

hobbyant Model A + PM02

hobbyant Pixhawk 6C Mini Flight Controller User Manual

Model: A + PM02

1. INTRODUCTION

The hobbyant Pixhawk 6C Mini is an advanced flight controller designed for Unmanned Aerial Vehicles (UAVs), Vertical Take-Off and Landing (VTOL) aircraft, and various DIY RC projects. It is based on the Pixhawk FMUv6C Open Standard and Connector Standard, featuring a powerful STM32H743 microprocessor. This Mini version integrates a built-in PWM header and has a compact form factor, making it suitable for applications where space is limited.

2. KEY FEATURES

- **High-Performance Processor:** Equipped with an STM32H743 processor (32-bit ARM Cortex-M7, 480MHz, 2MB memory, 1MB SRAM) for superior computing power and faster response times.
- **Redundant IMUs & Sensor Fusion:** Features dual IMUs (ICM-42688-P & BMI055), an IST8310 magnetometer, and an MS5611 barometer for precise navigation, enhanced stability, and reliability in flight.
- **Compact Form Factor:** A smaller version of the Pixhawk 6C, ideal for space-constrained drone builds and racing drones, with an integrated PWM header.
- **Integrated Vibration Isolation:** Designed to filter out high-frequency vibrations and reduce noise, ensuring accurate sensor readings.
- **Temperature-Controlled IMUs:** Onboard heating resistors maintain optimal operating temperature for the IMUs, improving performance consistency.
- **Firmware Compatibility:** Fully supported by PX4 (version 1.14 and newer) and ArduPilot (version 4.3 and newer) firmware.
- **Hardware Switchable PWM:** Supports hardware-switchable 3.3V or 5V PWM signal mode (requires opening the casing for adjustment).

3. TECHNICAL SPECIFICATIONS

3.1. Processors & Sensors

FMU Processor	STM32H743 (32-bit Arm® Cortex®-M7, 480MHz, 2MB memory, 1MB SRAM)
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IO Processor	STM32F103 (32-bit Arm® Cortex®-M3, 72MHz, 64KB SRAM)
Accelerometer/Gyroscope 1	ICM-42688-P
Accelerometer/Gyroscope 2	BMI055
Magnetometer	IST8310
Barometer	MS5611

3.2. Electrical Data

Max Input Voltage	6V
USB Power Input	4.75V ~ 5.25V
Servo Rail Input	0V ~ 36V
Telem1 & GPS2 Combined Current Limit	1.5A
All Other Ports Combined Current Limit	1.5A
Operating Temperature	-40°C ~ 85°C

3.3. Mechanical Data (Model A)

Dimensions	53.3 x 39 x 16.2 mm
Weight	39.2g

Note: The specifications provided are for Model A. Other models (e.g., Model B) may have different mechanical dimensions and weight.

4. PACKAGE CONTENTS

The standard package for the hobbyant Pixhawk 6C Mini (Model A + PM02) includes:

- 1 x hobbyant Pixhawk 6C Mini Flight Controller
- 1 x PM02 Power Module
- Other parts as specified by your chosen configuration.



Figure 1: Pixhawk 6C Mini Flight Controller. This image displays the top surface of the flight controller, highlighting its various connection ports and PWM outputs.



Figure 2: PM02 Power Module. This image shows the power module with its XT60 battery connectors and the output cable for connecting to the flight controller.

5. SETUP AND INSTALLATION

Proper setup is crucial for the safe and reliable operation of your Pixhawk 6C Mini. This section provides a general overview of the installation process. For detailed, up-to-date instructions, always refer to the official PX4 or ArduPilot documentation for your specific firmware version.

5.1. Physical Installation

1. **Mounting:** Securely mount the Pixhawk 6C Mini to your airframe using vibration-damping pads. Ensure the arrow on the flight controller points towards the front of the vehicle.
2. **Power Module Connection:** Connect the PM02 power module to the flight controller's power input port. Ensure correct polarity. The PM02 provides regulated power to the flight controller and measures battery voltage and current.
3. **Peripheral Connections:** Connect GPS, telemetry radios, ESCs (Electronic Speed Controllers), servos, and other peripherals to their respective ports as indicated in the pinout diagram (refer to Figure 1 for port labels).
4. **PWM Output:** Connect your ESCs or servos to the I/O PWM OUT and FMU PWM OUT ports. Note that the PWM signal mode (3.3V or 5V) is hardware switchable, which may require opening the casing.

5.2. Firmware Flashing

The Pixhawk 6C Mini supports both PX4 and ArduPilot firmware.

- **PX4 Firmware:** Use [QGroundControl](#) to flash the latest stable PX4 firmware.
- **ArduPilot Firmware:** Use [Mission Planner](#) or QGroundControl to flash the latest stable ArduPilot firmware.

Note: M10 GPS modules require PX4 1.14 & ArduPilot 4.3 or newer firmware versions for compatibility.

5.3. Initial Configuration

After flashing the firmware, perform the initial calibration and configuration steps using your chosen ground control station software (QGroundControl for PX4, Mission Planner for ArduPilot). This typically includes:

- Sensor calibration (accelerometer, gyroscope, compass, barometer).
- Radio calibration.
- ESC calibration.
- Flight mode setup.
- Failsafe configuration.

6. OPERATION

Once the Pixhawk 6C Mini is installed and configured, you can proceed with flight operations. Always ensure pre-flight checks are completed before each flight.

1. **Pre-Flight Checks:** Verify battery levels, GPS lock (if applicable), radio communication, and sensor health.
2. **Arming:** Arm the flight controller using the configured arming sequence (e.g., stick commands or ground station command). The status LED will indicate arming status.
3. **Takeoff:** Perform a controlled takeoff. For autonomous flights, initiate the mission from the ground control station.
4. **Monitoring:** Continuously monitor vehicle status, battery voltage, and GPS signal through your ground control station during flight.
5. **Landing:** Execute a controlled landing. Disarm the flight controller after landing.

For detailed operational procedures, refer to the comprehensive documentation provided by the PX4 or ArduPilot communities.

7. MAINTENANCE

Regular maintenance ensures the longevity and reliable performance of your Pixhawk 6C Mini.

- **Firmware Updates:** Periodically check for and install the latest stable firmware versions for PX4 or ArduPilot to benefit from bug fixes and new features.
- **Physical Inspection:** Regularly inspect the flight controller and its connections for any signs of damage, loose wires, or corrosion.
- **Environmental Protection:** Protect the flight controller from dust, moisture, and extreme temperatures. Consider using a protective enclosure if operating in harsh environments.
- **Recalibration:** Recalibrate sensors (especially the compass) if you notice unusual flight behavior or after significant changes to your vehicle's setup or location.

8. TROUBLESHOOTING

This section addresses common issues you might encounter. For more in-depth troubleshooting, consult the official PX4 or ArduPilot documentation and community forums.

Problem	Possible Cause	Solution
Flight Controller Not Powering On	Incorrect power connection, faulty power module, or damaged USB cable.	Verify power module connections and polarity. Test with a different USB cable or power source. Check for visible damage.
No GPS Lock	GPS module not connected, obstructed view of sky, or interference.	Ensure GPS module is correctly connected. Operate in an open area with clear sky view. Check for nearby electronic interference. Verify GPS firmware compatibility (e.g., M10 GPS requires PX4 1.14+ / ArduPilot 4.3+).
Unstable Flight / Drifting	Improper sensor calibration, excessive vibrations, or incorrect PID tuning.	Perform full sensor calibration. Ensure flight controller is mounted on vibration-damping pads. Review PID tuning parameters.
Cannot Arm Flight Controller	Failsafe triggered, pre-arm checks failed (e.g., no GPS lock, low battery), or incorrect arming sequence.	Check ground control station for pre-arm warnings. Address any reported issues. Ensure correct arming stick commands or ground station procedure.

9. WARRANTY AND SUPPORT

Information regarding specific warranty terms for the hobbyant Pixhawk 6C Mini Flight Controller is not provided in the product details. Please refer to the retailer or manufacturer's official website for warranty details and support contact information. For technical support related to PX4 or ArduPilot firmware, please consult their respective official documentation and community forums:

- [PX4 Official Documentation](#)
- [ArduPilot Official Documentation](#)

10. PRODUCT VIDEOS

No official product videos from the seller were found in the provided data. For visual guides and tutorials, please refer to the extensive community resources available for Pixhawk, PX4, and ArduPilot platforms.

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