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HGLRC Specter 40A 4-6S AIO

HGLRC Specter 40A 4-6S AIO Instruction Manual

Model: Specter 40A 4-6S AIO

Brand: HGLRC

1. Introduction

This manual provides comprehensive instructions for the installation, operation, and maintenance of the HGLRC Specter 40A 4-6S AIO (All-In-One) Flight Controller. Designed for FPV racing drones and quadcopters, this AIO board integrates a flight controller (FC) and electronic speed controller (ESC) into a single compact unit, offering stable performance and versatile connectivity.

2. Key Features

- **Integrated MPU6000 Gyroscope:** Ensures stable flight attitude and enhanced flight stability.
- **High-Performance STM32 F722 MCU:** Provides robust processing power for flight control.
- **40A Continuous Current ESC:** Supports 4-6S LiPo input with a peak current of 50A (10S).
- **HD/Analog Two-in-One Direct Plug Interface:** Simplifies connection for cameras and video transmitters.
- **GPS Support:** Enables GPS positioning mode for features like one-key return.
- **Pre-flashed BL Firmware:** Comes with BL firmware, with an option to flash Bluejay for improved flight efficiency.
- **Compact Design:** Suitable for mainstream 2-4 inch ring machines and toothpick racks.
- **16MB Black Box:** For flight data logging and tuning.
- **Waterproof Coating:** High-density waterproof coating for enhanced durability.



Image: The HGLRC Specter 40A AIO board, highlighting the MPU6000 gyroscope for stable output.



Image: Close-up of the AIO board, emphasizing the integrated high-performance STM32 F722 main control unit.

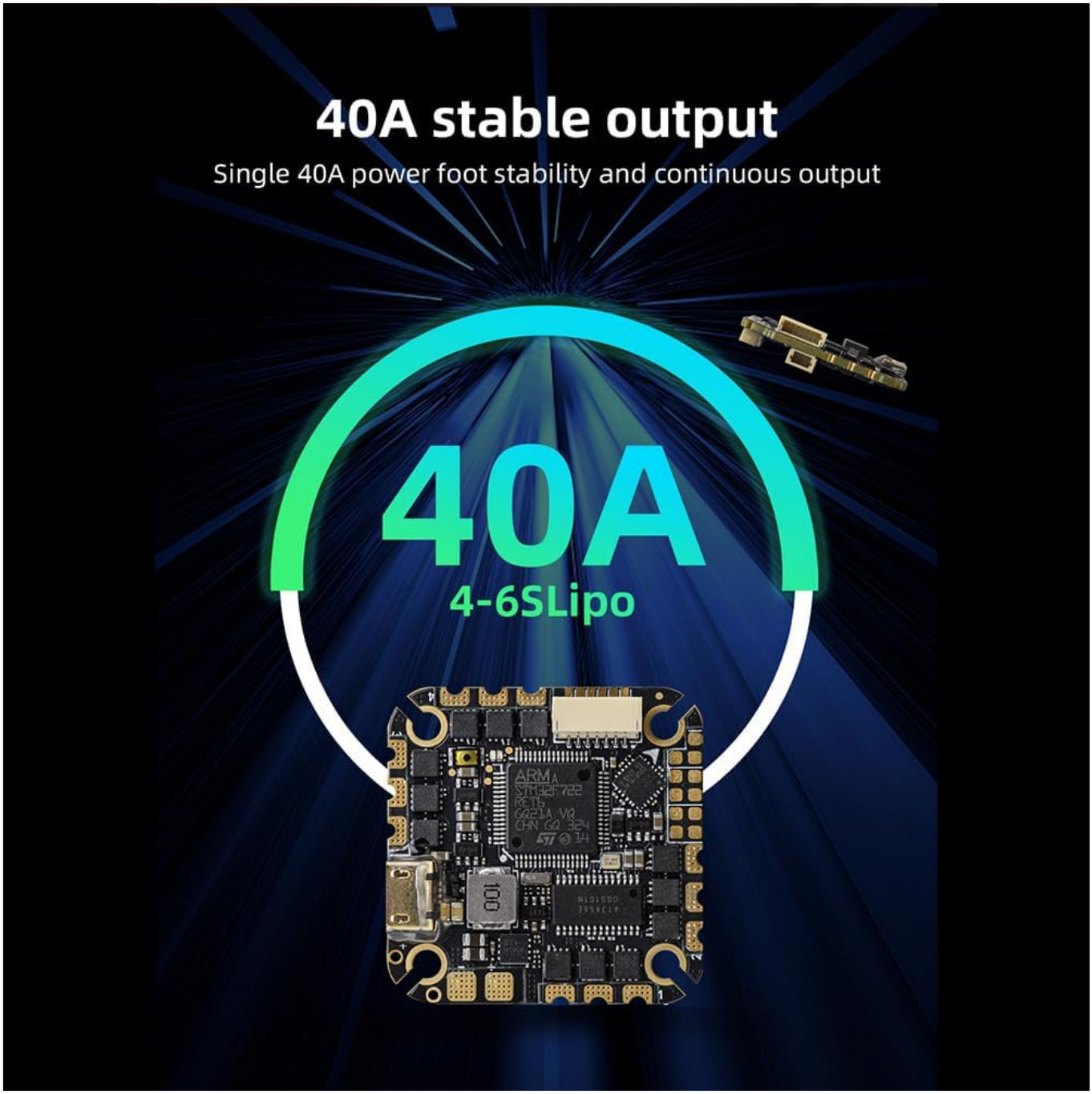

Image: Diagram illustrating the 40A continuous current capability, supporting 4-6S LiPo batteries.

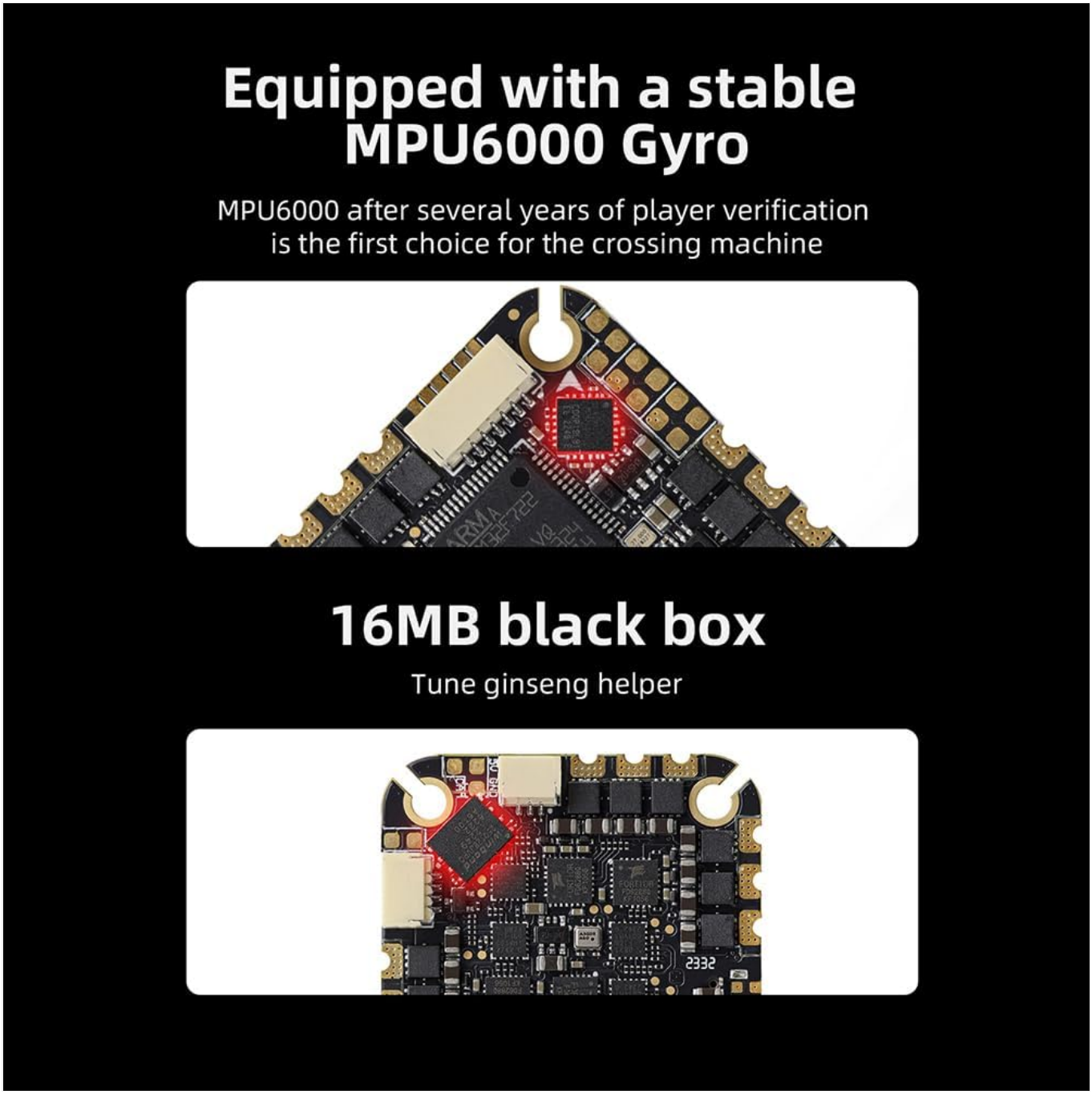

Image: Visual representation of the MPU6000 Gyro and the 16MB black box for flight data logging.

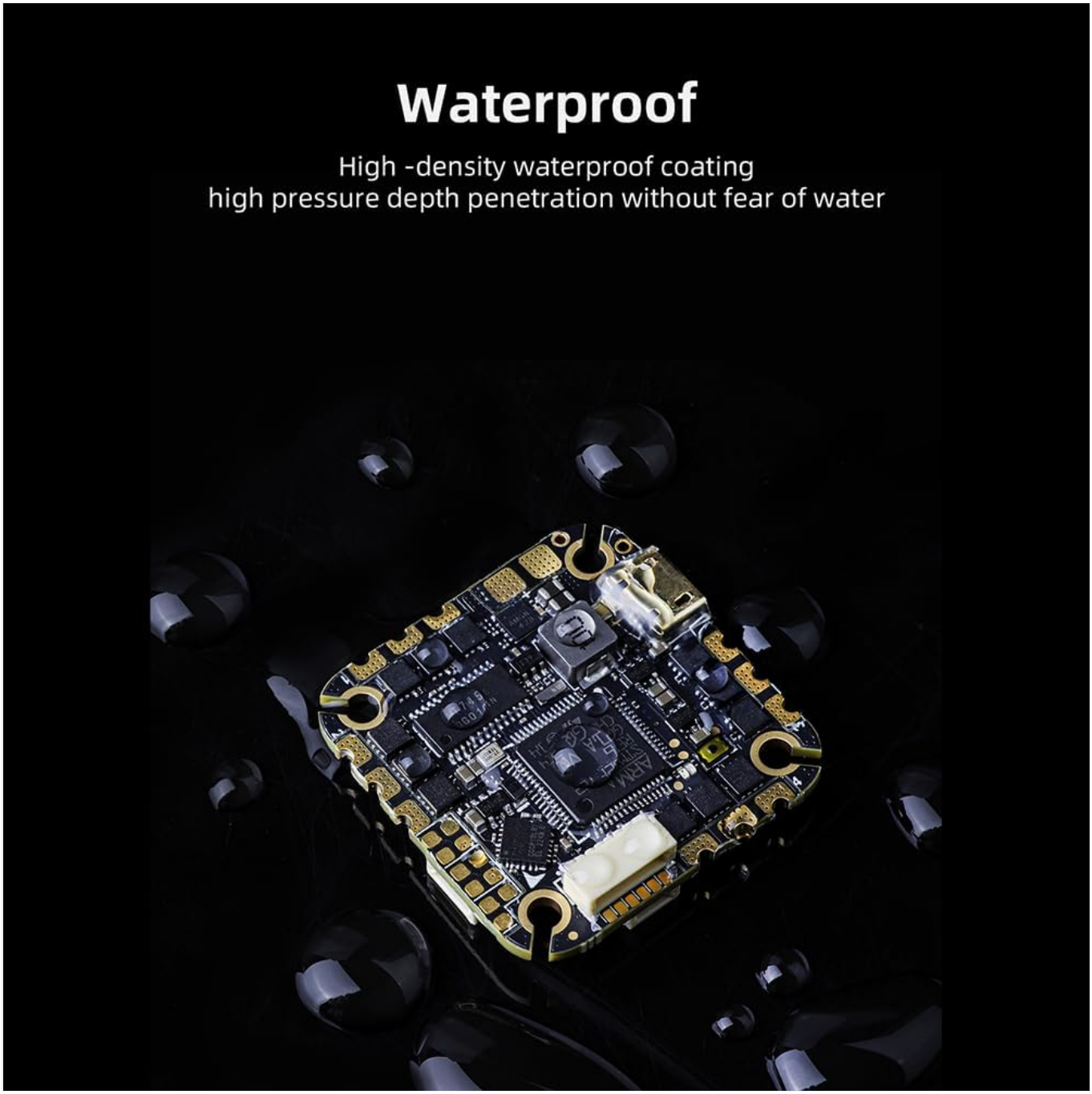

Image: The AIO board with a visual representation of its high-density waterproof coating, indicating resistance to water.

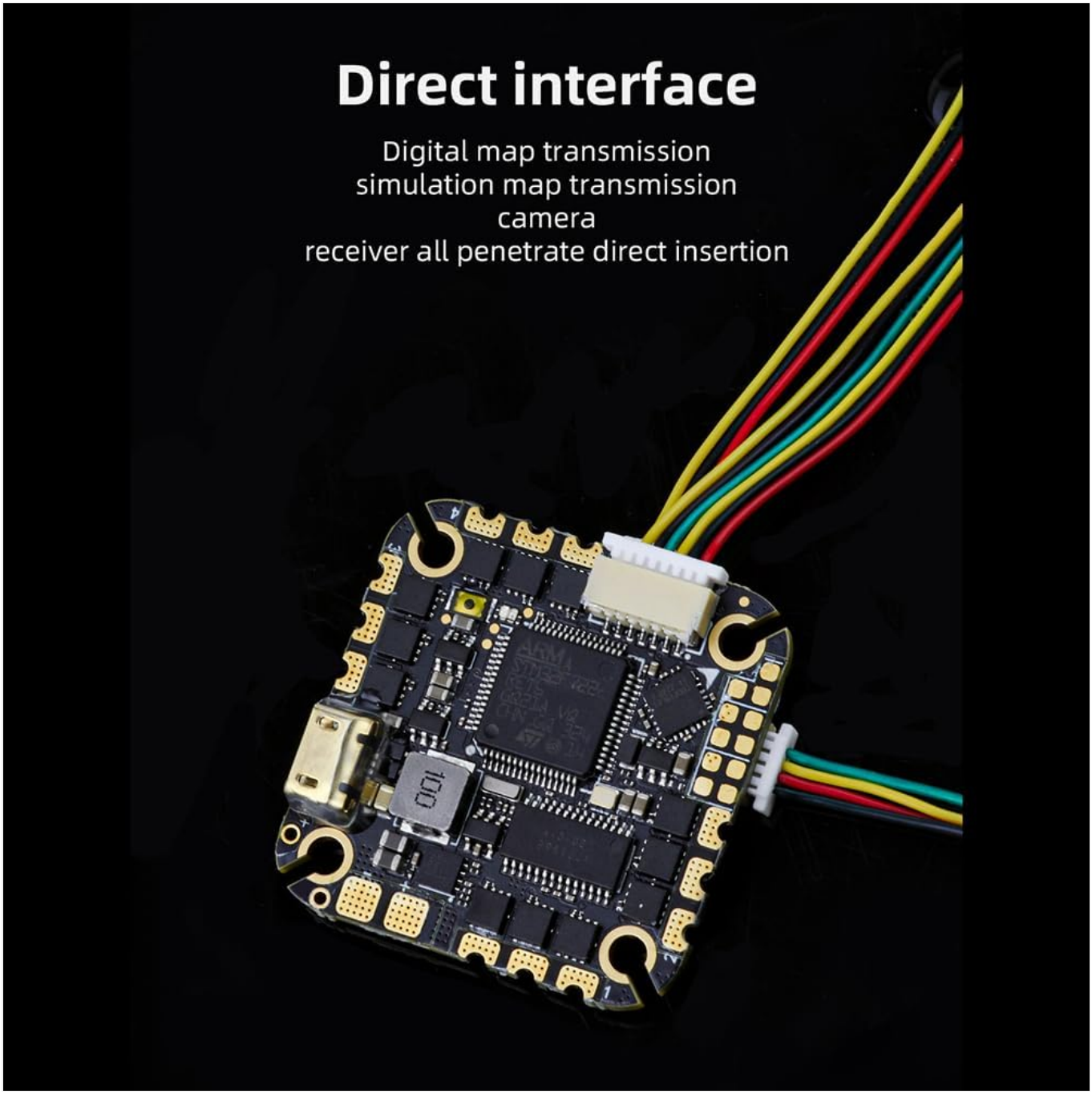

Image: The AIO board showcasing its direct plug interfaces for digital and analog video transmission, camera, and receiver connections.

3. Technical Specifications

Parameter	Value
Product Name	SPECTER 40A 4-6S AIO
MCU	STM32F722
MPU	MPU6000
BEC	5V2A
OSD	Support
LED	Support

Parameter	Value
Buzzer	Support
Continuous Current	40A
Peak Current	50A (10S)
ESC Protocol	DSHOT600, Oneshot, Multishot
Flight Control Firmware	HGLRCF722AIO
ESC Firmware	BLS (brushing Bluejay 96K)
Input Voltage	4-6S 14.8V-22.2V (LiPo)
Dimensions	34x34mm
Install Holes	25.5x25.5mm, M2
Weight	9.8g

4. What's in the Box

The HGLRC Specter 40A 4-6S AIO package includes the following components:

- 1x Specter 40A 4-6S AIO Flight Controller
- 1x XT60 16AWG 100MM Power Cable (Gongtou)
- 1x 30AWG Camera Head Line (60mm, single head SH1.0-3P/single head SH1.25-3P)
- 1x 30AWG Receiver Line (70mm, double head SH1.0-4P)
- 1x 30AWG HD Map Passing Line (70mm, single head SH1.0-7P/single head SH1.0-6p)
- 1x 30AWG Simulation Map Passing Line (70mm, single head GH1.25-6P/single SH1.0-7P)
- 4x M2*6.6 Shock Reduction Columns
- 4x M2*12 Black Nickel Screws
- 4x Self-lock M2 Nuts

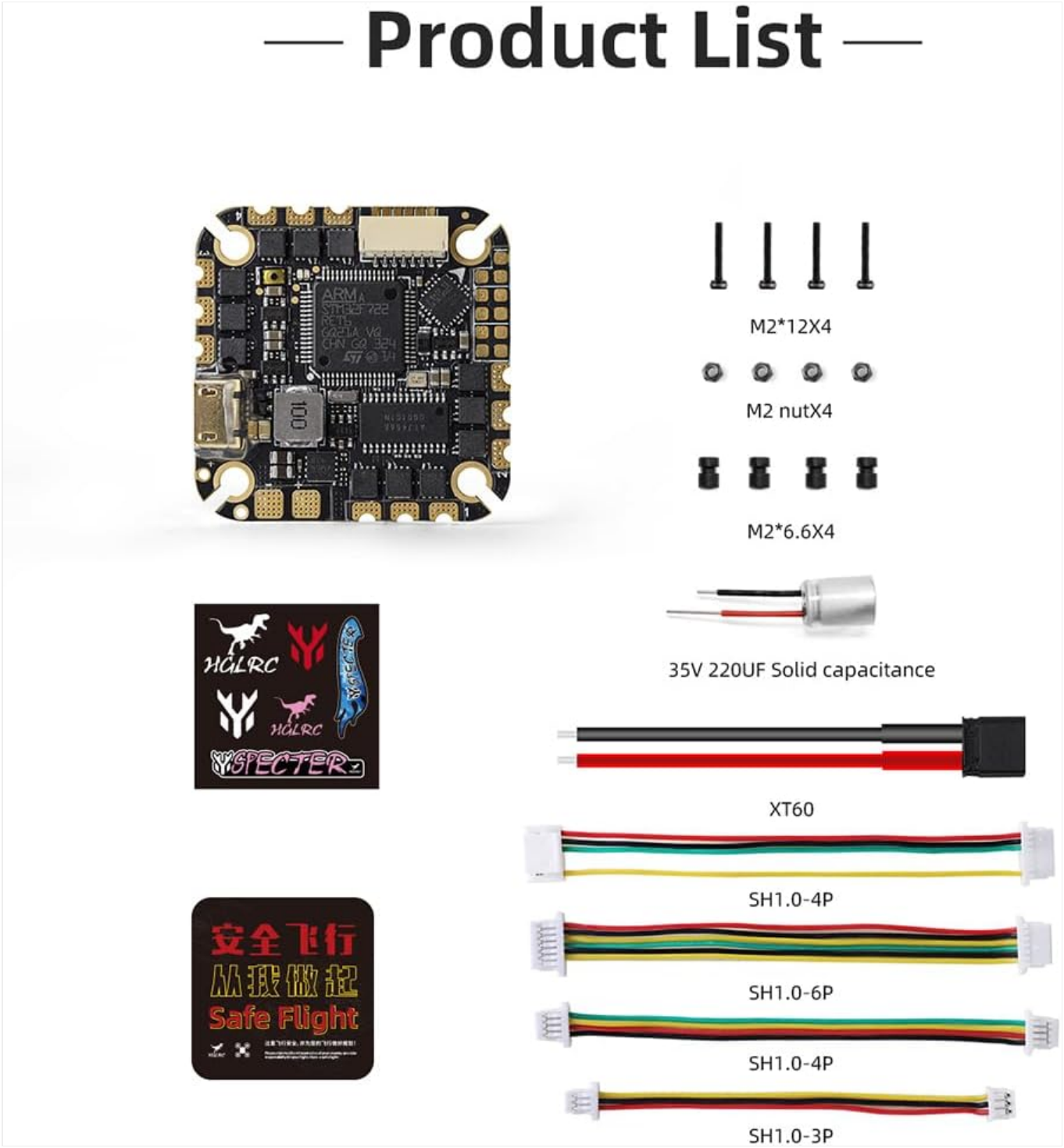

Image: A visual representation of all components included in the Specter 40A 4-6S AIO package.

5. Setup and Installation

Proper installation is crucial for the optimal performance and safety of your FPV drone. Follow the wiring diagram carefully.

5.1 Wiring Diagram

Refer to the diagram below for connecting the AIO board to your drone's components, including power, camera, receiver, and video transmitter.

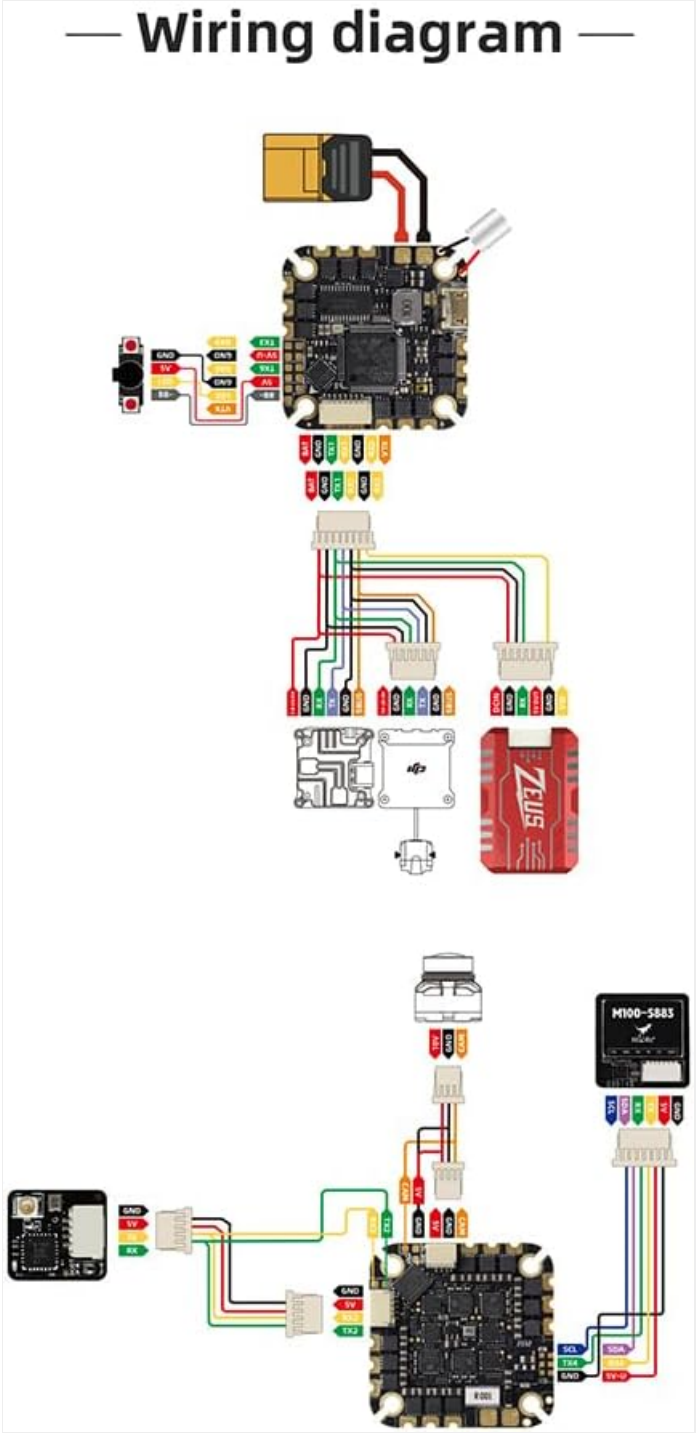

Image: Comprehensive wiring diagram illustrating connections for the HGLRC Specter 40A AIO, including power, camera, receiver, and other peripherals.

5.2 Mounting

Use the provided M2*6.6 shock reduction columns, M2*12 screws, and M2 nuts to securely mount the AIO board to your drone frame. Ensure proper isolation from vibrations.

5.3 Initial Configuration

After physical installation, connect the AIO board to your computer via USB. Use Betaflight Configurator (or similar flight control software) to perform initial setup, calibrate sensors, configure modes, and verify motor direction. The flight control firmware is HGLRCF722AIO and the ESC firmware is BLS (brushing Bluejay 96K).

6. Operating Instructions

6.1 Firmware Management

The board comes pre-flashed with BL firmware. For enhanced flight efficiency, you may flash Bluejay firmware. Always back up your configuration before flashing new firmware. Refer to the official Betaflight and Bluejay documentation for detailed flashing procedures.

6.2 GPS Functionality

If a GPS module is connected, ensure it is properly configured in your flight control software. This enables GPS positioning mode and features like "one key to return" (if supported by your drone's overall setup).

6.3 OSD and LED Configuration

The AIO supports On-Screen Display (OSD) and LED functionality. Configure OSD elements (e.g., battery voltage, flight time) and LED patterns through the flight control software to customize your drone's visual feedback.

7. Maintenance

- **Regular Inspection:** Periodically inspect all solder joints and connections for signs of wear or damage.
- **Cleaning:** Keep the board free from dust, dirt, and debris. Use a soft brush or compressed air for cleaning. Avoid using liquids directly on the board.
- **Water Exposure:** While the board features a waterproof coating, it is not fully submersible. Avoid prolonged exposure to water and ensure it is completely dry before powering on after any contact with moisture.
- **Storage:** Store the AIO board in a dry, cool environment away from direct sunlight and extreme temperatures.

8. Troubleshooting

- **No Power:**
  - Check battery connection and polarity.
  - Verify power cable integrity (XT60).
  - Inspect for any short circuits on the board or connected components.
- **Motors Not Spinning/Incorrectly:**
  - Ensure ESC calibration is correct.
  - Verify motor direction in flight control software.
  - Check motor and ESC connections.
  - Confirm DSHOT600, Oneshot, or Multishot protocol is correctly set.
- **No Video Signal:**
  - Check camera and video transmitter connections to the AIO's direct plug interface.
  - Verify OSD settings in flight control software.
  - Ensure correct video system (PAL/NTSC) is selected.
- **Unstable Flight:**
  - Recalibrate gyroscope and accelerometer.
  - Check for loose components or vibrations affecting the board.
  - Review PID tuning settings in flight control software.
  - Ensure the board is securely mounted with shock reduction columns.
- **Connection Issues (USB):**
  - Try a different USB cable and port.

- Ensure correct drivers are installed on your computer.
- Restart your computer and flight control software.

9. Warranty and Support

For warranty information and technical support, please refer to the official HGLRC website or contact their customer service directly. Keep your purchase receipt as proof of purchase.
HGLRC Official Website: www.hglrc.com

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