ApisQueen Lightning 35A

ApisQueen 35A BLHeli_S Electronic Speed Controller User Manual

Model: Lightning 35A | Brand: ApisQueen

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of your ApisQueen 35A BLHeli_S Electronic Speed Controller (ESC). These ESCs are designed for high-performance applications such as FPV racing drones, multicopters, and underwater thrusters, supporting 2S-6S Lipo batteries and Dshot 150/300/600 digital throttle protocols. Please read this manual thoroughly before use to ensure safe and optimal performance.

2. Safety Information

- Always disconnect the battery before performing any installation, maintenance, or inspection.
- Ensure correct polarity when connecting the ESC to the battery. Incorrect connections can cause severe damage to the ESC and other components.
- Avoid short circuits. Insulate all exposed wires and solder joints.
- Operate in a well-ventilated area. ESCs can generate heat during operation.
- Keep away from water and moisture unless specifically designed for underwater use and properly sealed.
- Children should only operate this product under direct adult supervision.
- Do not modify the ESC hardware. Unauthorized modifications will void the warranty and may lead to malfunction.

3. Package Contents

The package includes the following items:

- 4 x ApisQueen 35A BLHeli_S Electronic Speed Controllers

Figure 3.1: Four ApisQueen 35A BLHeli_S Electronic Speed Controllers as included in the package. Each ESC features a compact design with pre-attached power and signal wires.

4. Product Overview

The ApisQueen 35A BLHeli_S ESC is a high-performance electronic speed controller designed for demanding applications. It features a compact form factor and robust construction, incorporating a 6-layer, 3-ounce thickness copper PCB with a gold plating process for enhanced current resistance and heat dissipation. The ESC natively supports BLHeli_S firmware and various digital and analog throttle signals.

Key Features:

- **BLHeli_S Firmware:** Optimized for multirotors, providing smooth and responsive motor control.
- **Damped Light Hardware:** Default hardware pulse width modulation (PWM) for low noise and improved response.

- **Dshot Support:** Natively supports Dshot150, Dshot300, and Dshot600 digital throttle protocols for strong anti-interference ability and fast response.
- **RGB LED Night Light:** Integrated multi-color RGB LEDs for enhanced visibility and aesthetics during night flights.
- **Robust PCB Design:** 6-layer, 3-ounce copper PCB with gold plating for superior current handling and heat management.
- **Wide Voltage Range:** Supports 2S-6S LiPo battery input.

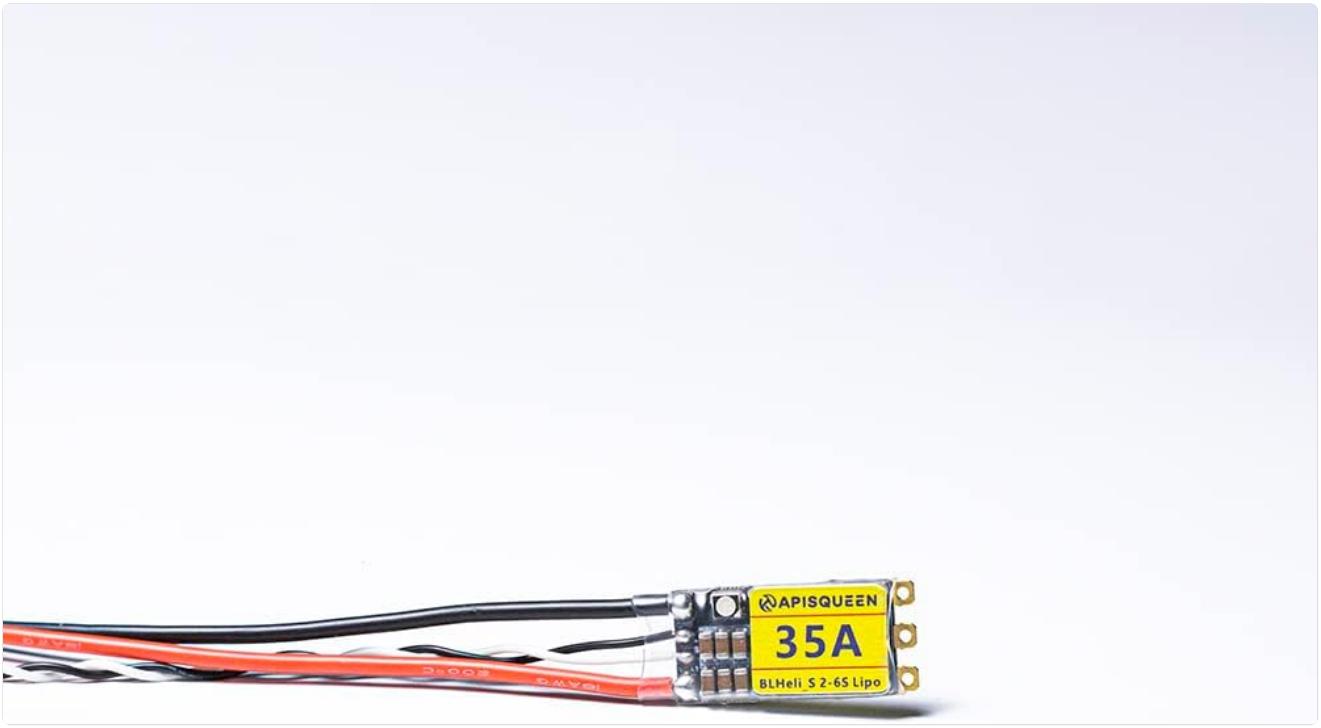


Figure 4.1: A single ApisQueen 35A BLHeli_S ESC, showcasing its compact design and the "APISQUEEN 35A BLHeli_S 2-6S Lipo" labeling. The board includes solder pads for connections.

Figure 4.2: An alternative perspective of the ApisQueen 35A BLHeli_S ESC, highlighting the integrated wires for power and signal connections. The small form factor is evident.

5. Setup and Installation

Proper installation is crucial for the performance and longevity of your ESCs. Follow these steps carefully:

5.1 Wiring Connections:

1. **Motor Connection:** Connect the three motor wires to the three output pads/wires on the ESC. The order of connection determines the motor's rotation direction. If the motor spins in the wrong direction, swap any two of the three motor wires.
2. **Power Connection:** Connect the red wire (positive) and black wire (negative) from the ESC to your flight controller's power distribution board (PDB) or directly to the battery connector, ensuring correct polarity. The ESC supports 2S-6S LiPo input.

3. **Signal Connection:** Connect the signal wire (typically white or yellow) from the ESC to the corresponding motor signal pad on your flight controller. The ground wire (black, often twisted with the signal wire) should also be connected to the flight controller's ground.

Figure 5.1: A single ApisQueen 35A BLHeli_S ESC with its pre-attached wires. The thicker red and black wires are for power input, while the thinner twisted black and white wires are for the signal connection to the flight controller.

5.2 Mounting:

Mount the ESCs securely to your drone frame, ensuring they are protected from vibrations and potential impact. Use appropriate mounting hardware or double-sided tape. Ensure adequate airflow around the ESCs for cooling.

6. Operating Instructions

The ApisQueen 35A ESCs come pre-flashed with BLHeli_S firmware, offering advanced features and configuration options.

6.1 BLHeli_S Configuration:

To configure the ESCs, you will need to connect your flight controller to a computer and use the BLHeliSuite software (available online). This software allows you to:

- Update firmware to the latest version.
- Change motor direction (if not done by swapping wires).
- Adjust various parameters such as motor timing, startup power, and PWM frequency.
- Calibrate throttle range (though Dshot protocols do not require traditional throttle calibration).

Refer to the BLHeliSuite documentation for detailed instructions on using the software.

6.2 Throttle Protocols:

These ESCs support multiple throttle signal modes:

- **Dshot150/300/600:** Digital protocols offering high precision, strong noise immunity, and no need for throttle calibration. Recommended for optimal performance.
- **PWM:** Standard analog pulse width modulation (1000µs-2000µs).

- **Oneshot125:** (125-250µs) Faster analog protocol.
- **Oneshot42:** (42-82µs) Even faster analog protocol.
- **Multishot:** (2-25µs) Very fast analog protocol.

Ensure your flight controller is configured to output the desired throttle protocol that matches the ESC's capabilities.

7. Maintenance

Regular maintenance helps ensure the longevity and reliable operation of your ESCs.

- **Inspection:** Periodically inspect the ESCs for any signs of physical damage, such as cracked components, frayed wires, or burnt areas.
- **Cleaning:** Gently clean the ESCs with a soft brush or compressed air to remove dust, dirt, or debris. Avoid using liquid cleaners unless specifically designed for electronics and ensure the ESC is completely dry before powering on.
- **Connections:** Check all solder joints and connectors for secure attachment. Re-solder any loose connections.
- **Heat Management:** Ensure ESCs are not consistently overheating. If they are, check for proper airflow, motor issues, or consider reducing propeller size/pitch.

8. Troubleshooting

If you encounter issues with your ApisQueen 35A ESCs, refer to the following common troubleshooting steps:

8.1 Motor Not Spinning / Irregular Operation:

- **Check Connections:** Verify all motor, power, and signal connections are secure and correctly wired.
- **Motor Direction:** If a motor spins in the wrong direction, swap any two of its three wires connected to the ESC, or change the direction in BLHeliSuite.
- **Flight Controller Configuration:** Ensure the flight controller is sending the correct throttle signals and that the motor outputs are mapped correctly.
- **BLHeli_S Settings:** Connect to BLHeliSuite and check ESC settings. Ensure motor timing is appropriate for your motor.
- **Power Supply:** Confirm the battery is fully charged and providing adequate voltage (2S-6S LiPo).

8.2 ESC Overheating:

- **Airflow:** Ensure ESCs have sufficient airflow for cooling. Avoid enclosing them in tight spaces without ventilation.
- **Propeller Size/Pitch:** Overly aggressive propellers can draw too much current, leading to overheating. Consider smaller or lower-pitch propellers.
- **Motor Issues:** A damaged or inefficient motor can cause the ESC to work harder and overheat. Inspect motors for damage.
- **Short Circuit:** Check for any intermittent short circuits in the motor windings or wiring.

8.3 ESC Not Responding:

- **Power Check:** Verify the ESC is receiving power from the battery.
- **Signal Check:** Ensure the signal wire is properly connected to the flight controller and the flight controller is powered on and functioning.
- **Firmware Corruption:** Attempt to re-flash the BLHeli_S firmware using BLHeliSuite.

9. Specifications

ApisQueen 35A BLHeli_S ESC Technical Specifications

Feature	Specification
Continuous Current	35A
Burst Current	Not specified (typically higher than continuous)
Input Voltage	2-6S LiPo
Firmware	BLHeli_S
Throttle Protocols Supported	Dshot150/300/600, PWM, Oneshot125, Oneshot42, Multishot
Special Features	Damped Light, Integrated RGB LED, 6-layer 3oz Gold Plated PCB
Dimensions	Approximately 1.25 x 0.53 x 0.2 inches (31.75 x 13.46 x 5.08 mm)
Weight	Approximately 1.13 ounces (32 grams) for the set of 4, or ~8 grams per ESC

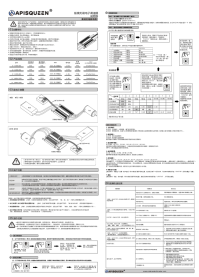
Figure 9.1: An ApisQueen 35A BLHeli_S ESC positioned alongside a ruler, illustrating its compact dimensions for easy integration into various drone builds.

10. Warranty and Support

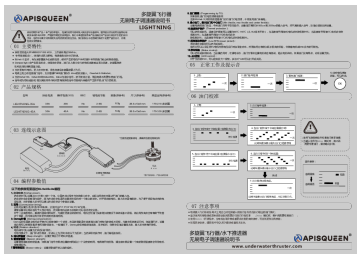
ApisQueen products are manufactured to high-quality standards. While specific warranty details are not provided in this manual, please retain your proof of purchase for any warranty claims. For technical support, firmware updates, or further assistance, please refer to the official ApisQueen website or contact their customer service through your point of purchase.

Always ensure you are using genuine ApisQueen parts and following recommended guidelines to maintain product integrity and warranty validity.

Related Documents

	APISQUEEN O'Hara Series Brushless ESC for RC Boats User Manual User manual for APISQUEEN O'Hara series brushless electronic speed controllers (ESCs) designed for RC boats. Covers features, specifications, wiring diagrams, protection functions, operation instructions, and troubleshooting for models 50A, 70A, 90A, 120A, and 150A.

Documents - ApisQueen – Lightning 35A



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