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› JHEMCU F745 NOXE BL32A60 Mini Stack 3-6S Flight Controller and 60A 4-in-1 ESC User Manual

JHEMCU F745 NOXE BL32A60 Mini Stack

JHEMCU F745 NOXE BL32A60 Mini Stack User Manual

Flight Controller and 4-in-1 ESC for FPV Drones

1. INTRODUCTION

The JHEMCU F745 NOXE BL32A60 Mini Stack is an integrated flight control system designed for FPV (First Person View) racing and freestyle drones. This unit combines a high-performance F745 NOXE Flight Controller with a 60A BLHELI_32 4-in-1 Electronic Speed Controller (ESC). It is engineered to provide precise control and efficient power delivery for 3-6S battery configurations, enhancing drone performance and reliability.

Key features include an STM32F745 master processor, MPU6000 gyroscope, DPS310 barometer, and AT7456E OSD chip on the flight controller. The ESC supports continuous current up to 60A per channel and utilizes BLHELI_32 firmware. The compact 20x20mm mounting pattern makes it suitable for various drone frame sizes.

2. PACKAGE CONTENTS

Verify that all components are present in your package:

- 1x JHEMCU F745 NOXE Flight Controller
- 1x JHEMCU 60A ESC
- 1x 470UF/35V Solid Capacitor
- 8x M6*8 Yellow Shock Absorbing Balls
- 4x M6*4 Blue Shock Absorbing Balls
- 8x M6 Nylon Hex Nuts
- 4x M3*20MM Screws
- 1x XT60 Connector
- 1x 8p Double-Ended Cable
- 2x 14AWG 60A/16AWG 45A Wires

3. SETUP AND INSTALLATION

3.1 Component Overview

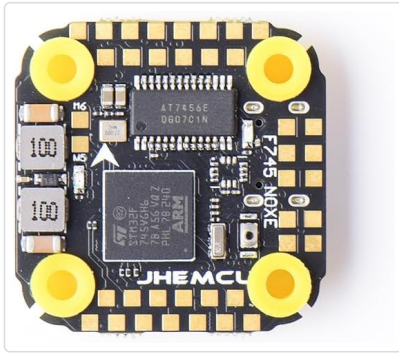


Figure 1: Top view of the JHEMCU F745 NOXE Flight Controller. This image displays the main components of the flight controller board, including the STM32F745 master chip, MPU6000 gyroscope, and AT7456E OSD chip, along with various solder pads and mounting holes.

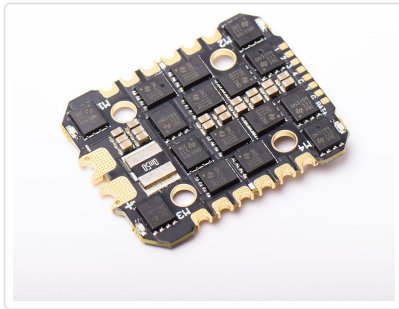


Figure 2: Top view of the JHEMCU 60A 4-in-1 ESC board. This image shows the layout of the Electronic Speed Controller, highlighting the MOSFETs, capacitors, and solder pads for motor and power connections.

3.2 Mounting the Stack

The flight controller and ESC are designed to be mounted as a stack. The mounting hole spacing is 20x20mm with 4mm diameter holes. Use the provided shock-absorbing balls and screws for installation to minimize vibrations transmitted to the flight controller's gyroscope.

1. Place the 60A ESC on the drone frame's mounting posts, securing it with the appropriate shock-absorbing balls.
2. Connect the 8p double-ended cable between the ESC and the flight controller.
3. Mount the F745 NOXE Flight Controller on top of the ESC, using the remaining shock-absorbing balls and screws. Ensure proper orientation as indicated by markings on the boards.

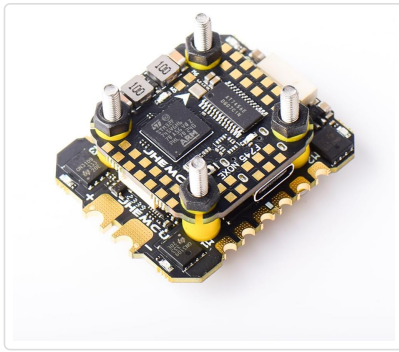


Figure 3: Assembled JHEMCU F745 NOXE BL32A60 Mini Stack. This image shows the flight controller and ESC boards stacked together, secured with the yellow shock-absorbing balls and screws, ready for installation into a drone frame.

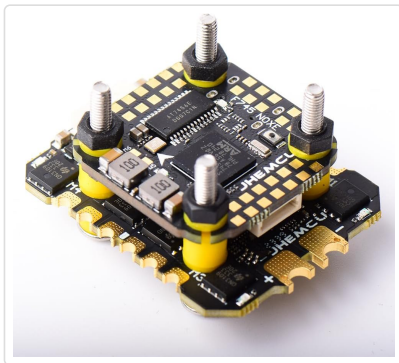


Figure 4: Side view of the JHEMCU F745 NOXE BL32A60 Mini Stack. This perspective highlights the compact nature of the stacked boards and the connection points between the flight controller and ESC.

3.3 Wiring Connections

Carefully solder all necessary connections. Refer to the wiring diagram specific to your drone frame and peripheral components. Common connections include:

- **Power Input:** Solder the XT60 connector to the main battery pads on the ESC. Ensure correct polarity.
- **Motors:** Solder motor wires to the designated pads on the ESC (M1-M4).
- **Receiver:** Connect your receiver (ELRS, TBS, SBUS, IBUS, DSM2, DSMX) to the appropriate UART port on the flight controller.
- **FPV Camera & VTX:** Connect your FPV camera and video transmitter to the designated pads for video input/output and power. The FC supports HD O3.
- **GPS & Compass:** If using, connect GPS and compass modules to their respective UARTs.
- **Buzzer & LED:** Connect external buzzer and LED strips if desired.

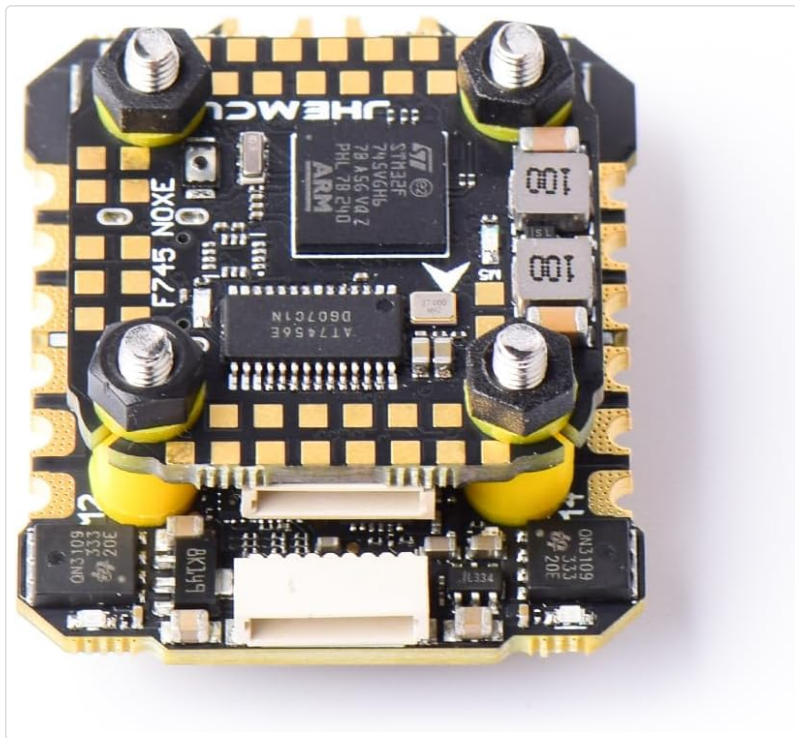


Figure 5: Bottom view of the JHEMCU F745 NOXE Flight Controller. This image illustrates the various solder pads and connectors on the underside of the flight controller, including those for receiver, GPS, and other peripherals.

4. OPERATING INSTRUCTIONS

4.1 Firmware Flashing and Configuration

The JHEMCU F745 NOXE Flight Controller comes pre-flashed with Betaflight firmware (Betaflight_4.4.2_JHEF745.HEX). The 60A ESC uses BLHELI_32 firmware (JHEMCU_ESC32_Multiti_32_9.HEX).

1. **Connect to PC:** Use a USB Type-C cable to connect the flight controller to your computer.
2. **Betaflight Configurator:** Download and install the latest Betaflight Configurator software. This tool allows you to configure flight controller settings, calibrate sensors, set up modes, and flash new firmware.
3. **BLHeliSuite32:** For ESC configuration and firmware updates, use BLHeliSuite32. This software allows you to change motor direction, adjust ESC settings, and update BLHeli_32 firmware.
4. **Initial Setup:** Follow the Betaflight setup wizard for initial calibration of the accelerometer and gyroscope. Configure your receiver, motor protocols (Dshot150, Dshot300, Dshot600 are supported), and flight modes.
5. **OSD Configuration:** Customize the On-Screen Display (OSD) to show relevant flight data such as battery voltage, current, flight time, and warnings.

4.2 Pre-Flight Checks

Before each flight, perform the following checks:

- Ensure all connections are secure and solder joints are intact.
- Verify propeller direction and tightness.
- Check battery voltage and ensure it is fully charged.
- Confirm receiver functionality and control surface response.
- Arm the drone in a safe environment and check motor spin direction.

5. MAINTENANCE

Regular maintenance ensures the longevity and optimal performance of your JHEMCU F745 NOXE BL32A60 Mini Stack.

- **Cleaning:** Keep the flight controller and ESC free from dust, dirt, and moisture. Use compressed air or a soft brush for cleaning. Avoid using liquids directly on the electronics.
- **Inspection:** Periodically inspect all solder joints for cracks or cold joints. Check for any signs of physical damage to the components or PCB.
- **Firmware Updates:** Regularly check for new firmware releases for both Betaflight (FC) and BLHeli_32 (ESC). Updating firmware can provide performance improvements, new features, and bug fixes.
- **Storage:** When not in use, store the drone or components in a dry, cool environment away from direct sunlight and extreme temperatures.

6. TROUBLESHOOTING

This section addresses common issues you might encounter. For more detailed diagnostics, consult online FPV communities or the Betaflight/BLHeli_32 documentation.

- **No Power to FC/ESC:**
 - Check main battery connection and XT60 connector for secure fit and correct polarity.
 - Inspect solder joints on the main power pads of the ESC.
 - Verify the 8p cable connection between FC and ESC.
- **Motors Not Spinning/Incorrect Direction:**
 - Ensure motors are correctly connected to M1-M4 pads on the ESC.
 - Calibrate ESCs using BLHeliSuite32.
 - Check motor direction in BLHeliSuite32 and adjust if necessary.
 - Verify motor protocol (Dshot) is correctly configured in Betaflight.
- **No Receiver Signal:**
 - Confirm receiver is properly wired to the correct UART on the FC.
 - Ensure receiver is bound to your radio transmitter.
 - Verify the correct receiver protocol (e.g., CRSF, SBUS) is selected in Betaflight.
- **USB Connection Issues:**
 - Install necessary DFU drivers for STM32 microcontrollers.
 - Try a different USB cable or port.
 - Ensure Betaflight Configurator is up to date.
- **Unstable Flight:**
 - Check for loose mounting or excessive vibrations; ensure shock-absorbing balls are correctly installed.
 - Recalibrate accelerometer and gyroscope in Betaflight.
 - Review PID tuning settings.

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7. SPECIFICATIONS

7.1 F745 NOXE Flight Controller Specifications

Feature	Specification
Master	STM32F745
Gyroscope	MPU6000
Barometer	DPS310
OSD Chip	AT7456E
Black Box	16MB
LED Programming	Support
Buzzer	Support
Input Voltage	3-6S
BEC 1	5V/2.5A
BEC 2	10V/2.0A
Camera Input	Support
USART Ports	UART1, UART2, UART3, UART4, UART5, UART6
Receiver Support	ELRS (CRSF), TBS (CRSF), SBUS, IBUS, DSM2, DSMX
GPS Support	Yes
Compass Support	Yes
HD O3 Support	Yes
ESC Signal	Dshot150, Dshot300, Dshot600
USB Port	TYPE-C
Current Port	Yes
Voltage Sensor	Yes
DFU Button	Yes
Firmware	Betaflight_4.4.2_JHEF745.HEX
Mounting Hole Spacing	20*20mm*4mm
Maximum External Size	29mm*29mm
Weight	4.8 grams

7.2 4-in-1 ESC Specifications

Feature	Specification
Input Voltage	3-6S (11-27V)
Continuous Current	60A x 4 Channels
BEC	No
Ammeter	Yes
Mounting Hole Pitch	20mm/M4
Overall Dimension	42.8mm*34mm
Firmware	BLHELI_32 JHEMCU_ESC32_Multiti_32_9.HEX
Weight	11 grams

8. WARRANTY AND SUPPORT

This product is backed by several guarantees to ensure customer satisfaction:

- **DOA Guarantee:** Dead on Arrival guarantee.
- **Missing/Wrong Items Guarantee:** Ensures you receive all correct components.
- **Quality Guarantee:** Assurance of product quality.
- **No Reason Returns:** Allows for returns without specific justification.

For technical support, warranty claims, or further assistance, please contact the seller or refer to the official JHEMCU website for detailed resources and contact information.