

## Fafeicy V4.12

# Fafeicy Flipsky ESC V4.12 50A Electronic Speed Control User Manual

Model: V4.12

## 1. INTRODUCTION

This manual provides essential information for the proper installation, operation, and maintenance of your Fafeicy Flipsky ESC V4.12 50A Electronic Speed Control. This ESC is designed for various applications, including DIY electric skateboards, scooters, and robots, offering precise motor control, smooth starts, and reliable electric braking. It is based on the VESC open-source project, ensuring compatibility with VESC software for advanced configuration.

## 2. PRODUCT OVERVIEW

The Fafeicy Flipsky ESC V4.12 is a compact and highly adaptable electronic speed controller. It features a continuous current capacity of 50A and supports a wide voltage range, making it suitable for various power systems. Its design prioritizes safety and performance with temperature and current limits.

### 2.1. Key Features

- **High Current Capacity:** Continuous 50A, with peak capabilities up to 240A, depending on installation and ambient temperature.
- **VESC Software Compatibility:** Based on the VESC open-source project, allowing for extensive customization and adjustments.
- **Smooth Start and Electric Brake:** Enables sensorless motor smooth starts and provides powerful, reliable, and progressive electric braking.
- **Versatile Applications:** Ideal for DIY electric skateboard conversions, scooters, robots, and other similar projects.
- **Compact Design:** Small and lightweight, suitable for integration into various setups.

### 2.2. Package Contents

- 1 x Electronic Speed Control (Fafeicy Flipsky ESC V4.12)
- 1 x USB Cable
- 1 x VESC Sensor Line
- 1 x Manual (this document)



Image 2.1: The Fafeicy Flipsky ESC V4.12 Electronic Speed Control, shown with its accompanying USB cable and VESC sensor line.



Image 2.2: Rear view of the ESC, highlighting the capacitors and main power wiring connections.

### 3. SPECIFICATIONS

The following table details the technical specifications of the Fafeicy Flipsky ESC V4.12:

Feature	Specification
Hardware Version	V4.12
EPRM	60000
Firmware	V3.40 (Retain the Latest Firmware Version)
PCB Layers	4 Layers
PCB Size	Approx. 40 x 60mm / 1.57 x 2.36in
Continuous Current	50A (Continuous) / 240A (Peak) - <i>Depends on installation and ambient temperature</i>
Voltage Range	8-60V (3S to 12S Lipo) - <i>Voltage must not exceed 60V</i>
Recommended Battery	10S Lipo (not included)
BEC Output	5V@1.5A

Feature	Specification
BEC Type	Internal Driver Support
Time Calibration	Software Calibration
Motor Control Interface	PPM (RC Servo), Analog, UART, I2C, USB, CAN Bus
Cut-Off Voltage	Programmable
Frequency	PWM Input
Governor	No
Weight	Approx. 80g / 0.18lb
Dimensions	Approx. 110x40x20mm / 4.3 x 1.6 x 0.8in
Programming Card	No (Software-based configuration)
Reverse Function	Yes
Motor Wire Gauge	12AWG
Power Cord Gauge	12AWG

## 4. SETUP AND INSTALLATION

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Careful installation is crucial for the safe and optimal performance of your ESC. Ensure all connections are secure and correctly oriented.

### 4.1. Connection Diagram

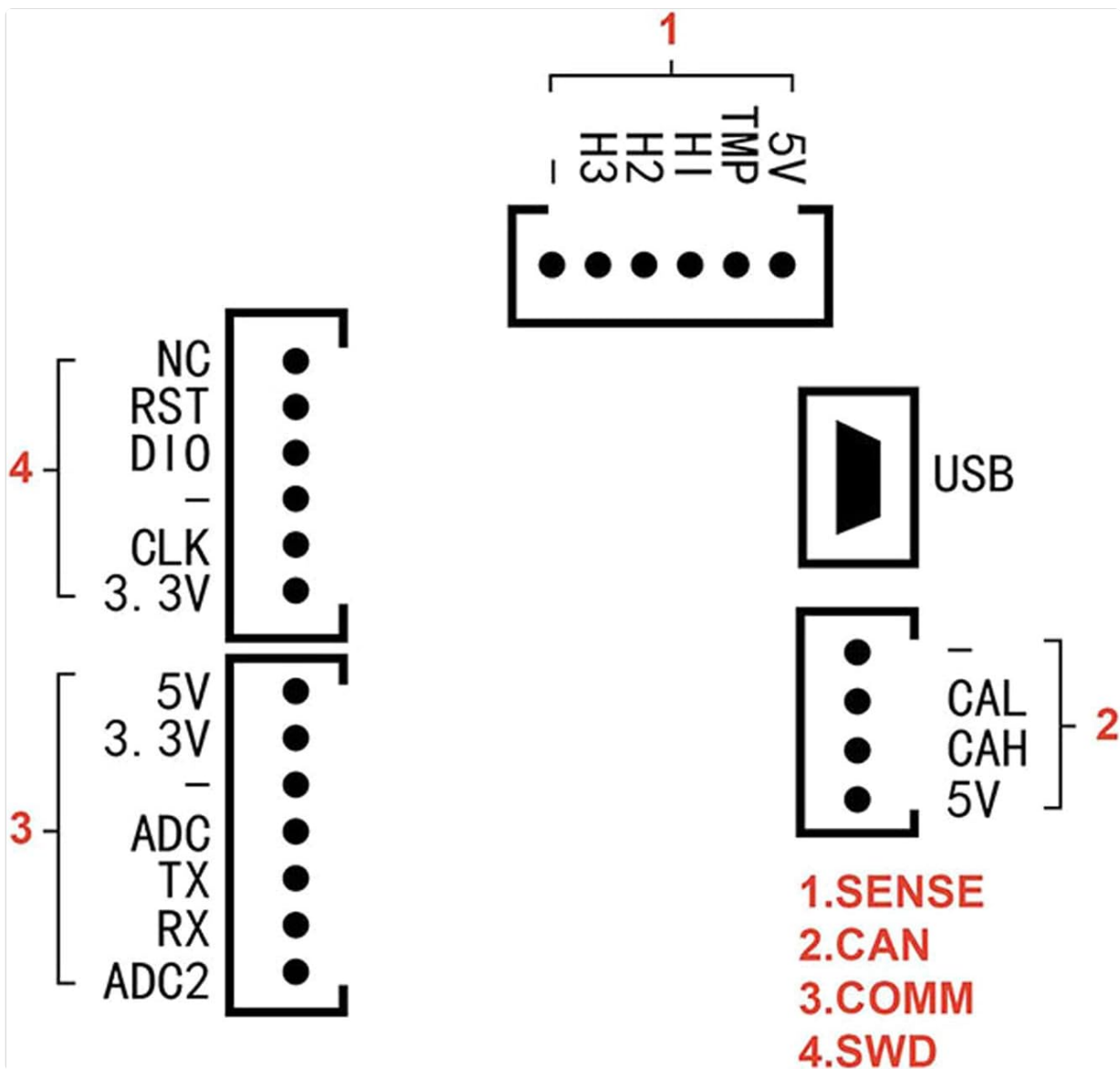


Image 4.1: Connection diagram illustrating the various ports and their functions on the ESC.

## 4.2. Wiring Instructions

1. **Motor Connection:** Connect the three motor phase wires (typically 12AWG) from your motor to the corresponding output terminals on the ESC. Ensure a secure connection.
2. **Battery Connection:** Connect the main power wires (typically 12AWG) from your battery (3S to 12S Lipo, 8-60V) to the ESC's power input. Observe correct polarity (red for positive, black for negative). **Caution: Do not exceed 60V.**
3. **Sensor Line Connection:** If your motor is sensed, connect the VESC sensor line (included) from the motor's sensor port to the designated sensor port on the ESC (labeled 'SENSE' in the diagram).
4. **Control Input:** Connect your receiver or control device to the appropriate motor control interface (PPM, Analog, UART, I2C, CAN Bus) on the ESC. For PPM (RC Servo) control, connect the signal, power, and ground wires.
5. **USB Connection:** Use the provided USB cable to connect the ESC to a computer for initial configuration and firmware updates via VESC software.

## 4.3. Important Note on LED Button

**By default, the LED button has been inserted into the switch at the factory. Please do not turn on the power of the switch without the LED button connected. Disconnecting the LED button while the switch is powered on may cause damage to the ESC.**

## 5. OPERATING INSTRUCTIONS

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The Fafeicy Flipsky ESC V4.12 is configured and operated primarily through VESC software. This software allows for detailed parameter adjustments to match your specific motor and battery setup.

### 5.1. Initial Configuration with VESC Software

1. **Software Installation:** Download and install the latest VESC Tool software on your computer.
2. **Connect ESC:** Connect the ESC to your computer using the provided USB cable.
3. **Detect ESC:** Launch VESC Tool and connect to the ESC. The software should detect your V4.12 hardware.
4. **Motor Setup Wizard:** Use the motor setup wizard within VESC Tool to automatically detect your motor's parameters and configure basic settings. This is crucial for smooth operation.
5. **Parameter Adjustment:** Fine-tune parameters such as battery voltage limits, motor current limits, brake strength, and control modes according to your application and safety requirements.
6. **Save Configuration:** Always save your configuration to the ESC and back up your settings on your computer.

### 5.2. Operation

- **Smooth Start:** The ESC is designed to provide a smooth, controlled start for sensorless motors, preventing sudden jerks.
- **Electric Brake:** The electric brake offers proportional and powerful stopping force. Adjust its intensity via VESC software.
- **Multiple Control Modes:** The ESC supports various control modes (e.g., current control, duty cycle control, PID speed control) configurable through VESC software to suit different applications.

## 6. MAINTENANCE

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Proper maintenance ensures the longevity and reliable performance of your ESC.

- **Keep Clean and Dry:** Regularly inspect the ESC for dust, dirt, or moisture. Clean with a soft, dry brush or compressed air. Avoid exposure to water or excessive humidity.
- **Check Connections:** Periodically verify that all wire connections (motor, battery, sensor, control) are secure and free from corrosion or damage. Loose connections can lead to intermittent operation or damage.
- **Temperature Management:** Ensure adequate airflow around the ESC, especially during high-current operation, to prevent overheating. The ESC has built-in temperature limits, but good thermal management is essential.
- **Firmware Updates:** Check the VESC project website periodically for firmware updates. Updating firmware can improve performance, add features, or fix bugs. Follow update instructions carefully.
- **Physical Inspection:** Look for any signs of physical damage, such as cracked components, burnt spots, or damaged insulation on wires.

## 7. TROUBLESHOOTING

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If you encounter issues with your ESC, refer to the following common troubleshooting steps:

- **No Power/No Response:**

- Check battery voltage and ensure it is within the 8-60V range.
- Verify all power connections are secure and correctly polarized.
- Ensure the LED button is properly connected to the switch before powering on, as per the warning in Section 4.3.

- **Motor Not Spinning/Erratic Behavior:**

- Confirm motor phase wire connections are correct and secure.
- If using a sensored motor, check the sensor line connection.
- Connect to VESC Tool and run the motor detection wizard again.
- Check for any fault codes reported in VESC Tool.
- Verify control input (PPM, UART, etc.) is correctly configured and receiving signals.

- **Overheating:**

- Ensure adequate ventilation around the ESC.
- Reduce motor current limits in VESC Tool if consistently overheating.
- Check for short circuits or excessive load on the motor.

- **USB Connection Issues:**

- Try a different USB port or cable.
- Ensure VESC Tool is the correct version for your operating system.
- Check device manager for driver issues.

For persistent issues, consult the VESC community forums or contact Fafeicy customer support.

## 8. SAFETY INFORMATION

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Operating electronic speed controllers and high-power motors can be dangerous if proper precautions are not taken. Adhere to the following safety guidelines:

- **Voltage Limits:** Never exceed the maximum input voltage of 60V. Over-voltage will permanently damage the ESC.
- **Polarity:** Always observe correct battery polarity. Reverse polarity will cause immediate and irreversible damage.
- **Short Circuits:** Prevent short circuits on all connections, especially battery and motor wires. Use appropriate insulation.
- **Heat:** The ESC can generate significant heat during operation. Ensure it is mounted in a location with adequate cooling and avoid touching it immediately after use.
- **Moving Parts:** Keep hands, hair, and loose clothing away from rotating motors and propellers (if applicable) when the system is powered.
- **Battery Handling:** Use appropriate safety measures when handling LiPo batteries, including proper charging, storage, and discharge practices.
- **Environment:** Do not operate the ESC in wet conditions or environments with conductive debris.
- **Supervision:** Always supervise the operation of high-power systems, especially during initial testing.

## 9. WARRANTY AND SUPPORT

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For detailed warranty information, terms, and conditions, please refer to the manufacturer's official website or your point of purchase. Technical support and further assistance can also be obtained through these channels.