

Upon opening your SoloGood H743-WING V3 Flight Controller package, you should find the following components:

- 1x H743-WING V3 Flight Controller Board
- 1x USB (Type-C)/Beep (Passive buzzer) Extender
- 1x 20cm JST-SH-6P to JST-SH-6P cable for USB extender
- 2x 20cm JST-GH-4P to JST-GH-4P cables for CAN & I2C port
- 1x Rubycon ZLH 35V 470uF capacitor
- Dupont 2.54 pins (Board is shipped unsoldered)

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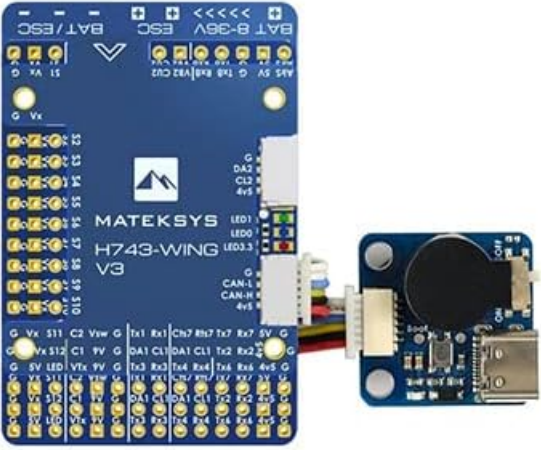
Video: An overview of the components included with the Matek H743-WING V2 FC (similar to V3) Flight Controller, showing the main board, cables, and accessories.

3. TECHNICAL SPECIFICATIONS

The H743-WING V3 Flight Controller boasts the following technical specifications:

Component	Specification
MCU	STM32H743VIT6, 480MHz, 1MB RAM, 2MB Flash
IMU	MPU6000 (SPI1) & ICM42605 (SPI4)
Barometer	Infineon DPS310 (I2C2)
OSD	AT7456E (SPI2)
Blackbox	MicroSD card slot (SDIO)
UARTs	7x Uarts (1,2,3,4,6,7,8) with built-in inversion
PWM Outputs	13x (including "LED" pad)
I2C Ports	2x
CAN Port	1x
ADC Inputs	6x (VBAT, Current, RSSI, Analog AirSpeed, VB2, CU2)
LEDs	3x for FC STATUS (Blue, Red) and 3.3V indicator (Red)
SPI Breakout	1x SPI3
USB/Beep Extender	Type-C (USB2.0)
Camera Inputs	Dual Camera Inputs switch
Camera/VTX Power	5V/9V(12V) switchable
Current Sense	High-precision (90A continuous, 220A peak)
Battery Voltage Sensor	1K:10K (Scale 1100 in INAV, BATT_VOLT_MULT 11.0 in ArduPilot)
ADC VB2 Voltage Divider	1K:20K
ADC AirSpeed Voltage Divider	20K:20K
Static Power	160mA@5V
FC Firmware	ArduPilot(ChiBiOS): MATEKH743; INAV: MATEKH743

Mounting	30.5 x 30.5mm, Φ 4mm with Grommets Φ 3mm
Dimensions	54 x 36 x 13 mm
Weight	30g with USB extender

MATEKSYS Flight Controller H743-WING V3

- * STM32H743VIT6, 480 MHz, 2MB Flash
- * ICM42688-P(SPI1) & ICM42605(SPI4)
- * OSD(SPI2)
- * DPS310 (I2C2)
- * MicroSD BlackBox (SDIO)
- * 7x UARTs, 2x I2C, 1x CAN, 1x SPI3 breakout
- * 6x ADC (Vbat, Current, VB2, CU2, RSSI, AirSpeed)
- * 13x PWM outputs
- * Switchable dual camera inputs
- * Switchable 5V/9V(12V) outputs
- * 8-36V DC IN (3-8S LiPo)
- * High-precision current sense (90A continuous, 220A peak)
- * BEC 5V 2A cont. 3A peak for FC
- * BEC 9V 2A cont. 3A peak 12V option for Camera/VTX
- * BEC Vx 8A cont. 10A peak for servos
Vx= 5V Default, 6V or 7.2V option
- * LDO 3.3V 200mA cont.

*** ArduPilot MATEKH743
*** INAV MATEKH743

Image: A visual representation of the H743-WING V3 Flight Controller with its key specifications highlighted.

4. SETUP AND INSTALLATION

Proper installation is crucial for the optimal performance of your H743-WING V3 Flight Controller. Please follow these guidelines carefully:

4.1. Physical Mounting

The flight controller is designed for 30.5 x 30.5mm mounting patterns. Use the provided grommets to ensure proper vibration isolation and secure fitting. The board dimensions are 54 x 36 x 13 mm.

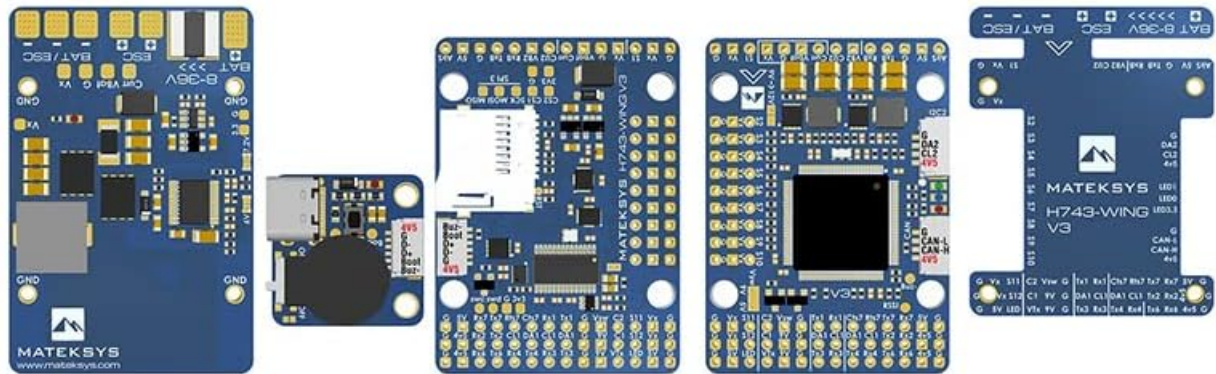
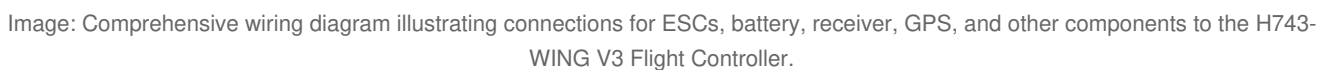


Image: Various angles of the H743-WING V3 Flight Controller, showing its compact design and connection points.

4.2. Wiring Diagram

Refer to the detailed wiring diagrams for connecting your ESCs, motors, receivers, GPS, VTX, camera, and other peripherals. Ensure all connections are secure and correctly polarized to prevent damage.

INAV fw: MATEKH743
ArduPilot fw: MATEKH743



LAYOUT

```
Vbat: 8-36V DC IN
      Voltage divider 1K:10K, Max.36V supported
      BATT_VOLT_PIN 10, BATT_VOLT_MULT 11
Curr: for current sensor, 0-3.3V
      BATT_CURR_PIN 11, BATT_AMP_PERVLT 66.7
      INA_V current scale: 150
```

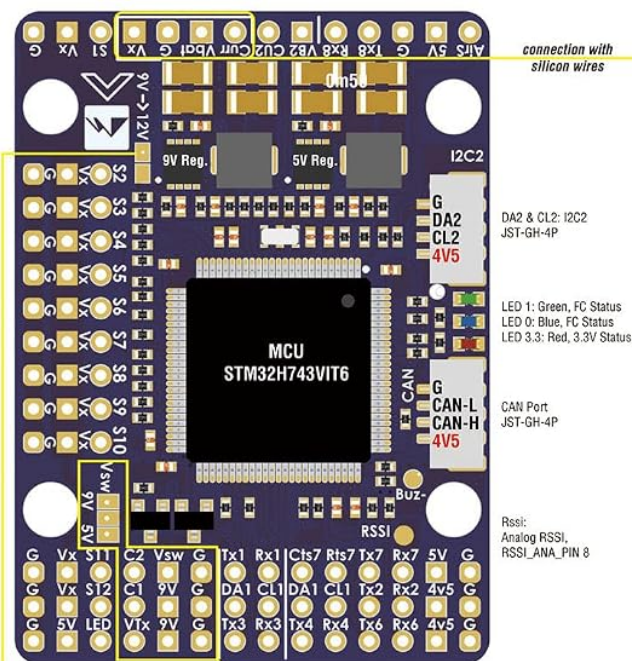
VB2: Voltage divider 1K/20K, Max.69V supported	AirS: Analog Airspeed sensor (0-6.6V)
BATT2_VOLT_PIN 18, BATT2_VOLT_MULT 21	1: 1 voltage divider built-in
CU2: for external current sensor, 0-3.3V	ARSPD_PIN 4
BATT2_CURR_PIN 7	

TX8/RX8: UART8

AirS: Analog Airspeed sensor (0-6.6V)
1: 1 voltage divider built-in
ARSPD_PIN 4

+ & - : Battery & ESC power pads, 8~36V DC(3~8S LIPO).

Current Sensor: 90A continuous, 220A peak.
INAV Current sensor scale: 150



S1-S12, LED: PWM1~PWM13

Vx: BEC 5V/6V/7.2V for servos, Default is 5V
8A cont. 10A peak
5V: onboard BEC 5V 2A cont. 3A peak
9V: onboard BEC 9V 2A cont. 3A peak,
*** 9V rise to 12V if "9V->12V" jumper is bridged.
G: Ground

9V → 12V 

TX1/RX1: UART1
TX7/RX7: UART7
CTS7/Rts7: Uart7_CTS/RTS for ArduPilot Telem

TX2/RX2: UART2
DA1 & CL1: I2C1

TX3/RX3: UART3, TX4/RX4: UART4

RX6: UART6-RX for Serial_RX by default
 PPM share RX6 pad
 TX6: UART6-TX

4V5: 4.4-4.8V, Max.500mA

*** the voltage is also supplied when connecting via USB

A battery must be plugged in for power to be provided to the pins marked "5V" on the board.



Vsw: 5V/9V selection

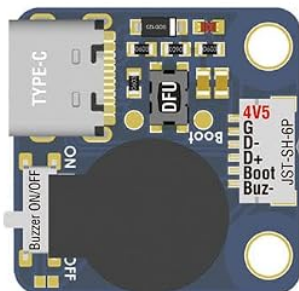
*** ON/OFF can be switched via ArduPilot Relay or Modes/USER1 (INAV)
 *** Max. 1.5A load on this pad. (Default ON)
 *** Vsw jumper one or the other must be bridged

C1: Camera-1 video IN (Default)

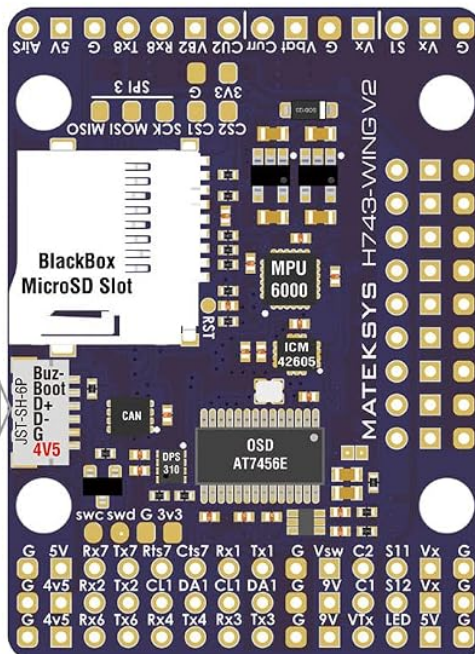
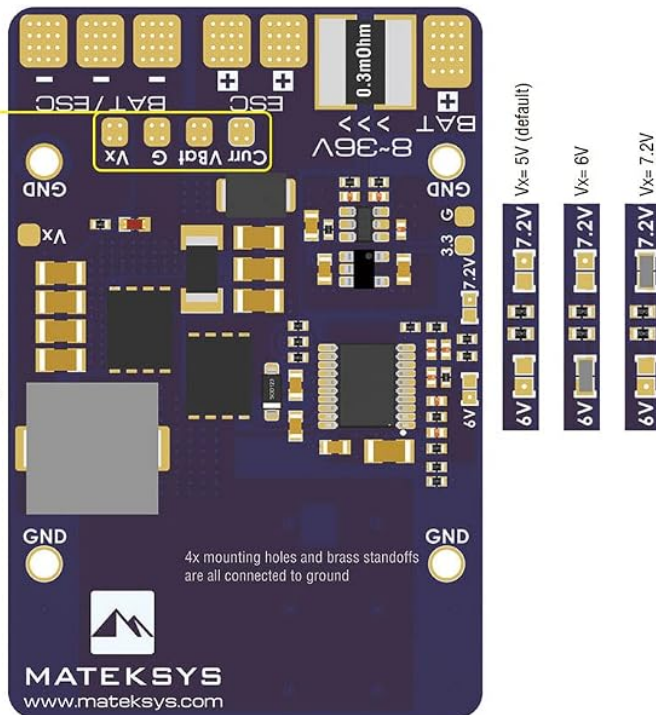
C2: Camera-2 video IN
111 01/08 can be exit

*** C1/C2 can be switched via ArduPilot Relay or Modes/USER2 (INAV)

VTX: Video OUT for Video Transmitter



DFU Button: DFU mode
Connect USB to the PC While holding the boot button in.



Size: 54x36x13mm
Weight: 30g w/ top and bottom plate & USB extender
Holes: Φ 4mm, 30.5mm mounting
M3 Silicon Grommets included

Image: Detailed layout diagram of the H743-WING V3 Flight Controller, indicating pin assignments, component locations, and power distribution.

4.3. Power Supply

The FC supports an input voltage range of 8~36V (3~8S LiPo) with TVS protection. Ensure your power source is

stable and within this range. The BEC Vx output is designed for servos, adjustable to 5V (default), 6V, or 7.2V via jumper, with a continuous current of 8 Amps (10A Peak).

5. FIRMWARE AND CONFIGURATION

The H743-WING V3 Flight Controller supports both ArduPilot and INAV firmware. It is crucial to use the correct firmware version for your specific V3 board.

5.1. Firmware Versions

The V3 (Blue PCB) version uses ICM42688-P (1st) and ICM42605 (2nd) IMUs. For ArduPilot, use "plane 4.2.0 or newer" firmware. For INAV, use INAV 5.0 or newer. Older INAV versions like INAV4.1 are not supported for the V3. Always download firmware from the official Matek website.



Tips & Notes

H743-WING	ArduPilot		INAV	
V1 Blue PCB	ICM20602(1st) MPU6000(2nd)	ArduPilot 4.0 stable or newer	MPU6000 (0) default ICM20602 (1)	INAV 3.0 or newer
V2 Purple PCB	ICM42605(1st) MPU6000(2nd)	ArduPilot 4.1 stable or newer	MPU6000 (0) default ICM42605 (2)	INAV 4.0 or newer
V3 Blue PCB	ICM42688P(1st) ICM42605(2nd)	ArduPilot plane 4.2.0 stable or newer	ICM42688P (0) default ICM42605 (2)	INAV 5.0 or newer

*** V1/V2/V3 share same ArduPilot/INAV Target ***

ArduPilot

Current sensor range is 220A on H743-WING-V2/V3, make sure you set the BATT_AMP_PERVLT to 66.7 with ArduPilot 4.1 or higher, set INS_ENABLE_MASK to 7 or default 127.

Pls download **"plane 4.2.0 or newer"** ArduPilot firmware for H743-WING-V3

It is recommended to use STM32CubeProgrammer to erase MCU and upload firmware. check mateksys official website.

INAV

Current sensor range is 220A on H743-WING-V2/V3, make sure you set the Current Meter Scale to 150

H743-WING-V3 is not supported by INAV4.1 downloaded from configurator. pls download inav_4.1.0_MATEKH743_42688 from Mateks website.

Starting with INAV5.0, they will share the same firmware.

Others

If the ESCs don't have enough capacitors integrated, low ESR electrolytic capacitor is required for reducing ESC noise.

Image: A table detailing compatible IMUs and recommended firmware versions for H743-WING V1, V2, and V3 boards for both ArduPilot and INAV.

5.2. Current Sensor Calibration

For accurate current sensing, calibrate the sensor in your chosen flight controller software:

- **ArduPilot:** Set BATT_AMP_PERVLT to 66.7. Ensure INS_ENABLE_MASK is set to 7 or default 127.
- **INAV:** Set the Current Meter Scale to 150.

5.3. Firmware Upload

It is recommended to use STM32CubeProgrammer to erase the MCU and upload firmware. Connect the USB/Beep Extender to the FC and your computer. Hold the BOOT button on the extender while connecting to enter DFU mode for firmware flashing.

6. MAINTENANCE

To ensure the longevity and reliable operation of your flight controller, consider the following maintenance practices:

- **Regular Inspection:** Periodically check all solder joints and connections for signs of wear, corrosion, or damage.
- **Cleanliness:** Keep the board free from dust, dirt, and moisture. Use compressed air or a soft brush for cleaning. Avoid using liquid cleaners directly on components.
- **Capacitors:** If your ESCs do not have enough integrated capacitors, a low ESR electrolytic capacitor (like the included Rubycon ZLH 35V 470uF) is required to reduce ESC noise and protect the flight controller.
- **Storage:** Store the flight controller in a dry, anti-static environment when not in use.

7. TROUBLESHOOTING

If you encounter issues with your H743-WING V3 Flight Controller, consider these common troubleshooting steps:

- **No Power/No Lights:** Verify battery connection and voltage. Check for short circuits. Ensure the USB extender is properly connected if powering via USB.
- **Connection Issues (PC):** Ensure correct drivers are installed. Try a different USB port or cable. Confirm the FC is in DFU mode if attempting firmware flash.
- **Sensor Malfunction:** Check for physical damage to IMUs or barometer. Ensure firmware is compatible with the V3 board's specific IMU.
- **Unstable Flight:** Review your PID tuning settings in Betaflight/INAV. Check for excessive vibrations and ensure the FC is properly soft-mounted. Verify motor and ESC connections.
- **Current Sensor Inaccuracy:** Re-calibrate the current sensor according to the firmware-specific instructions in Section 5.2.

For persistent issues, consult online forums, community resources, or the official Matek-RC support channels.

8. WARRANTY AND SUPPORT

SoloGood products are manufactured to high standards. For specific warranty information, please refer to the documentation provided with your purchase or contact SoloGood customer support directly. Keep your proof of purchase for any warranty claims.

For technical assistance, firmware updates, and additional resources, please visit the official Matek-RC website or the SoloGood brand store on Amazon:

SoloGood Amazon Store: [Visit Store](#)

