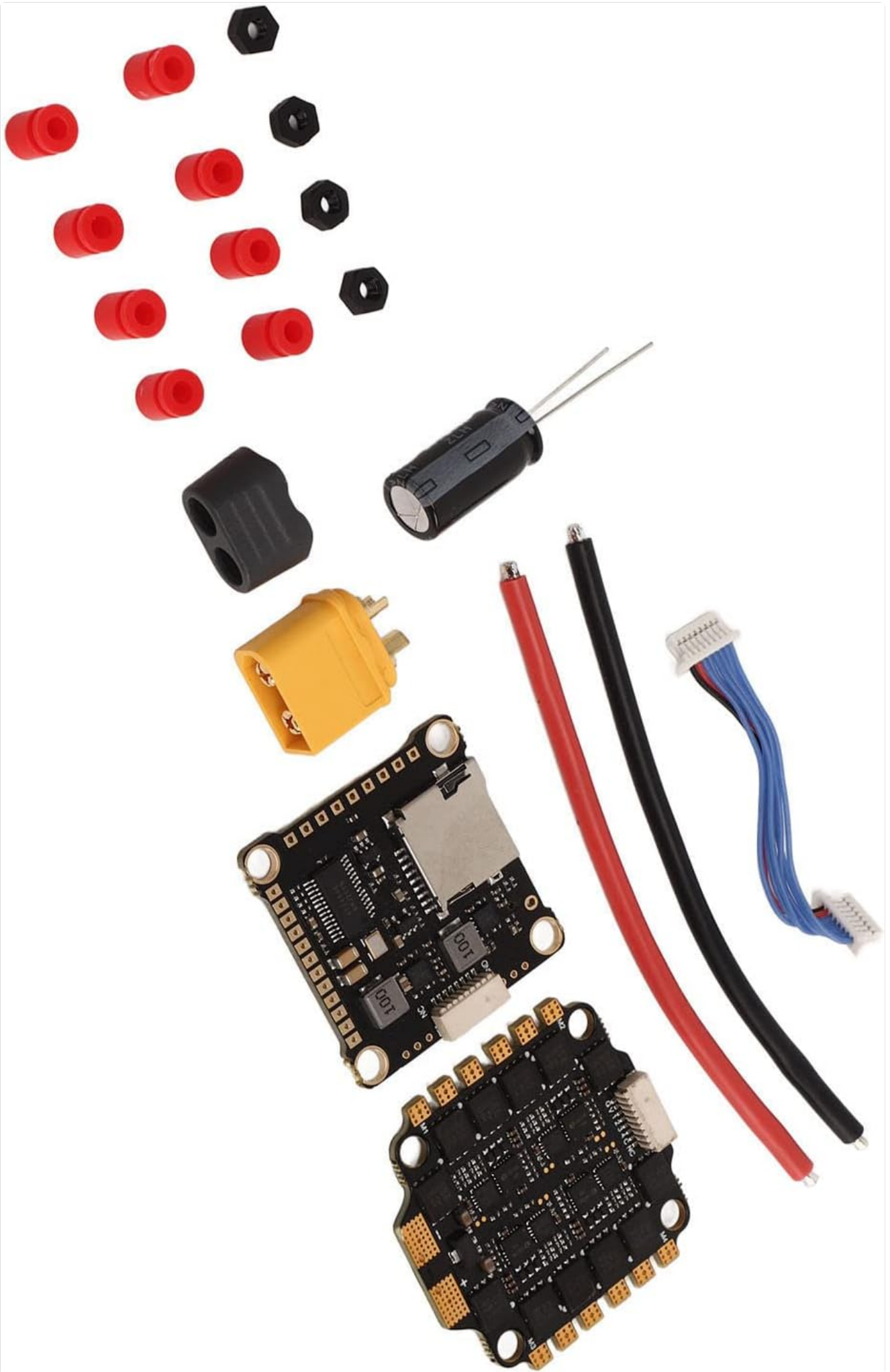


Image 2.1: Overview of all included components.

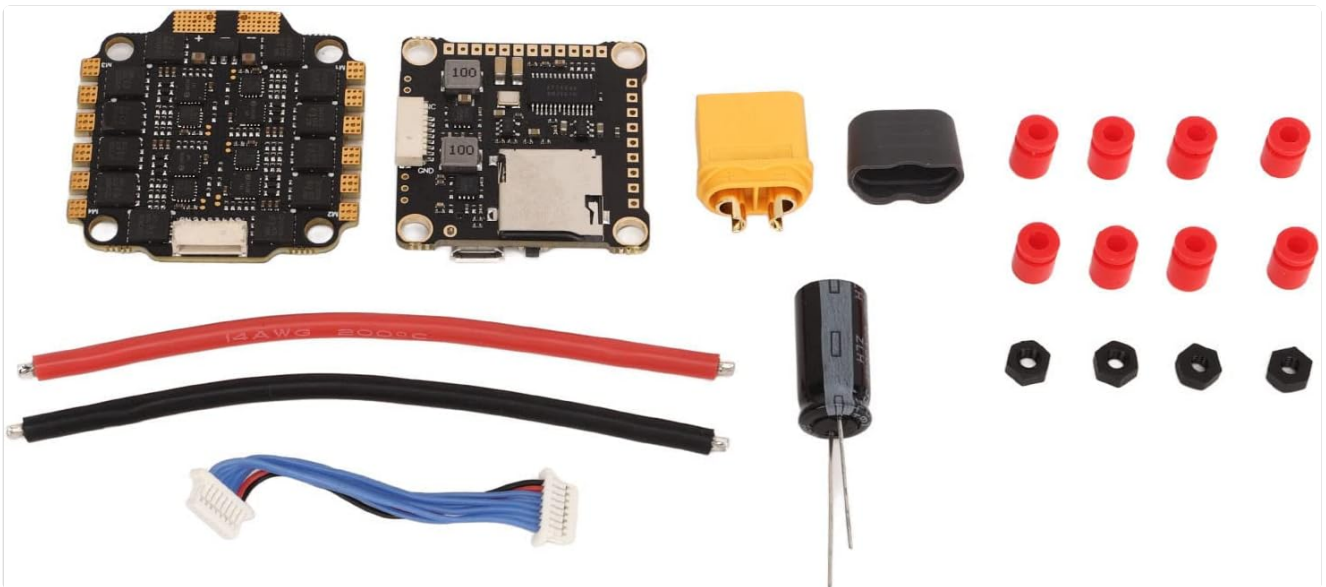


Image 2.2: Detailed view of the ESC and Flight Controller boards with accompanying parts.

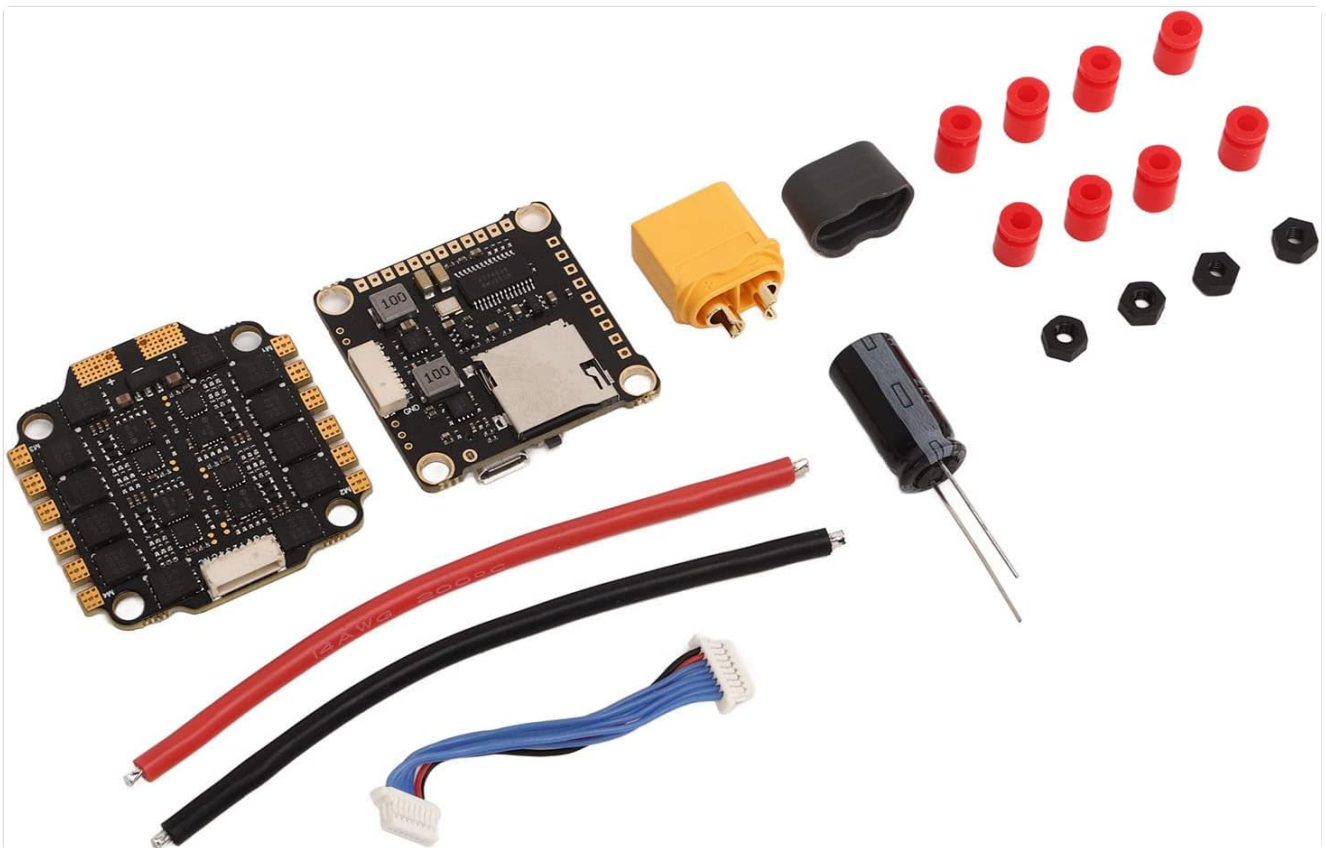


Image 2.3: Components laid out for inspection.

### 3. TECHNICAL SPECIFICATIONS

#### 3.1. 4-in-1 ESC Parameters

Parameter	Value
ESC Size	Approx. 42x41mm / 1.7x1.6in
Hole Distance	Approx. 30.5x30.5mm / 1.2x1.2in

Parameter	Value
Continuous Current	45A
Burst Current	50A (10S)
Processor	EFM8BB21F16G
Firmware	BLS J H 30 7
Drive Signal Support	DShot300/600, Multishot, Oneshot, PWM
Input Voltage	7.4 to 22.2V (2 to 6S LiPo)
ESC Weight	Approx. 12g / 0.4oz

### 3.2. Flight Controller Parameters

Parameter	Value
Controller Size	Approx. 36x36mm / 1.4x1.4in
Mounting Hole Distance	Approx. 30.5x30.5mm / 1.2x1.2in
MCU	F405
Supported Functions	Drag and drop OSD via Betaflight configuration, SBUS, PPM, Spektrum ports, Micro storage card black box
Gyroscope	Included
Barometer	BMP280
BEC Output	5V/3A, 9V/3A
Controller Weight	Approx. 7g / 0.2oz

### 3.3. General Product Information

- **Brand:** Keenso
- **Model Name:** Keensox6h89r54l1
- **Material:** Electronic component
- **Application:** FPV UAV, RC Airplanes

## 4. SETUP AND INSTALLATION

Proper installation is crucial for the performance and safety of your FPV drone or RC airplane. Always refer to the specific wiring diagrams for your frame and components.

### 4.1. Pre-Installation Checks

- Ensure your workspace is clean and static-free.
- Verify all components are present and undamaged.
- Gather necessary tools: soldering iron, solder, flux, wire cutters, heat shrink tubing, multimeter.

## 4.2. Mounting the ESC Stack

1. Attach the damping pads to the mounting holes on your frame.
2. Carefully place the 4-in-1 ESC board onto the damping pads, aligning the mounting holes.
3. Place the flight controller board on top of the ESC, ensuring proper orientation and alignment.
4. Secure the stack using the provided nuts or standoffs, ensuring not to overtighten.

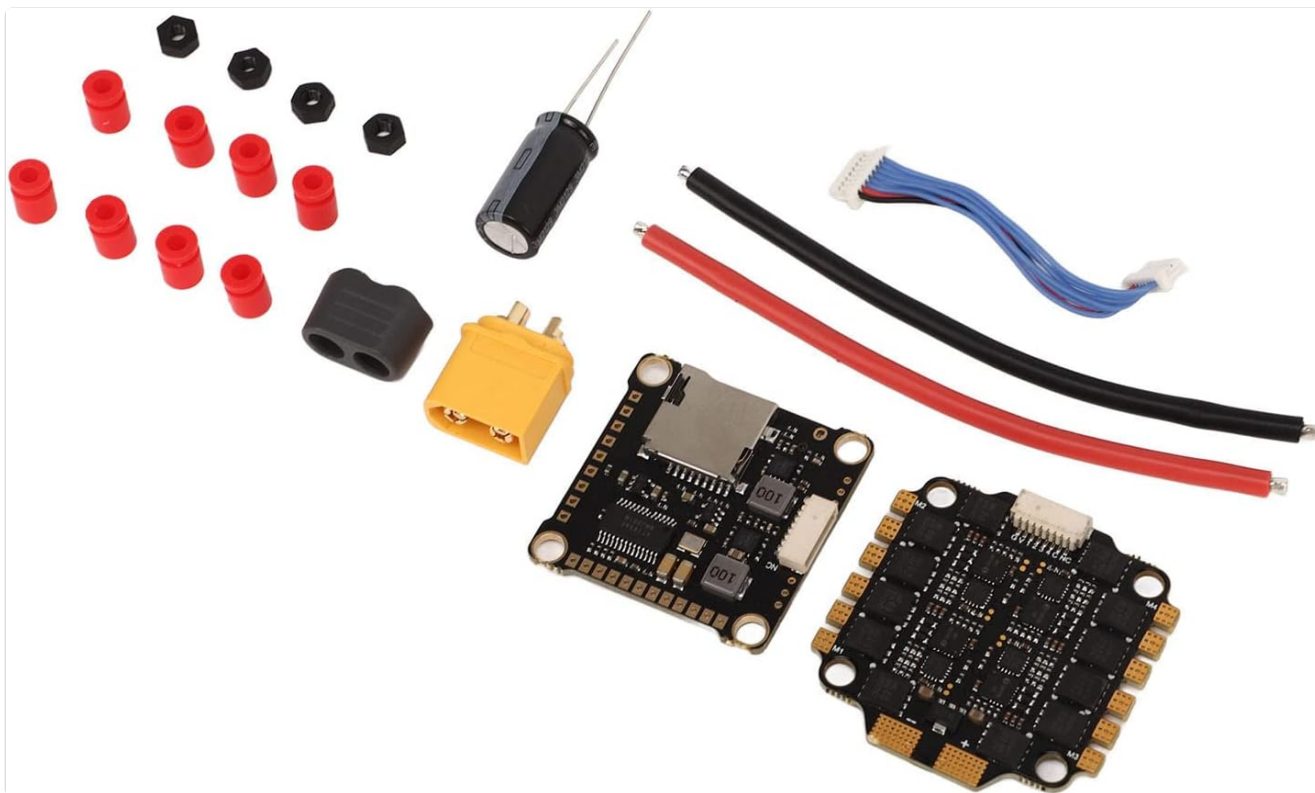


Image 4.1: Detailed view of the ESC and Flight Controller boards, highlighting mounting points.

## 4.3. Wiring Connections

Connect the ESC stack to your drone's power distribution board (PDB) or direct battery connection, motors, receiver, and other peripherals. Always double-check polarity before powering on.

- **Power Input:** Solder the main battery leads (red for positive, black for negative) to the designated pads on the 4-in-1 ESC. Ensure the capacitor is soldered across the main battery pads for voltage spike suppression.
- **Motor Connections:** Solder the three motor wires from each motor to the corresponding motor pads on the ESC. The order of wires may need adjustment in software for correct motor direction.
- **Flight Controller to ESC:** Use the provided connecting wire harness to link the flight controller to the 4-in-1 ESC. This typically carries telemetry, current sensing, and motor control signals.
- **Receiver Connection:** Connect your receiver (SBUS, PPM, or Spektrum) to the appropriate UART port on the flight controller. Refer to the flight controller's pinout diagram.
- **Other Peripherals:** Connect FPV camera, video transmitter (VTX), GPS, or other accessories to the designated pads/ports on the flight controller, paying attention to voltage requirements (5V/9V BEC outputs are available).

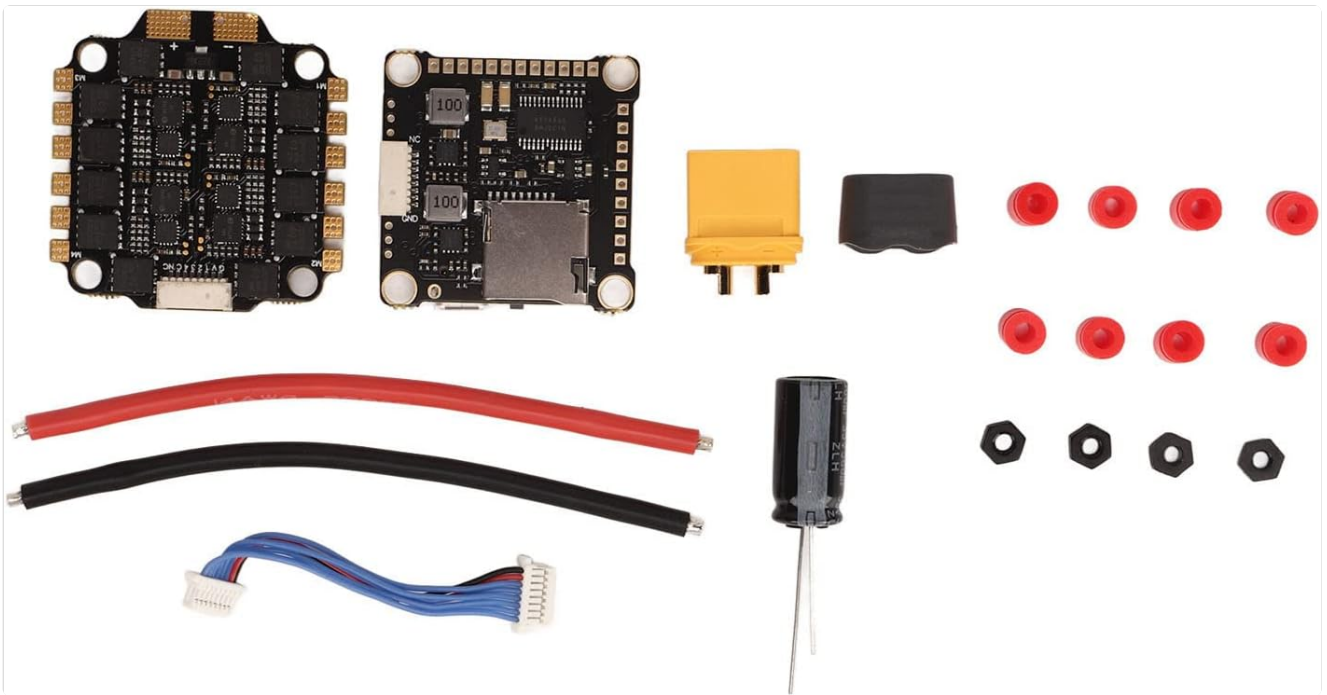


Image 4.2: Connection points on the ESC and Flight Controller.

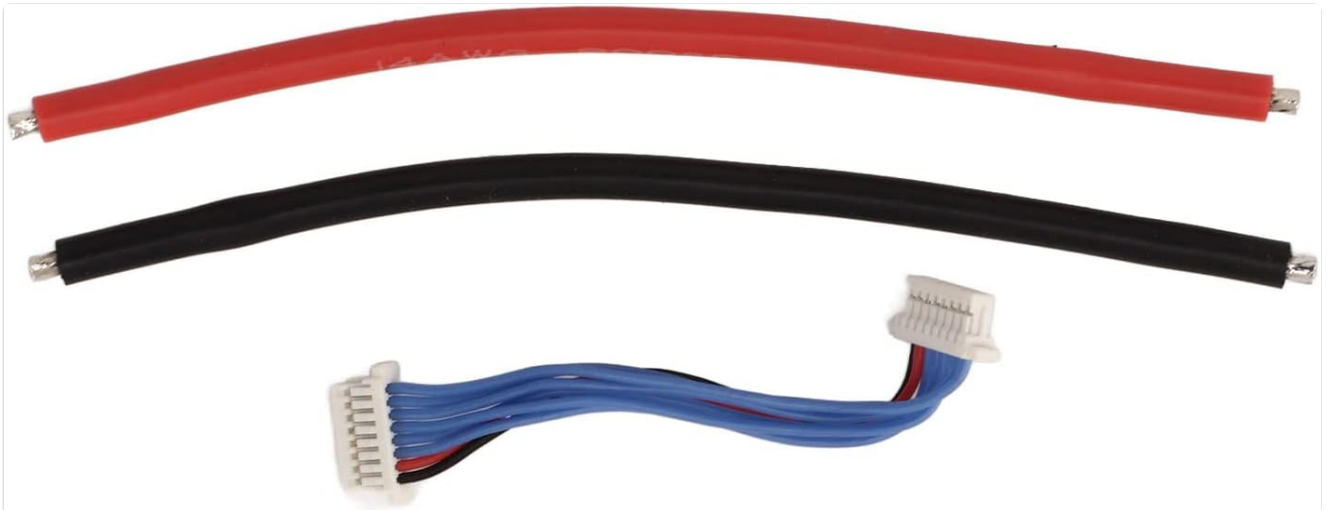


Image 4.3: Included connecting wires.





## 5. OPERATING INSTRUCTIONS

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Once installed and configured, the Keenso F4 V3S PLUS ESC Stack is ready for operation.

### 5.1. Pre-Flight Checks

- Ensure all connections are secure and free from shorts.
- Verify propeller direction and tightness.
- Check battery voltage and charge level.
- Confirm radio control link and arming switch functionality.

### 5.2. Powering On and Arming

1. Connect the flight battery to the ESC stack. You should hear a series of beeps indicating successful initialization.
2. Place the drone on a level surface.
3. Arm the motors using your configured arming switch on your radio transmitter. The motors will typically spin slowly or make a distinct sound to indicate they are armed.

### 5.3. Throttle Modes

The ESC supports various throttle protocols for precise motor control:

- **DShot300/600:** Digital protocol offering high resolution and noise immunity. Recommended for optimal performance.
- **Multishot:** Analog protocol, faster than Oneshot.
- **Oneshot125:** Analog protocol, faster than standard PWM.
- **PWM:** Standard analog protocol, generally not recommended for FPV drones due to latency.

Select the desired throttle mode in your flight controller software (e.g., Betaflight Configurator).

## 6. MAINTENANCE

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Regular maintenance helps ensure the longevity and reliability of your ESC stack.

- **Visual Inspection:** Periodically check for any signs of physical damage, loose connections, or burnt components.
- **Cleaning:** Keep the boards free from dust, dirt, and debris. Use compressed air or a soft brush. Avoid using liquids directly on the electronics.
- **Firmware Updates:** Regularly check for and apply the latest firmware updates for both the flight controller (Betaflight/Cleanflight) and ESCs (BLHeli\_S) to benefit from performance improvements and bug fixes.
- **Heat Management:** Ensure adequate airflow around the ESC stack, especially during intense flight, to prevent overheating.

## 7. TROUBLESHOOTING

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This section addresses common issues you might encounter.

### 7.1. No Power / No Initialization Beeps

- **Check Battery:** Ensure the battery is charged and properly connected.
- **Check Polarity:** Verify that the battery leads are connected with correct polarity to the ESC. Reverse polarity

can cause severe damage.

- **Inspect Soldering:** Look for cold solder joints or bridges on the main power pads.

## 7.2. Motors Not Spinning / Incorrect Direction

- **Arming:** Ensure the flight controller is armed.
- **Motor Connections:** Verify all motor wires are securely soldered to the ESC.
- **BLHeli\_S Configuration:** Use BLHeliSuite to check motor direction and calibrate ESCs. Motor direction can be reversed in the software.
- **Throttle Protocol:** Confirm the correct DShot/Multishot/Oneshot protocol is selected in Betaflight/Cleanflight.

## 7.3. Unstable Flight / Jittery Motors

- **PID Tuning:** Adjust PID settings in Betaflight/Cleanflight.
- **Damping Pads:** Ensure the ESC stack is properly mounted on damping pads to reduce vibrations.
- **Propellers:** Check for damaged or unbalanced propellers.
- **Capacitor:** Verify the capacitor is correctly installed across the main power leads to filter electrical noise.

## 7.4. USB Connection Issues

- **USB Cable:** Try a different USB cable, ensuring it is a data-capable cable.
- **Drivers:** Install necessary drivers (e.g., STM32 Virtual COM Port Driver, Zadig for DFU mode) for your flight controller.
- **Configurator:** Ensure you are using the correct version of Betaflight/Cleanflight Configurator.

## 8. WARRANTY AND SUPPORT

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For warranty information and technical support, please refer to the official Keenso website or contact your retailer.

Keep your proof of purchase for any warranty claims.

This product has no known safety hazards to users when installed and operated correctly.