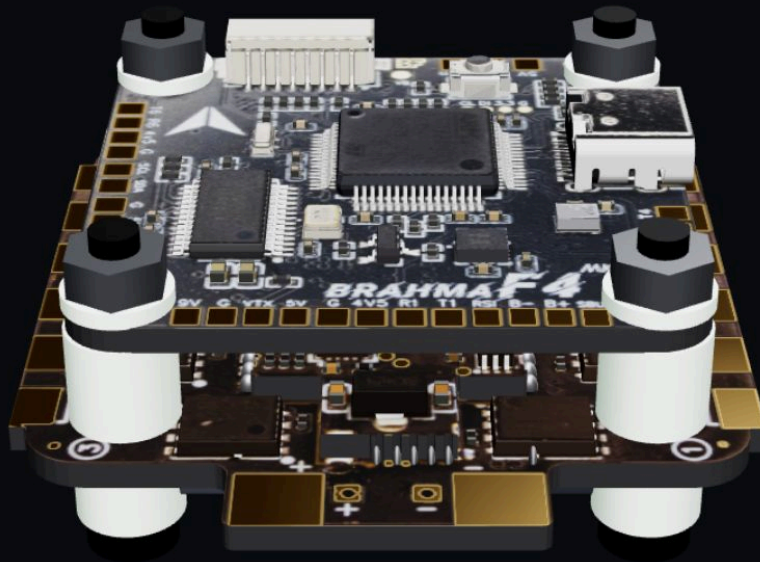


# Stack 460



# Contents

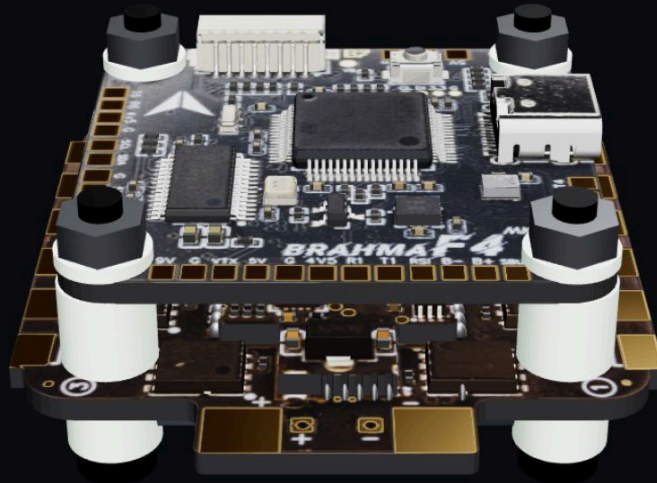
- 01 Stack 460 (Brahma F4 + Vishnu 60)
- 02 Brahma F4 flight controller
- 03 How to flash Betaflight on the Brahma F4
- 04 How to flash INAV on the Brahma F4
- 05 How to flash ArduPilot on the Brahma F4
- 06 Connect a receiver to the Brahma F4
- 07 Connect servos to the Brahma F4
- 08 Connect Herelink to the Brahma F4
- 09 Connect a Raspberry Pi to the Brahma F4
- 10 Vishnu 60 4-in-1 ESC

## Need help?

WhatsApp or call **+91 80171 93277** (Mon–Sat, 12 PM–8 PM) · [info@thedarkmatter.in](mailto:info@thedarkmatter.in) · join the DM Community from [thedarkmatter.in](https://thedarkmatter.in). The docs have this guide with every 3D view live: turn the board, click a step, and the pads light up: [thedarkmatter.in/pages/docs?doc=stack-460](https://thedarkmatter.in/pages/docs?doc=stack-460)

## 01 Stack 460 (Brahma F4 + Vishnu 60)

---



Brahma F4 flight controller on a Vishnu 60 4-in-1 ESC, matched and shipped as one stack on the standard 30.5 × 30.5 mm mount. Drag the stack to turn it.

### Assembly

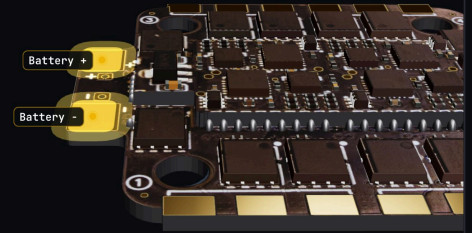
---

#### 1 Grommets and screws

Four M3 × 25 mm screws come up through the frame. A soft grommet goes in every mounting hole of both boards, fat body down, so frame vibration stays out of the gyro.

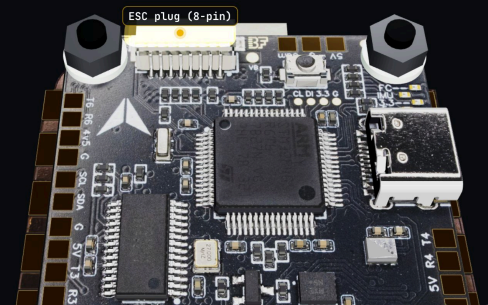
## 2 Vishnu 60 first

The Vishnu 60 goes on first, turned so its battery pads face away from the Brahma F4's ESC plug. Solder the capacitor and battery leads before you mount it.



## 3 Brahma F4 on top

The Brahma F4 goes on top, arrow pointing forward. Join the two boards with the 8-pin cable from the box, then fit the four nuts: snug, not tight, so the grommets keep their give.



## The two boards

### Brahma F4

Specifications, every pad, UARTs, wiring, firmware.

[Open the Brahma F4 docs →](#)

### Vishnu 60

Specifications, battery, motor numbering.

[Open the Vishnu 60 docs →](#)

## Firmware

The stack ships with the firmware you choose when you order. To reflash:

### Betaflight

Freestyle and racing: the fastest tune and the biggest community.

[How to flash Betaflight on the Brahma F4 →](#)

### INAV

GPS features for fixed-wing and long range: return to home, waypoints.

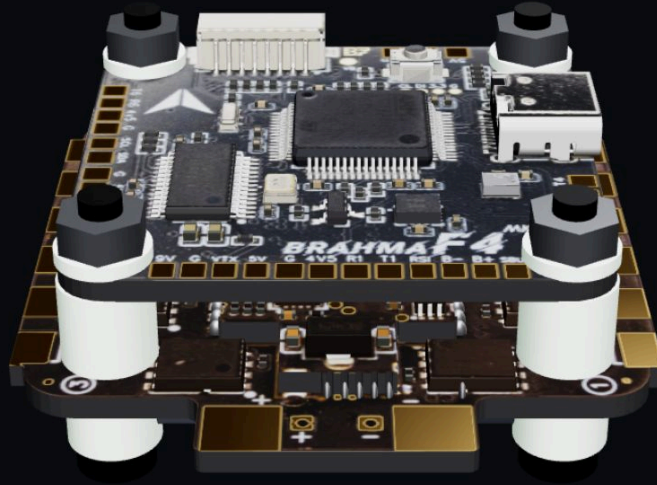
[How to flash INAV on the Brahma F4 →](#)

### ArduPilot

Autonomous missions, mapping, delivery and industrial UAVs.

[How to flash ArduPilot on the Brahma F4 →](#)

## In the box



- 1 × Brahma F4
- 1 × Vishnu 60
- 1 × 8-pin ESC-FC cable
- 8 × grommets
- 1 × 1000  $\mu$ F low-ESR capacitor
- 1 × XT60 battery connector
- 12 AWG battery wire
- 4 × M3 25 mm screws
- 4 × M3 nuts
- 1 × tin box

## Downloads

### Stack 460 manual (PDF)

The original slide manual

## Warranty

The Stack 460 has a 6-month warranty against manufacturing defects from the date of purchase. Keep your invoice: we need a copy for any claim.

### Not covered:

- Physical damage from use, such as water damage or tampered components.
- A burnt circuit from wrong wiring or overloading.
- A burnt ESC from spinning motors without propellers above 15% throttle while checking motor direction.
- A burnt ESC from arming without propellers in Angle mode: the flight controller keeps trying to level the craft and the motors will not slow down when you lower the throttle.

**How a claim works:** we inspect the board for physical damage and the points above. If it is eligible we replace it at no cost, and help you with your build. WhatsApp or call [+91 80171 93277](tel:+918017193277).

## 02 Brahma F4 flight controller

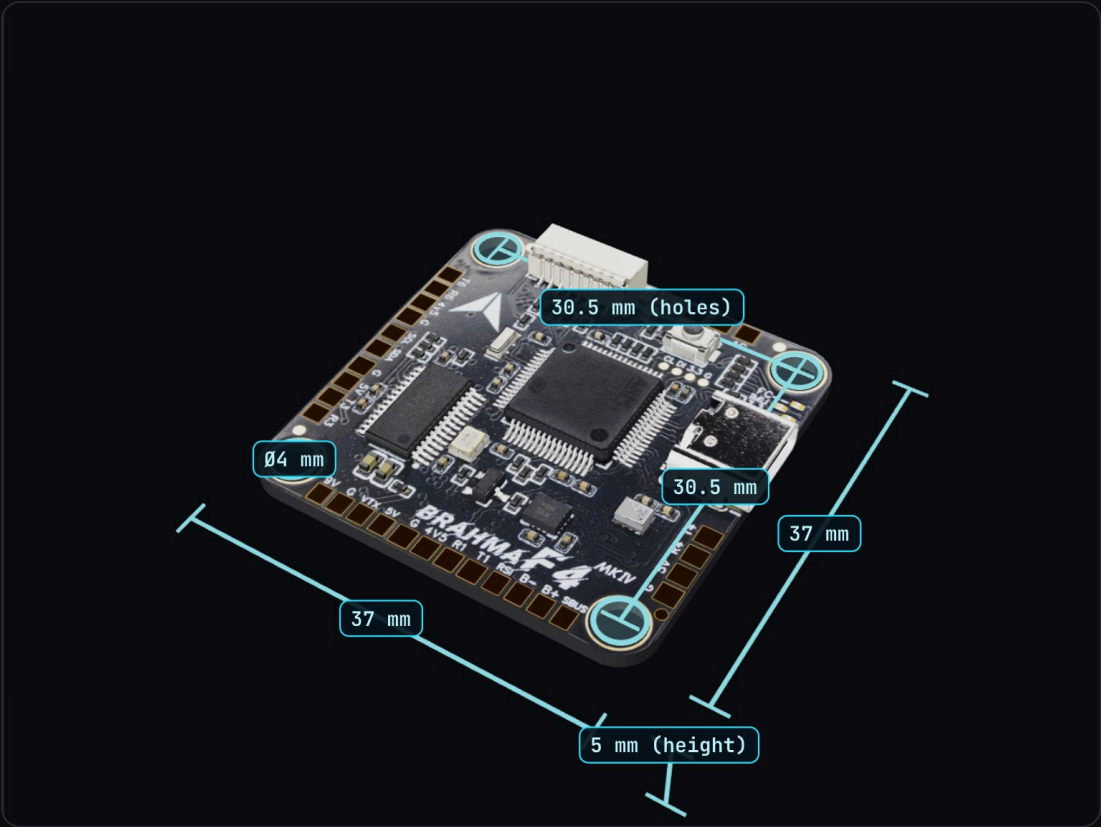
An STM32F405 flight controller for Betaflight, INAV and ArduPilot, with a BMI270 gyroscope, four UARTs, eight motor outputs and 32MB of Blackbox memory.

### Specifications

|                   |                                                                                          |
|-------------------|------------------------------------------------------------------------------------------|
| Product           | Darkmatter® Brahma F4 MKIV flight controller                                             |
| Processor (MCU)   | STM32F405                                                                                |
| Gyroscope (IMU)   | BMI270 (6-axis)                                                                          |
| Barometer         | DPS310                                                                                   |
| On-screen display | AT7456E                                                                                  |
| Blackbox          | 32MB Winbond flash                                                                       |
| USB               | Type-C                                                                                   |
| Firmware          | Betaflight, INAV, ArduPilot                                                              |
| Power input       | 2–6S LiPo, through the V and G pins of the 8-pin ESC plug or the 8 pads on the underside |
| Mounting          | 30.5 × 30.5 mm, 4 mm holes                                                               |
| Dimensions        | 37 × 37 × 5 mm                                                                           |
| Weight            | 9 g                                                                                      |
| 5V output         | 7 groups, 2A total                                                                       |
| 9V output         | 1 pad, 2A                                                                                |
| 4.5V output       | 500mA from USB, for the receiver on the bench                                            |
| 3.3V output       | Up to 500mA                                                                              |
| LED               | 5V, G and LED pads on the underside (WS2812)                                             |
| Buzzer            | BZ+ and BZ– pads                                                                         |
| Motors            | 8: M1–M4 on the ESC plug, M5–M8 on underside pads                                        |
| Digital VTX       | Direct soldering (DJI and others)                                                        |
| BOOT button       | Hold it while plugging in USB to enter DFU mode                                          |
| RSSI input        | RSI pad                                                                                  |
| UART              | 4: UART1, UART3 (ESC telemetry on R3), UART4, UART6                                      |

|                       |                  |
|-----------------------|------------------|
| I <sup>2</sup> C      | SDA and SCL pads |
| Betaflight target     | BRAHMA_F405      |
| Operating temperature | -10 °C to 70 °C  |
| Made in               | India            |

Dimensions and mounting



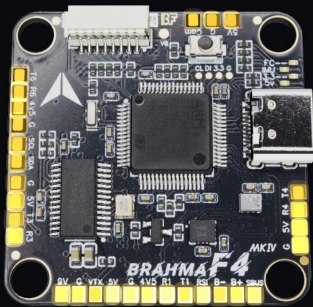
37 × 37 mm, 5 mm tall, 1.6 mm PCB. Holes 4 mm on a 30.5 × 30.5 mm pattern. Use the soft grommets from the box so frame vibration stays out of the gyro.

UARTs and serial ports

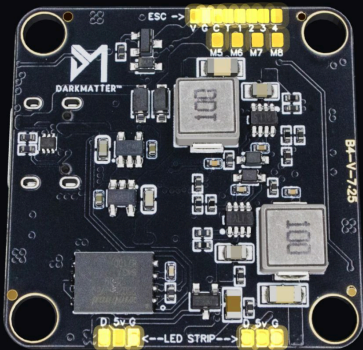
| UART  | Pads       | ArduPilot                 | Notes                                             |
|-------|------------|---------------------------|---------------------------------------------------|
| UART1 | T1 R1 SBUS | SERIAL1 · RC input        | Receiver; the SBUS pad is inverted and goes to R1 |
| UART3 | T3 R3      | SERIAL2 · ESC telemetry   | ESC telemetry on R3                               |
| UART4 | T4 R4      | SERIAL4 · MSP DisplayPort | Digital OSD                                       |
| UART6 | T6 R6      | SERIAL3 · GPS 1           | GPS                                               |

ArduPilot order from the official BrahmaF4 board file.

# Every pad



Top: every pad lit, names as printed on the board



Underside: every pad lit, names as printed on the board

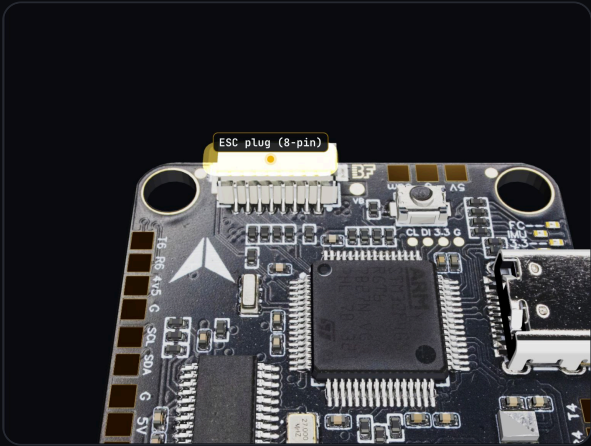
Every pad, by name. The same names are printed next to the pads on the board.

- R1R3R4R6T1T3T4T61 underside2 underside3 underside4 underside
- 4V5 × 25V × 45V underside × 29VBZ+BZ-C undersideCAMG × 6G underside × 3
- LED underside × 2M5 undersideM6 undersideM7 undersideM8 undersideRSISBUSSCLSDA
- T undersideV undersideVTX

## Wiring

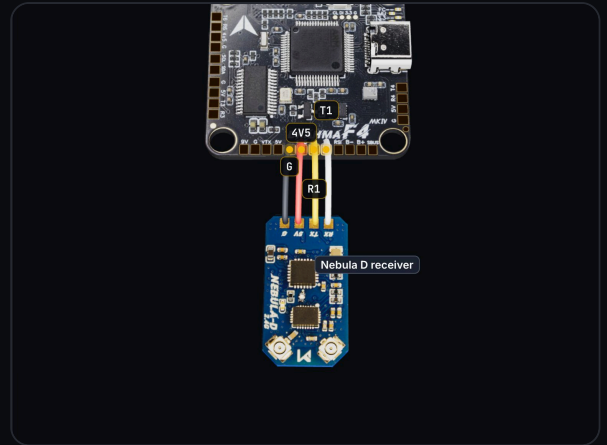
### 1 ESC

Plug a Vishnu 4-in-1 ESC into the 8-pin port with the cable from the box: battery voltage, ground, current, ESC telemetry and M1-M4 in one plug (V, G, C, R3, 1, 2, 3, 4). Or solder the same signals to the 8 pads on the underside.



## 2 Receiver (ExpressLRS / CRSF)

On UART1: receiver TX → **R1**, receiver RX → **T1**, 5V → **4V5**, G → **G**. SBUS receivers go on the **SBUS** pad (inverted, routed to R1).

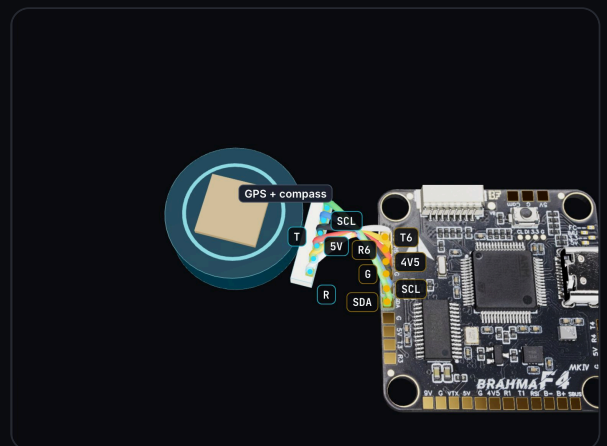


## 3 GPS and compass

GPS on UART6: GPS TX → **R6**, GPS RX → **T6**.  
Compass: **SCL**, **SDA**. Power from the **4V5** and **G** pads between R6 and SCL: 4V5 is live on USB too, so the GPS gets its fix on the bench without a battery.

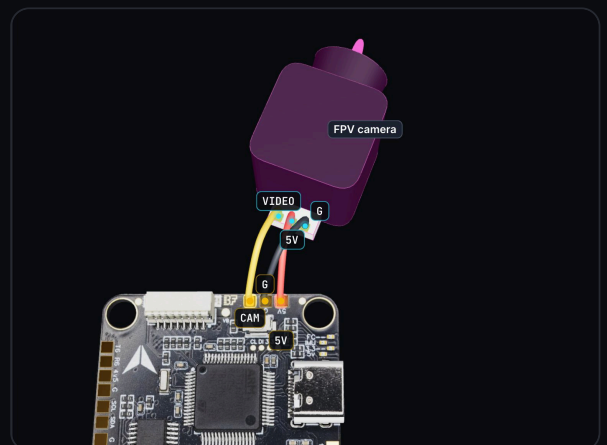
### TIP

Mount the GPS on a mast, away from the VTX, the ESC and the battery leads, with its arrow pointing forward.



## 4 Analog camera

Camera video → **CAM**, power from **5V** and **G** on the top edge.



## 5 Analog VTX

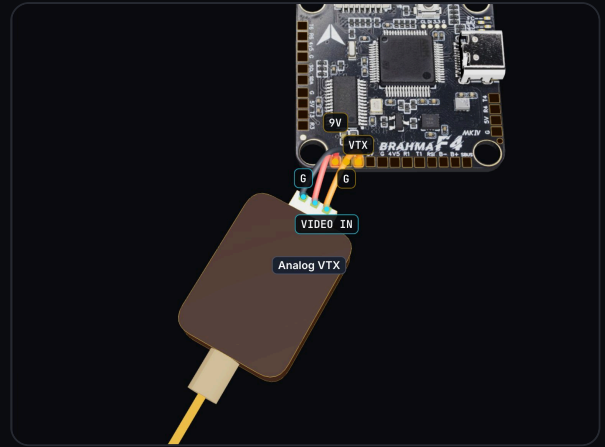
The video goes through the flight controller so the OSD can draw on it: camera video → **CAM**, and **VTX** → the video transmitter's video input.

VTX video in ← **VTX**, power from **9V** and **G** on the bottom edge. For SmartAudio or Tramp, connect the VTX control wire to a free UART TX pad and set it as the VTX peripheral in the Ports tab.

Pick **TBS SmartAudio** or **IRC Tramp** for that UART in the Ports tab (check which one your VTX uses) and load a VTX table in the Video Transmitter tab, or the VTX menu will not work. Camera and VTX grounds go to the same ground pad, or pads next to each other, to keep lines out of the picture.

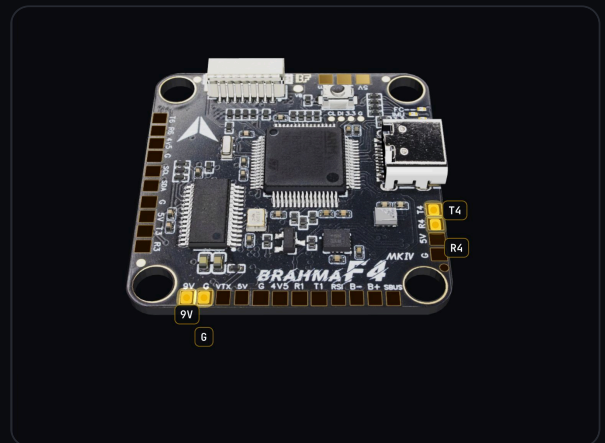
### IMPORTANT

Screw the antenna on before the VTX gets power. A VTX that transmits without an antenna can burn out in seconds.



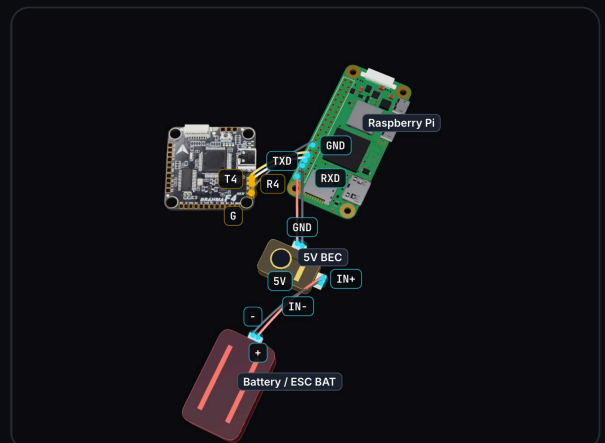
## 6 Digital VTX

A digital air unit is soldered directly: **9V**, **G**, and UART4 (**T4/R4**) for MSP DisplayPort.



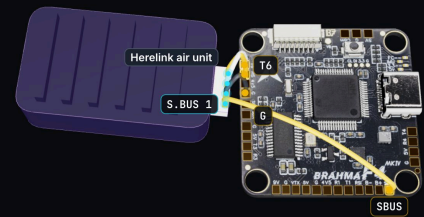
## 7 Companion computer

A Raspberry Pi on UART4: **T4** → **Pi pin 10 (RXD)**, **R4** → **Pi pin 8 (TXD)**, **G** → **Pi pin 14 (GND)**. The Pi is powered by its own 5V BEC on pins 2 and 6, fed from the ESC battery pads or any suitable battery supply. The Pi gets its own 5V BEC. [Full guide](#) →



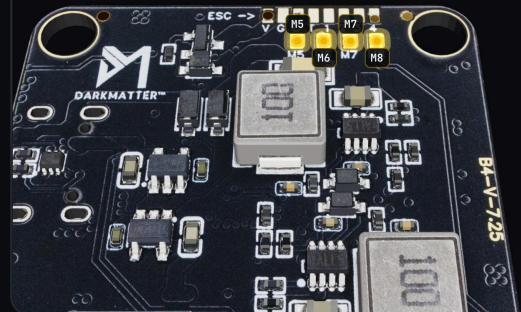
## 8 Herelink

S.Bus out 1 → **SBUS** pad, telemetry on UART6 (**T6/R6**).  
[Full guide](#) →



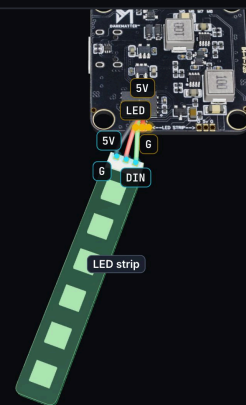
## 9 Motors 5–8

For hexa- and octocopters, a second 4-in-1 ESC or single ESCs are soldered to **M5–M8** on the underside. In ArduPilot a servo can go on **M5**. [Servo guide](#) →



## 10 LED strip

WS2812 LEDs on the underside: data → **LED**, **5V**, **G** (two sets).



## Firmware

Every Brahma F4 ships with the firmware you pick when you order. You can reflash it any time with one of these guides.

### Betaflight

Freestyle and racing: the fastest tune and the biggest community.

[How to flash Betaflight on the Brahma F4 →](#)

### INAV

GPS features for fixed-wing and long range: return to home, waypoints.

[How to flash INAV on the Brahma F4 →](#)

### ArduPilot

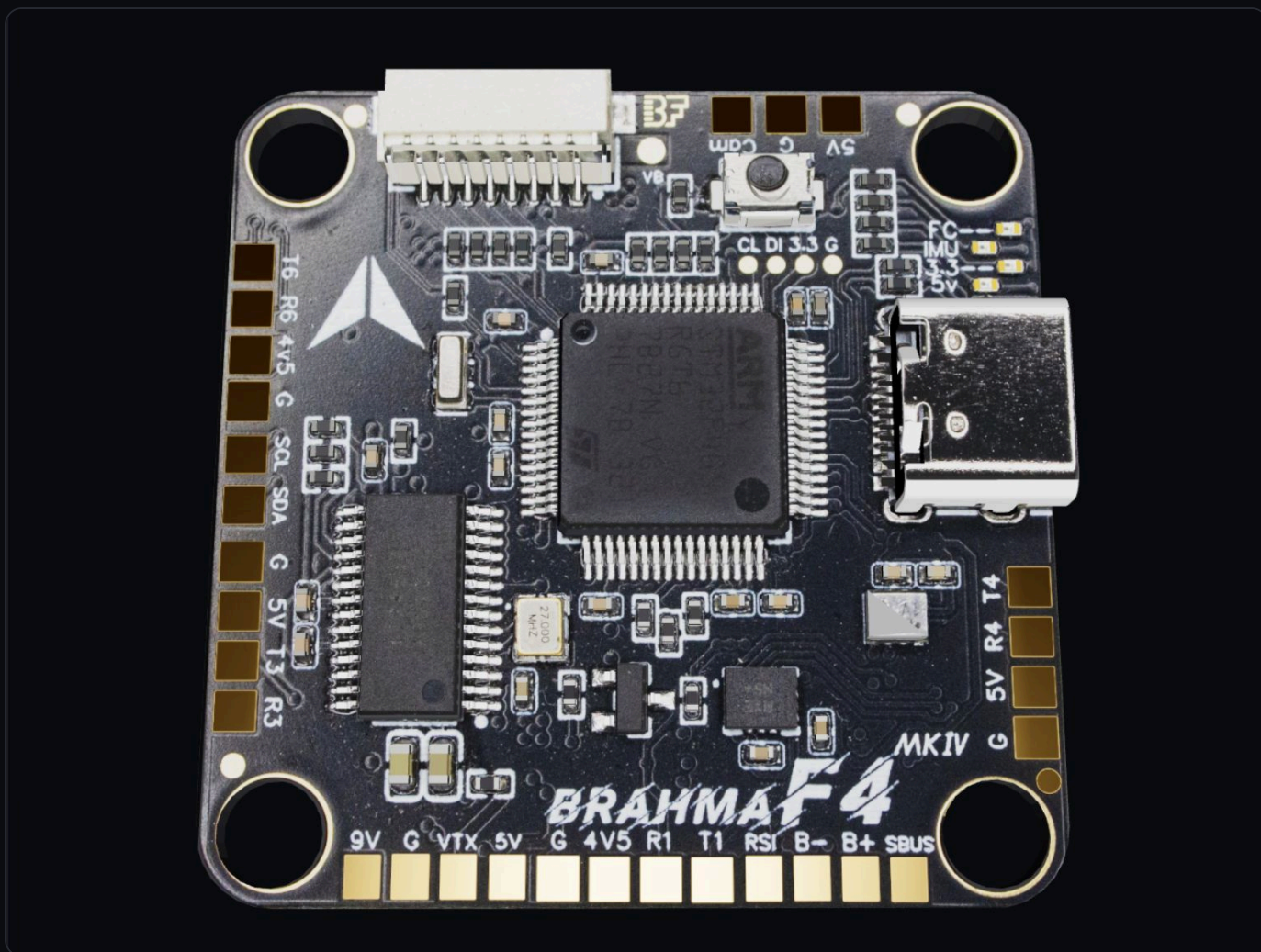
Autonomous missions, mapping, delivery and industrial UAVs.

[How to flash ArduPilot on the Brahma F4 →](#)

## Connect accessories

- [Connect a receiver \(ExpressLRS, IBUS\)](#)
- [Connect servos](#)
- [Connect Herelink](#)
- [Connect a companion computer \(Raspberry Pi\)](#)

## In the box



- 1 × Brahma F4 flight controller
- 1 × SH 1.0 mm 8-pin cable, 30 mm (flight controller to ESC)

## Downloads

### Brahma F4 manual (PDF)

The original slide manual

Firmware files: see each firmware guide above, or **all downloads**.

## Warranty

The Brahma F4 flight controller has a 6-month warranty against manufacturing defects from the date of purchase. Keep your invoice: we need a copy for any claim.

### Not covered:

- Physical damage from use, such as water damage or tampered components.
- A burnt circuit from wrong wiring or overloading.

**How a claim works:** we inspect the board for physical damage and the points above. If it is eligible we replace it at no cost, and help you with your build. WhatsApp or call [+91 80171 93277](tel:+918017193277).

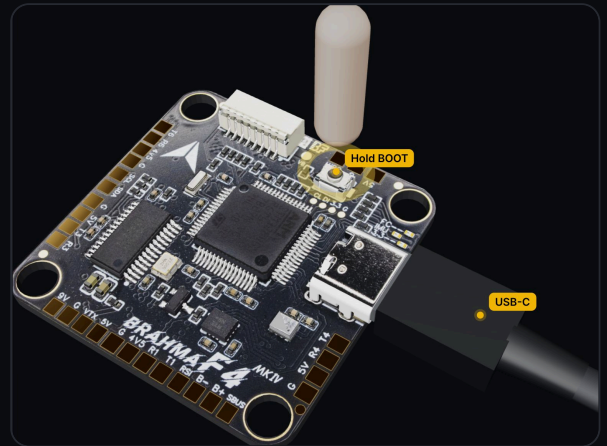
## 03 How to flash Betaflight on the Brahma F4

The Brahma F4 is an official Betaflight target, `BRAHMA_F405`: Betaflight Configurator builds the firmware for you online. About 5 minutes.

**You need:** [Betaflight Configurator](#), a USB-C data cable

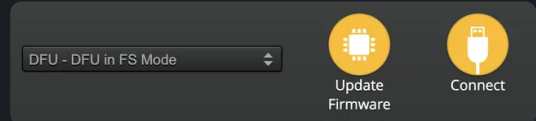
### 1 Hold BOOT and plug in USB-C

Unplug the battery. Press and hold the **BOOT** button on the Brahma F4, then plug the USB-C cable into your computer. Release the button once it is plugged in: the board starts in DFU (flashing) mode.



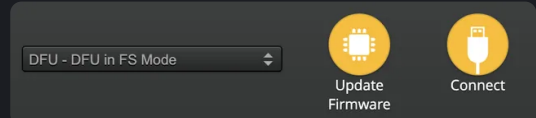
### 2 Open Betaflight Configurator

Open Betaflight Configurator. The board shows up as **DFU** instead of a COM port. If it does not, try another cable (some USB-C cables carry power only) and hold BOOT while plugging in again. On Windows, a board that shows up as "STM32 BOOTLOADER" but not as DFU needs its driver fixed: run ImpulseRC Driver Fixer, or switch it to WinUSB with Zadig.



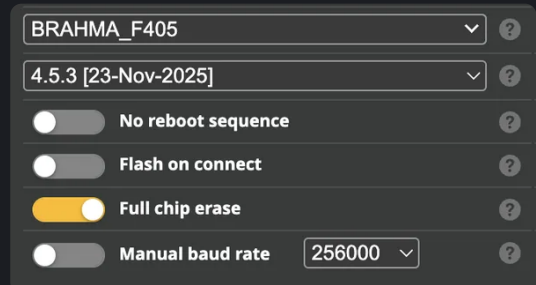
### 3 Update Firmware

With **DFU** selected, click **Update Firmware**.



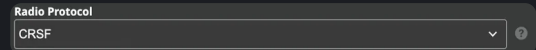
### 4 Choose the board

Board: **BRAHMA\_F405**. Version: the latest stable release (we use 4.5.3). Turn on **Full chip erase**.



## 5 Radio protocol

**CRSF** for ExpressLRS receivers such as the Nebula D.  
**IBUS** for FlySky.

A screenshot of a software interface showing a dropdown menu labeled "Radio Protocol". The menu is open, and "CRSF" is selected. There is a question mark icon to the right of the dropdown.

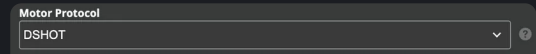
## 6 Other options

Add **Magnetometers** if you will fit a compass. GPS, LED strip, OSD and VTX are already in the list.

A screenshot of a software interface showing a section titled "Other Options". It contains several checkboxes and labels: "Acro Trainer", "GPS", "LED Strip", "Magnetometers", "OSD (Analog)", "OSD (Digital)", "Pin IO", and "VTX". The "Magnetometers" checkbox is highlighted.

## 7 Motor protocol

**DSHOT** for Vishnu ESCs. Most other single ESCs use PWM.

A screenshot of a software interface showing a dropdown menu labeled "Motor Protocol". The menu is open, and "DSHOT" is selected. There is a question mark icon to the right of the dropdown.

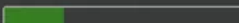
## 8 Build and flash

Click **Load Firmware [Online]** and wait for the cloud build. Then click **Flash Firmware** and wait for erasing and flashing to finish. If it stops with "read protection not active", untick **Full chip erase** and flash again, then type `defaults` in the CLI.

### Load Firmware [Online]

**Target:** BRAHMA\_F405  
**Manufacturer ID:** DARK  
**Version:** 4.5.3  
**MCU:** STM32F405  
**Date:** 23-Nov-2025 00:00  
**Configuration Filename:** [default]

#### Cloud Build Details:

**Status:**  processing

**Cancel**

9

## Close the warning, open the CLI

Connect, close the accelerometer warning, and open **CLI** from the menu on the left.

### Warning

The following problems with your configuration were detected:

- the accelerometer is enabled but it is not calibrated.

If you plan to use the accelerometer, please follow the instructions for 'Calibrate Accelerometer' on the 'Setup' tab. If any function that requires the accelerometer (auto level modes, GPS rescue, ...) is enabled, arming of the craft will be disabled until the accelerometer has been calibrated.

If you are not planning on using the accelerometer it is recommended that you disable it in 'System configuration' on the 'Configuration' tab.

You need to fix these problems before attempting to fly your craft.

Close

## Setup

### Ports

### Configuration

### Power & Battery

### Failsafe

### Presets

### PID Tuning

### Receiver

### Modes

### Adjustments

### Motors

### OSD

### Video Transmitter

### LED Strip

### Sensors

### Tethered Logging

### Blackbox

### CLI

## 10 Paste the Brahma F4 settings

Paste these lines and press Enter. They set DShot300, the analog OSD, the LED timer and the buzzer.

```
set motor_pwm_protocol = DSHOT300
set vcd_video_system = AUTO
set osd_displayport_device = MAX7456
timer C08 AF3
dma pin C08 0
set beeper_od = OFF
set beeper_inversion = ON
save
```

Write your command here. Press Tab for AutoComplete.

## Before the first flight

### 1 Accelerometer

**Setup** tab: put the quad on a level surface and click **Calibrate Accelerometer**. Tilt it by hand: the 3D model on screen must follow.

### 2 Receiver

**Ports**: Serial Rx on UART1. **Receiver** tab: Serial (via UART), provider CRSF, telemetry on. Move each stick and check the bars follow the right channel (AETR for ExpressLRS). Set a switch for ARM in **Modes**.

### 3 Motors, props off

Battery through a smoke stopper, props off. In **Motors**, spin each motor at low throttle and check it matches the position and direction in Betaflight's diagram. Reorder or reverse there instead of re-soldering.



---

#### 4 Failsafe

**Failsafe** tab (turn on Expert Mode if you do not see it): stage 2 is **Drop** by default, right for freestyle. For long range use GPS Rescue, and only after the GPS shows 8 or more satellites and you have tested it close and low. Switch the radio off with the props off and check the quad disarms.

---

#### 5 RPM filter

With BlueJay on the Vishnu ESC, use **DShot300**, turn on bidirectional DShot and set the motor poles (usually 14). In the Motors tab every motor must show RPM and an error rate (E) of 0%; if not, drop to DShot150.

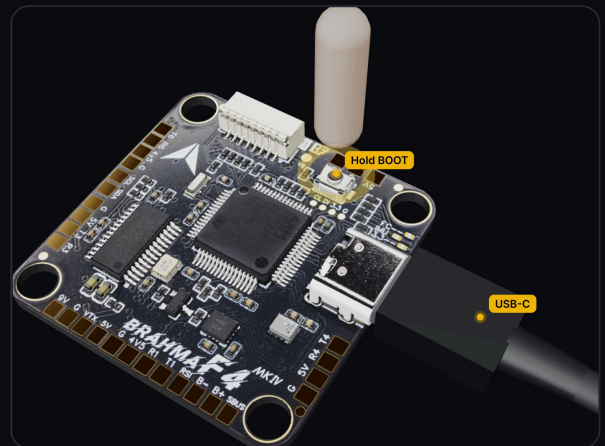
## 04 How to flash INAV on the Brahma F4

The Brahma F4 is an official INAV target, `BRAHMA_F405`. About 10 minutes, including the setup wizard.

**You need:** [INAV Configurator](#), a USB-C data cable

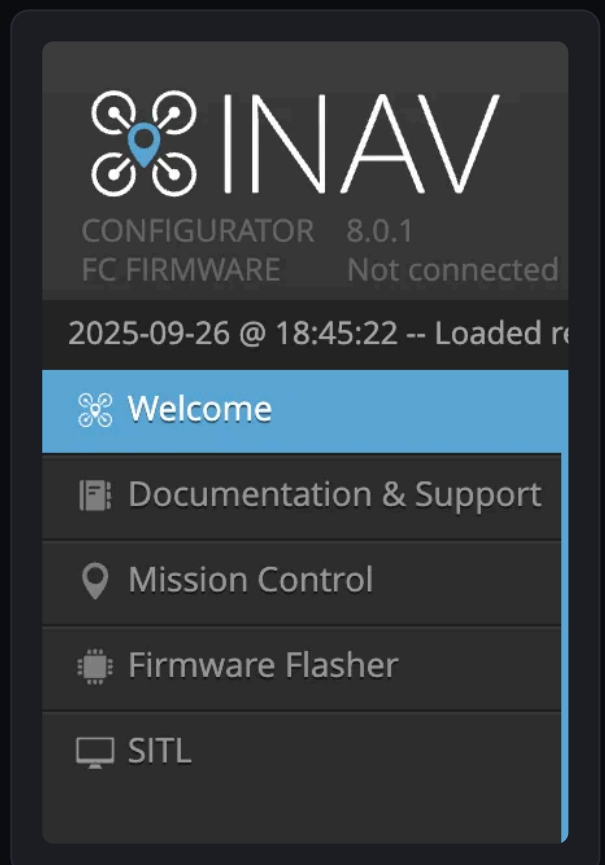
### 1 Hold BOOT and plug in USB-C

Unplug the battery. Press and hold the **BOOT** button on the Brahma F4, then plug the USB-C cable into your computer. Release the button once it is plugged in: the board starts in DFU (flashing) mode.



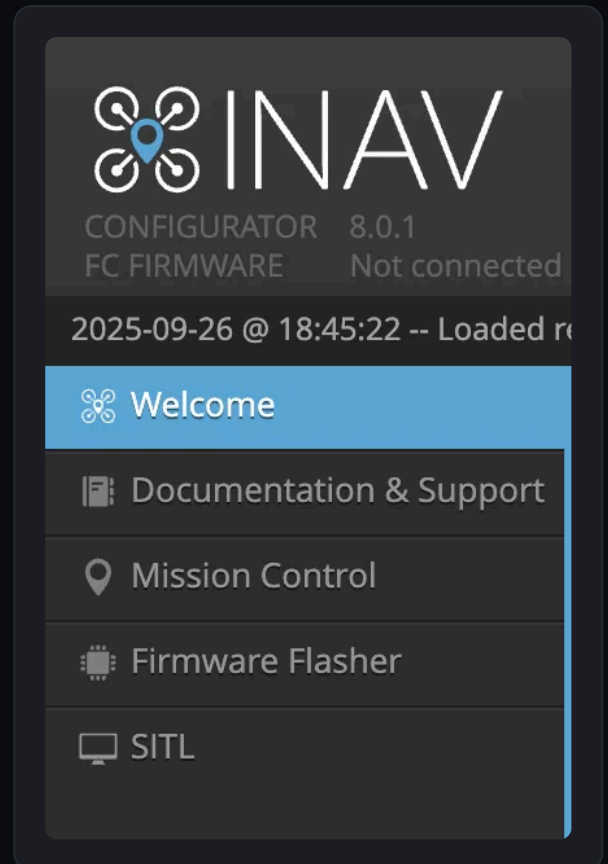
### 2 Open INAV Configurator

Open INAV Configurator. The board shows up as **DFU** instead of a COM port. If it does not, try another cable (some USB-C cables carry power only) and hold BOOT while plugging in again. On Windows, a board that shows up as "STM32 BOOTLOADER" but not as DFU needs its driver fixed: run ImpulseRC Driver Fixer, or switch it to WinUSB with Zadig.



### 3 Firmware Flasher

Once the board shows as DFU, open **Firmware Flasher**.

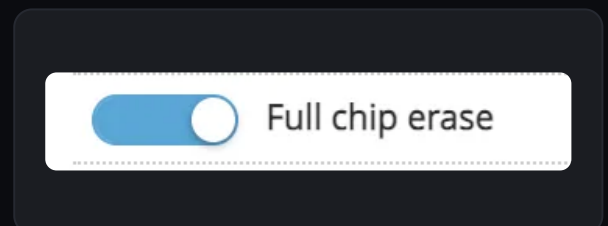


### 4 Choose the target

Target: **BRAHMA\_F405**, the latest stable release. Turn on **Full chip erase**.

Or use our tested build with **Load Firmware [Local]**:

**inav\_8.1.0\_BRAHMA\_F405-DARKMATTER.hex**  
INAV 8.1.0, Darkmatter stable build



### 5 Flash

Click **Load Firmware [Online]**, then **Flash Firmware**. Wait for erasing and flashing to finish.



## 6 Craft type

Connect. The setup wizard asks what you are building: pick your craft so INAV loads the right defaults.

### Default values

INAV Configurator would like to know which kind of UAV you are configuring. Based on this information it will modify some default values to unlock the best flying performance.

Avoid blindly restoring all PID and filter configuration from the previous version of INAV. The best result can be obtained by retuning from defaults!

Mini Quad with 3" propellers

Mini Quad with 5" propellers

Mini Quad with 7" propellers

Airplane with a Tail

Airplane without a Tail (Wing, Delta, etc)

Rovers & Boats

Keep current settings (Not recommended)

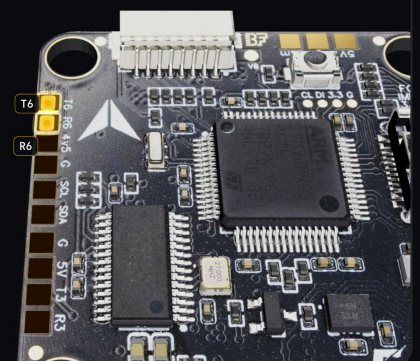
## 7 Receiver

Receiver serial port: **UART1**. Protocol: **CRSF** for ExpressLRS.



## 8 GPS

GPS serial port: **UART6** (T6/R6), 115200 baud, protocol UBLOX.



## 05 How to flash ArduPilot on the Brahma F4

The Brahma F4 is an official ArduPilot board, **BrahmaF4**. Flash the firmware with the bootloader once; after that, update from Mission Planner. About 10 minutes.

**You need:** [STM32CubeProgrammer](#), [Mission Planner](#), a USB-C data cable

### 1 Download the firmware

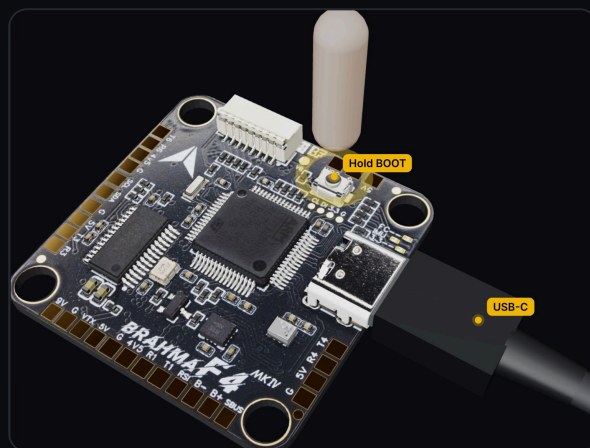
#### ArduCopter 4.7.0 (with bootloader)

ArduCopter 4.7.0 with bootloader

The same files are on the [ArduPilot firmware server \(BrahmaF4\)](#) in the folder **BrahmaF4**.

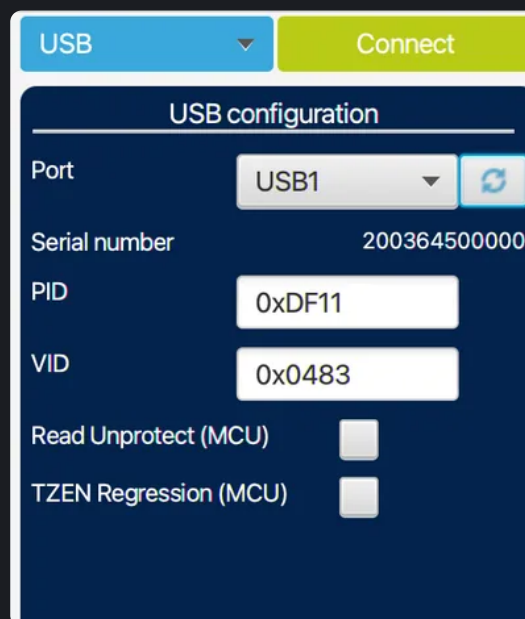
### 2 Hold BOOT and plug in USB-C

Unplug the battery. Press and hold the **BOOT** button on the Brahma F4, then plug the USB-C cable into your computer. Release the button once it is plugged in: the board starts in DFU (flashing) mode.



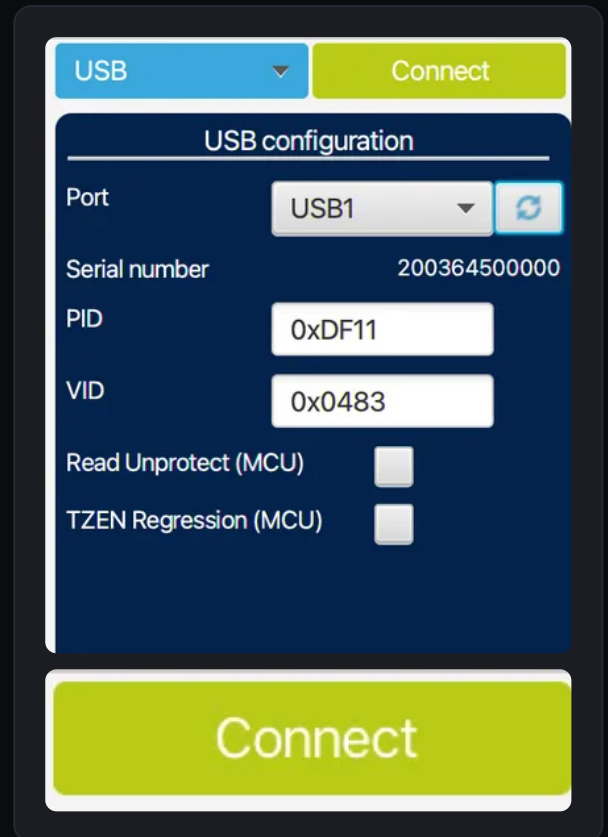
### 3 Open STM32CubeProgrammer

Open STM32CubeProgrammer. The board shows up as **DFU** instead of a COM port. If it does not, try another cable (some USB-C cables carry power only) and hold BOOT while plugging in again. On Windows, a board that shows up as "STM32 BOOTLOADER" but not as DFU needs its driver fixed: run ImpulseRC Driver Fixer, or switch it to WinUSB with Zadig.



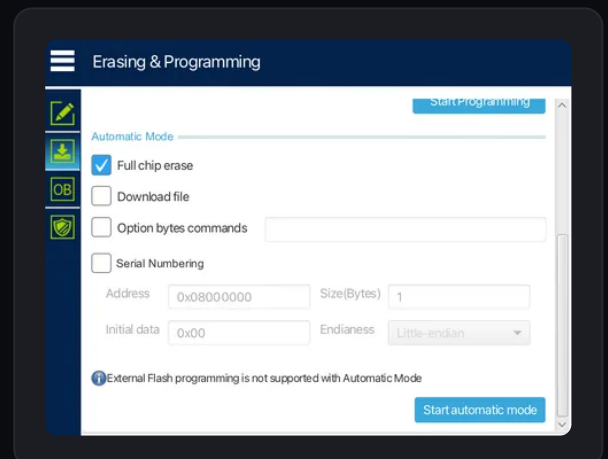
#### 4 Connect STM32CubeProgrammer

Choose **USB** in the drop-down and click **Connect**.



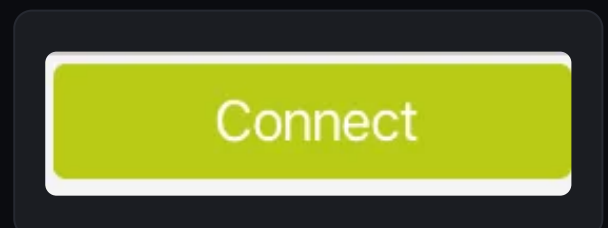
#### 5 Full chip erase

Open the second menu item, **Erasing & Programming**, and click **Full chip erase**. Confirm, and wait for the log to say it is done and to ask you to disconnect. Disconnect.



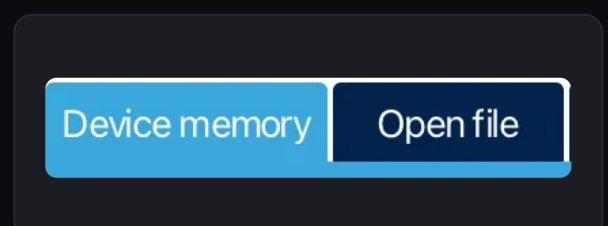
#### 6 Connect again

Click **Connect** again.



#### 7 Open the file

Go to the first tab, click **Open file** and choose `arducopter_with_bl.hex`.



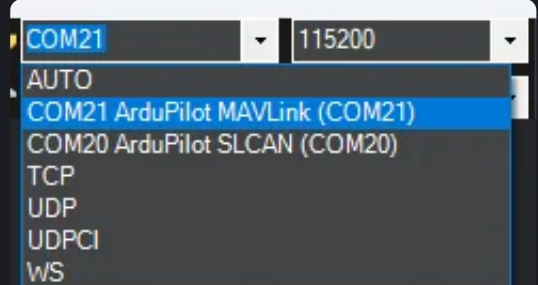
## 8 Download

Click **Download** and wait until flashing is complete.

Download

## 9 Mission Planner

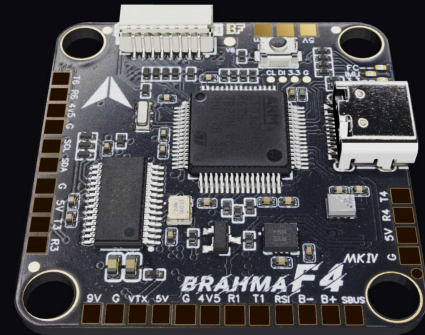
Unplug, plug USB in again (without BOOT), open Mission Planner, choose the COM port that shows as **ArduPilot**, and click **Connect**.



## 10 Optical flow (optional)

For an optical-flow sensor, load this build from Mission Planner's **Load custom firmware**: it unlocks the FLOW settings.

**Copter\_BrahmaF4\_With\_flow-DARKMATTER.apj**  
ArduCopter with optical-flow support (.apj)



## Serial ports in ArduPilot

| ArduPilot | Port                    | Default         |
|-----------|-------------------------|-----------------|
| SERIAL0   | USB                     | MAVLink         |
| SERIAL1   | UART1 (R1/T1, SBUS pad) | RC input        |
| SERIAL2   | UART3 (R3/T3)           | ESC telemetry   |
| SERIAL3   | UART6 (R6/T6)           | GPS 1           |
| SERIAL4   | UART4 (R4/T4)           | MSP DisplayPort |

- UART1 and UART6 support DMA on RX and TX; UART3 and UART4 do not.
- ESC telemetry has to be set up for your ESC.
- RC input is on R1/T1 by default; the SBUS pad is inverted and goes to R1. CRSF also needs T1.

From the official [ArduPilot BrahmaF4 board page](#).

## 06 Connect a receiver to the Brahma F4

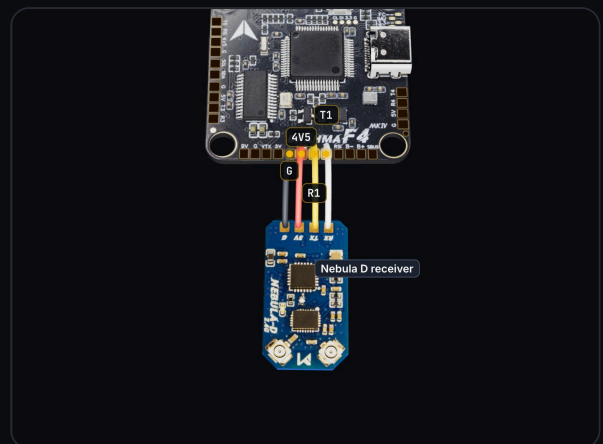
Your receiver goes on UART1. Here it is wire by wire.

### 1 ExpressLRS (Nebula D)

Four wires to UART1: receiver **TX** → **R1**, receiver **RX** → **T1**, **5V** → **4V5**, **G** → **G**. The 4V5 pad is live on USB, so you can bind and set up on the bench without a battery.

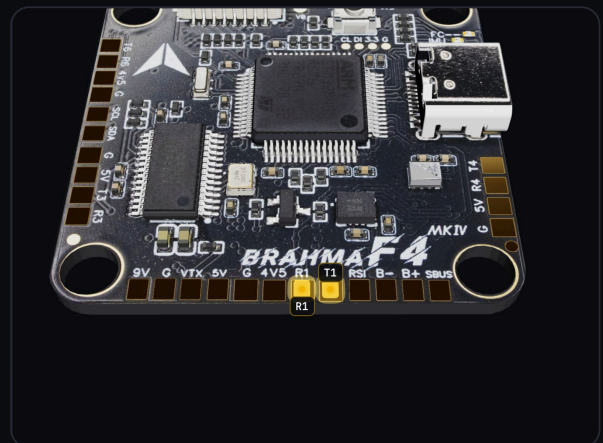
#### TIP

Receiver and transmitter must run the same ExpressLRS major version (3.x with 3.x). Set the same binding phrase on both, and the receiver binds on its own.



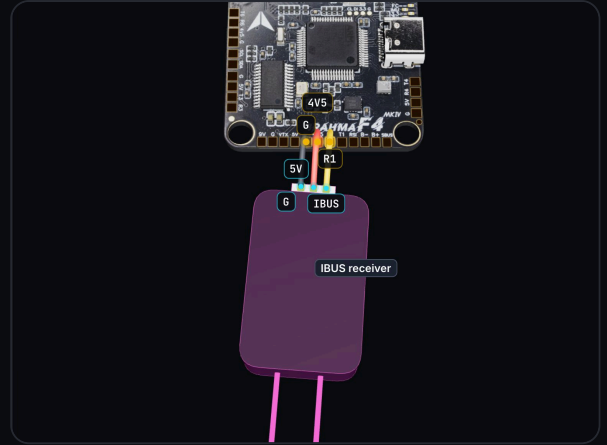
### 2 Betaflight / INAV

Betaflight: **Ports** tab → **Serial Rx** on UART1, receiver protocol CRSF. INAV: the setup wizard, receiver port UART1, CRSF.



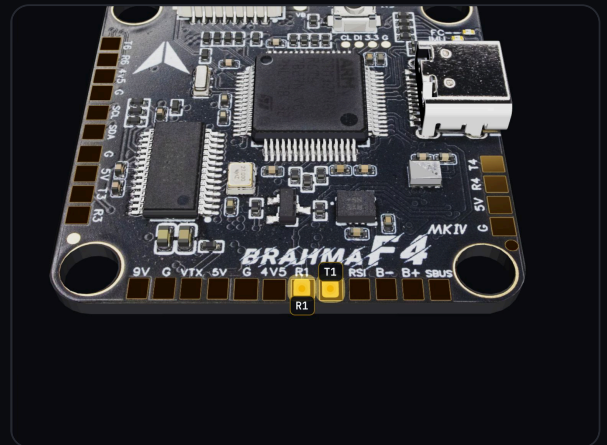
### 3 FlySky IBUS

Three wires: IBUS signal → **R1**, 5V → **4V5**, G → **G**. In Betaflight the firmware must be built with IBUS selected: reflash with IBUS, then turn on Serial Rx on UART1.



### 4 ArduPilot

SERIAL1 is RC input by default. For CRSF set SERIAL1\_OPTIONS = 0.



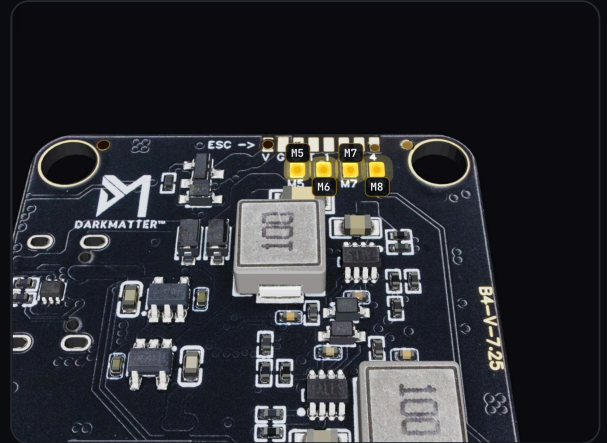
## 07 Connect servos to the Brahma F4

The Brahma F4 has no dedicated servo pads: in ArduPilot, servos go on the spare motor outputs on the underside. Use **M5** first.

You need: [Mission Planner](#)

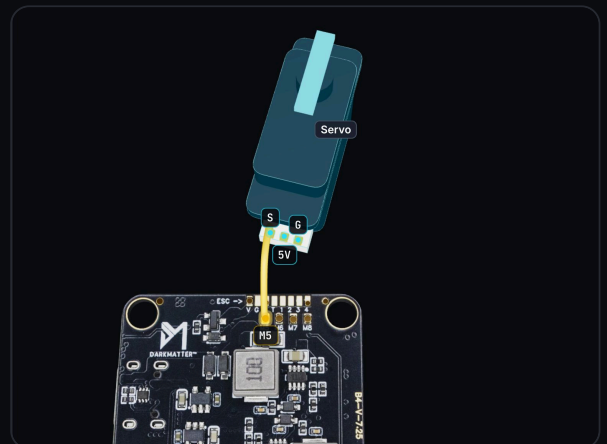
### 1 Turn the board over

M5–M8 are on the underside.



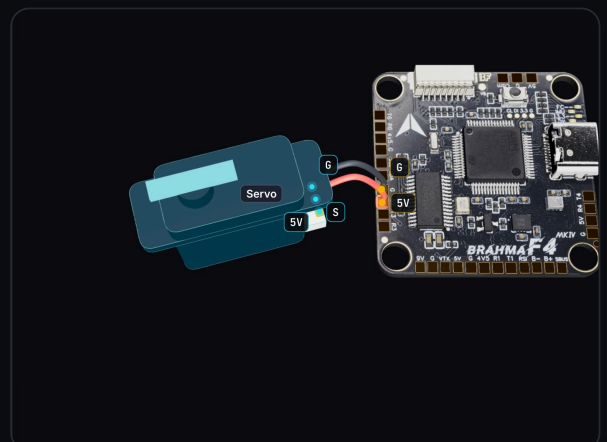
### 2 Servo on M5

Servo signal → **M5**. M5 has a timer of its own, so it can run at servo rate while M1–M4 run DShot.



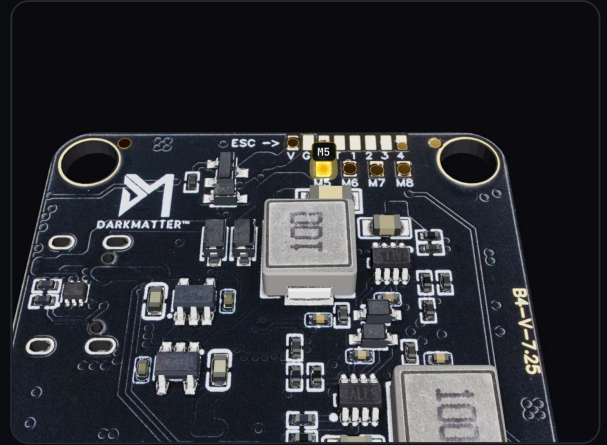
### 3 Power and ground

Servo power from the **5V** pad and **G** (2A shared) for a small servo, or from its own BEC with grounds joined.



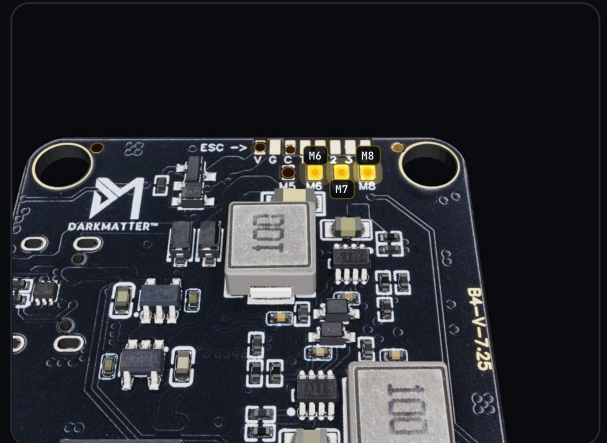
#### 4 ArduPilot: move it from your radio

Mission Planner → **Setup** → **Servo Output**. On output **5** (M5) set **Function** to the RC channel of the switch or knob that should move it, for example **RCIN9**. Set **Min**, **Trim** and **Max** on the same row so the servo stops at its ends without straining, and tick **Reverse** if it moves the wrong way.



#### 5 More servos?

Outputs are grouped by timer and every output in a group runs the same protocol and rate. On the Brahma F4, M6 and M7 share their timer with M1 and M2, so they cannot be servos while the motors use DShot. M8 shares its timer with the LED output.



Output groups from the official ArduPilot BrahmaF4 board file (M5: TIM4; M1, M2, M6, M7: TIM3; M8 and LED: TIM8).

## 08 Connect Herelink to the Brahma F4

Herelink gives you control (SBUS) and telemetry (MAVLink) over one link. ArduPilot.

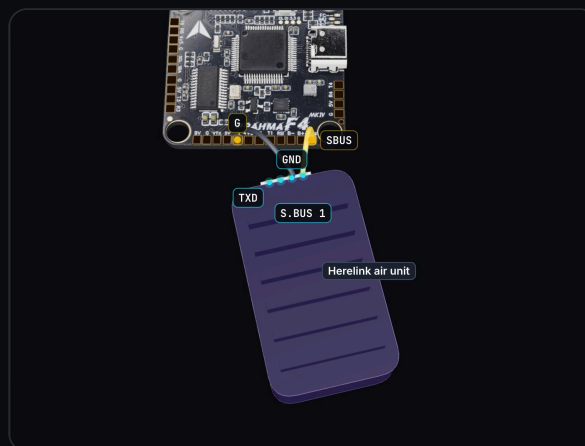
You need: [Mission Planner](#)

### 1 SBUS

Herelink **S.Bus out 1** → the **SBUS** pad, Herelink GND → **G**. The SBUS pad has a hardware inverter that feeds **R1** (UART1). Unplug any ExpressLRS receiver from UART1 first: ArduPilot takes only one RC input.

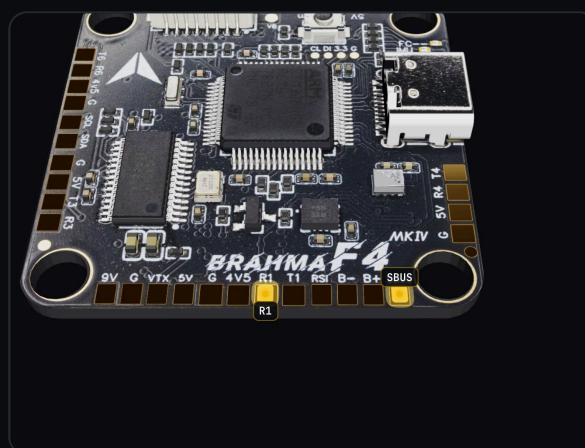
#### TIP

Power the Herelink air unit from the flight battery with its own power lead (see the Herelink manual); the flight controller only shares ground and the signal wires.



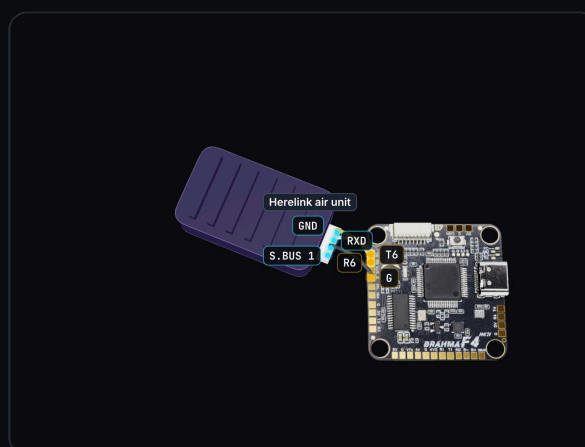
### 2 SBUS parameters

Nothing to change: UART1 is **SERIAL1 = RC input** by default. (Leave `SERIAL1_OPTIONS` at its default.)



### 3 Telemetry

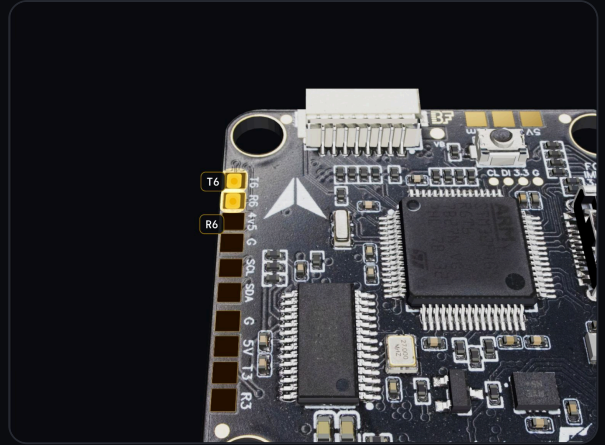
Herelink UART RXD → **T6**, TXD → **R6** (UART6).



#### 4 Telemetry parameters

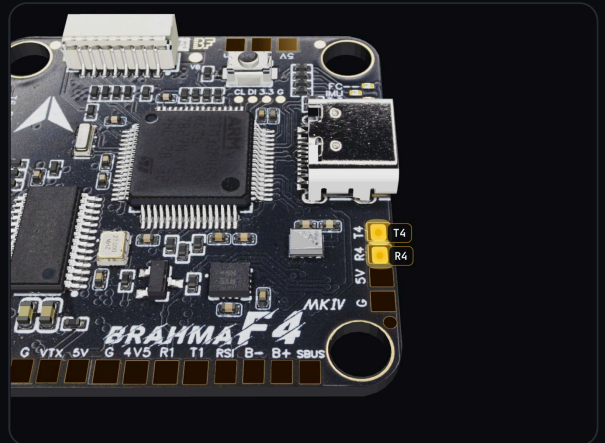
UART6 is SERIAL3 on the Brahma F4:

```
SERIAL3_PROTOCOL = 2    (MAVLink 2)
SERIAL3_BAUD = 57      (57600)
```



#### 5 Where the GPS goes now

UART6 is the GPS port by default; with Herelink telemetry there, put the GPS on UART4 (**T4/R4**) if you don't use a digital OSD, and set `SERIAL4_PROTOCOL = 5`.



## 09 Connect a Raspberry Pi to the Brahma F4

A companion computer talks MAVLink to ArduPilot over UART4. Any Raspberry Pi works.

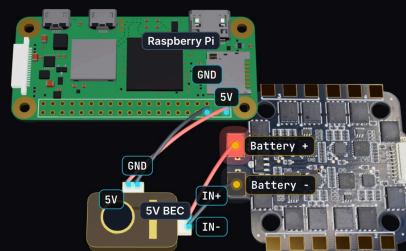
**You need:** [Mission Planner](#)

### 1 Power the Pi

Use a separate **5V BEC** rated for your battery (2–6S, so up to 25.2V in) and at least **3A** out (**5A** for a Raspberry Pi 5). **BEC IN+** → **ESC BAT+**, **BEC IN-** → **ESC BAT-** (or any suitable battery supply), then **BEC 5V** → **Pi pin 2 (5V)** and **BEC GND** → **Pi pin 6 (GND)**.

#### TIP

Check the BEC output with a multimeter before you connect the Pi: it must read 5.0–5.2V. In the next step a second Pi ground (pin 14) goes to the flight controller's G.

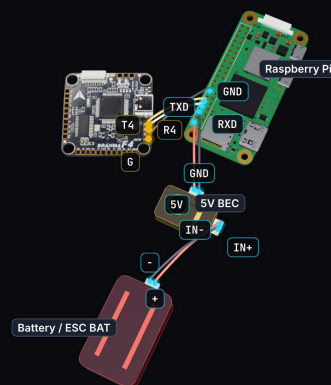


### 2 Wiring

Brahma **T4** → **Pi pin 10 (RXD, GPIO15)**, **R4** → **Pi pin 8 (TXD, GPIO14)**, **G** → **Pi pin 14 (GND)**. The BEC feeds **pin 2 (5V)** and **pin 6 (GND)**; its input (IN+ / IN-) goes to the ESC battery pads or any suitable battery supply.

#### IMPORTANT

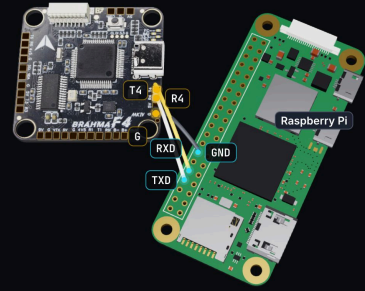
Do not power the Pi from the flight controller. A Pi draws current in bursts and the board can restart. Give the Pi its own BEC with a stable 5V.



### 3 ArduPilot parameters

UART4 is SERIAL4 on the Brahma F4:

```
SERIAL4_PROTOCOL = 2      (MAVLink 2)
SERIAL4_BAUD = 921        (921600)
```



### 4 Pi serial

On the Raspberry Pi:

```
sudo raspi-config
# Interface Options → Serial Port
# "Login shell over serial?" → No
# "Enable serial hardware?" → Yes
```

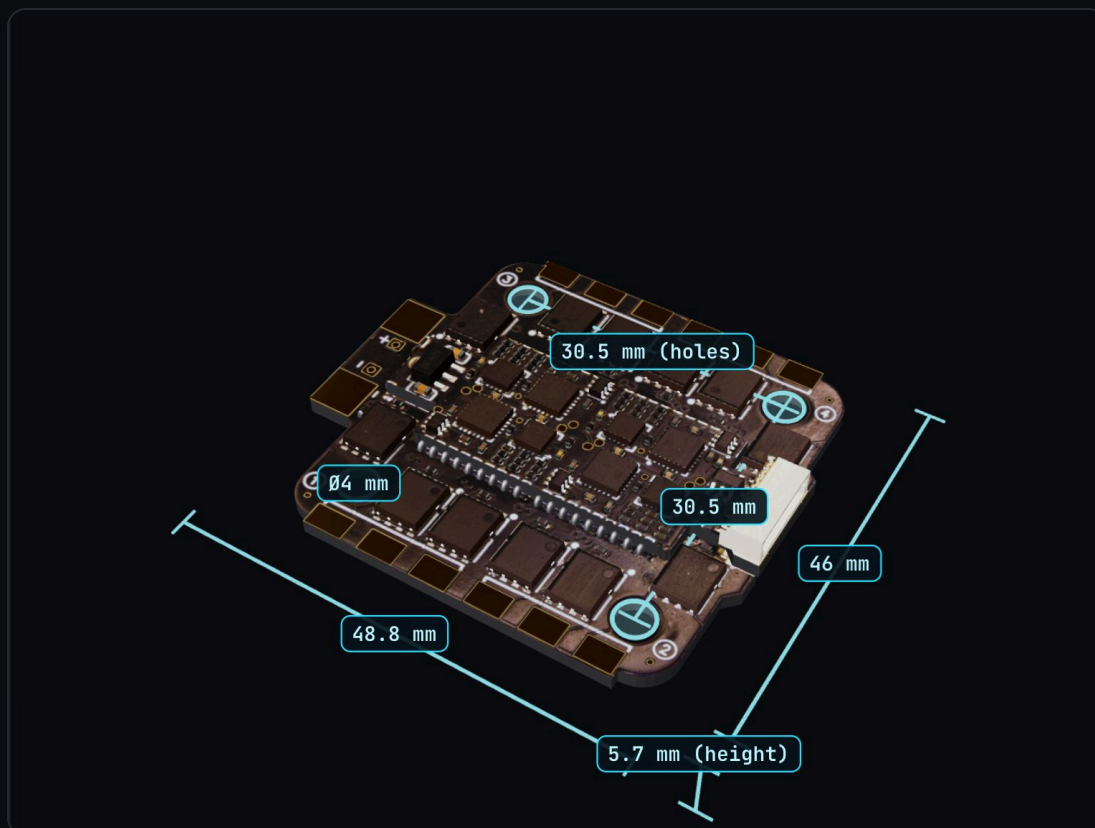
## 10 Vishnu 60 4-in-1 ESC

A 4-in-1 ESC for 2–6S builds: 60A continuous per motor, 90A burst, ships with BLHeli\_S (BlueJay ready), DShot300/600 and a built-in current sensor, on a 30.5 × 30.5 mm mount.

### Specifications

|                       |                                                                                                                                                                                                           |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product               | Darkmatter® Vishnu 60 4-in-1 ESC                                                                                                                                                                          |
| Firmware              | Ships with BLHeli_S. For RPM filtering (bidirectional DShot), flash BlueJay in ESC Configurator: target J-H-50                                                                                            |
| Continuous current    | 60A × 4 = 240A                                                                                                                                                                                            |
| Burst current         | 90A for 7 seconds                                                                                                                                                                                         |
| Protocol              | DSHOT300 / DSHOT600                                                                                                                                                                                       |
| Power input           | 2–6S LiPo                                                                                                                                                                                                 |
| Power output          | VBAT                                                                                                                                                                                                      |
| Current sensor        | Built in                                                                                                                                                                                                  |
| Mounting              | 30.5 × 30.5 mm, 4 mm holes                                                                                                                                                                                |
| Dimensions            | 46 × 48.8 × 5.7 mm                                                                                                                                                                                        |
| Weight                | 14 g                                                                                                                                                                                                      |
| Motors                | Check the maximum current in your motor maker's data: it should stay below 70–80A. If you will fly at full throttle most of the time with the biggest propeller the motor supports, stay at 60A or below. |
| Operating temperature | –20 °C to 70 °C                                                                                                                                                                                           |
| Made in               | India                                                                                                                                                                                                     |

## Dimensions and mounting



46 × 48.8 mm, 5.7 mm tall, 1.6 mm PCB. Holes 4 mm on the standard 30.5 × 30.5 mm pattern, so it stacks under any Brahma.

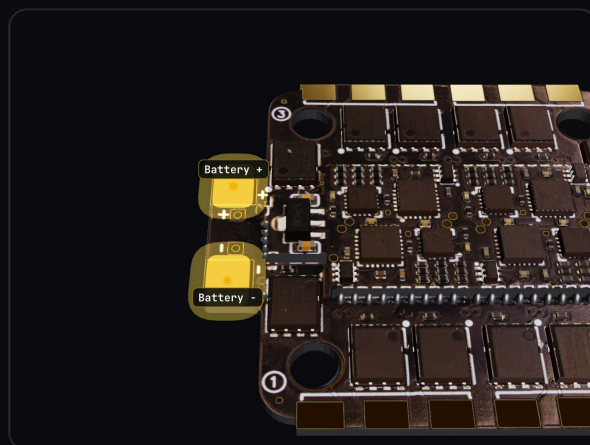
## Battery and capacitor

### 1 Solder the capacitor first

Solder the 1000  $\mu$ F low-ESR capacitor from the box across the battery pads: + to +, - to -. Connect the battery - lead to the capacitor's - side only.

#### IMPORTANT

Without the capacitor, voltage spikes from the motors can destroy the ESC.



### 2 Battery leads

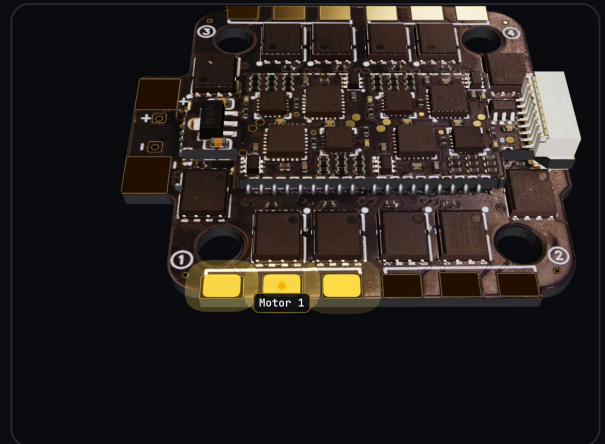
Solder the 12 AWG leads and the XT60 connector from the box to the same pads. Red to +, black to -. Check twice: reversed polarity is not covered by the warranty.

## Motor numbering

With the board this side up, motor 1 is bottom left, 2 bottom right, 3 top left and 4 top right, matching the numbers printed on the board. Each motor has three pads; swap any two of a motor's wires to reverse it (or reverse it in BLHeli/BlueJay).

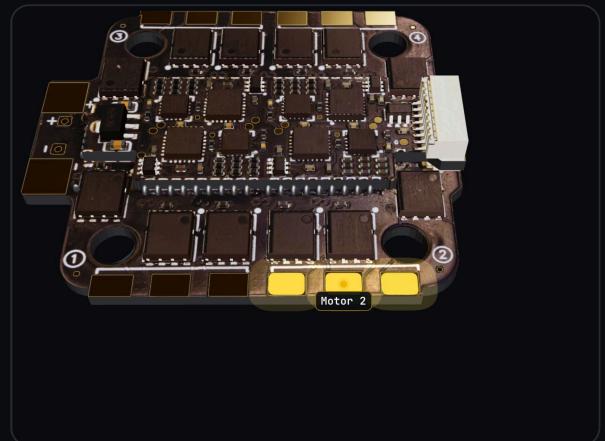
### 1 Motor 1

The three pads for motor 1.



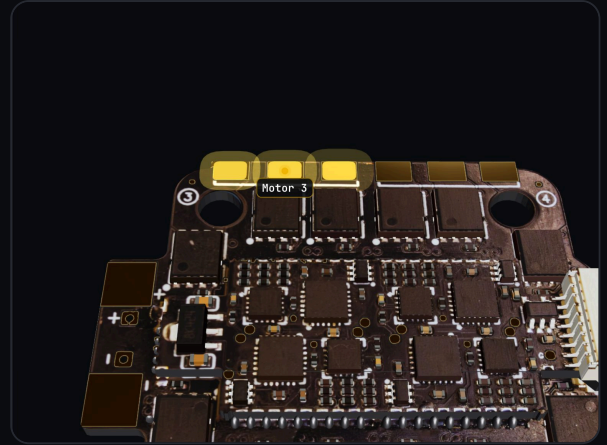
### 2 Motor 2

The three pads for motor 2.



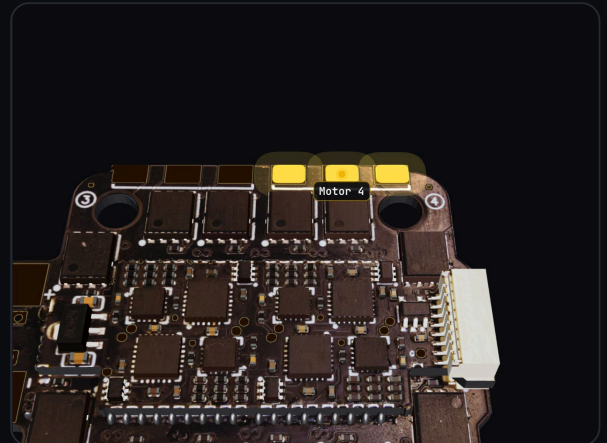
### 3 Motor 3

The three pads for motor 3.



### 4 Motor 4

The three pads for motor 4.

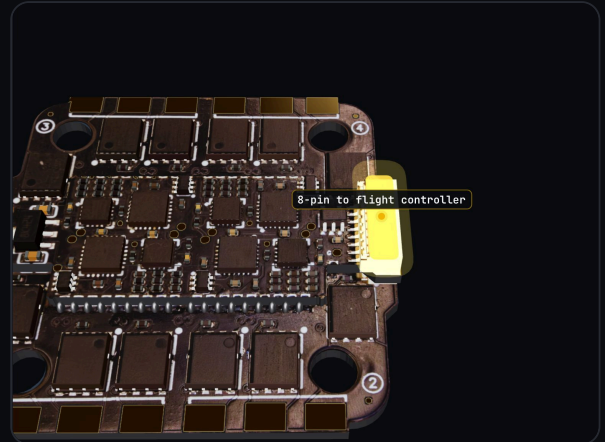


## Connect to the flight controller

Use the 8-pin cable from the box. It carries the four motor signals, current, telemetry, ground and battery voltage in one plug, straight into any Brahma. Or solder to the 7 pads on the underside (4, 3, 2, 1, C, G, V).

### 1 8-pin plug

Plug one end here and the other into the flight controller's ESC port.



### 2 Direct-solder pads

On the underside: 4, 3, 2, 1 (motor signals), C (current), G, V (battery voltage).



Stacks: [Stack H760](#), [Stack 760](#), [Stack 460](#).

## Before the first flight

- **First power-up through a smoke stopper** (or a current-limited bench supply). A solder bridge then costs you a fuse, not an ESC.
- **Bidirectional DShot:** with BlueJay on the ESC, use DShot300 and turn on bidirectional DShot in Betaflight (Configuration tab, or `set dshot_bidir = 0N`) and set your motor pole count ( `set motor_poles = 14` for most 5-inch motors). That enables the RPM filter, the biggest single improvement to a tune. Stock BLHeli\_S does not support it.
- **Motor order:** check it in the Motors tab with the props off. The flight controller expects its own motor order; if a motor spins in the wrong place, remap it rather than swapping wires around.

### IMPORTANT

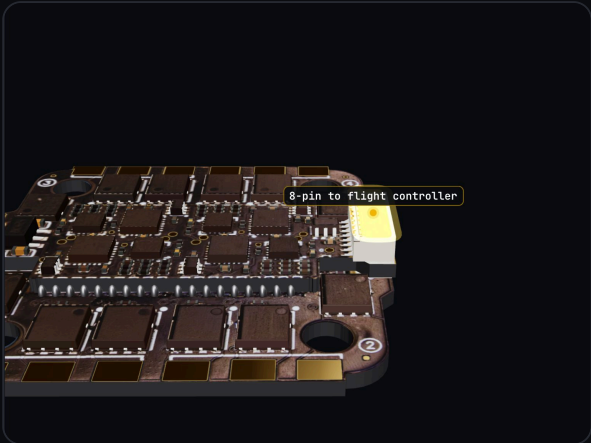
Test motor direction **without propellers** and keep it below 15% throttle. Never arm without propellers in Angle mode: the flight controller tries to level the craft and the motors will not slow down when you lower the throttle.

# BlueJay and PWM frequency

The Vishnu 60 ships with BLHeli\_S. For the RPM filter (bidirectional DShot) you need BlueJay.

## 1 Flash BlueJay

For RPM filtering (bidirectional DShot), flash BlueJay in the [ESC Configurator](#): target **J-H-50**.



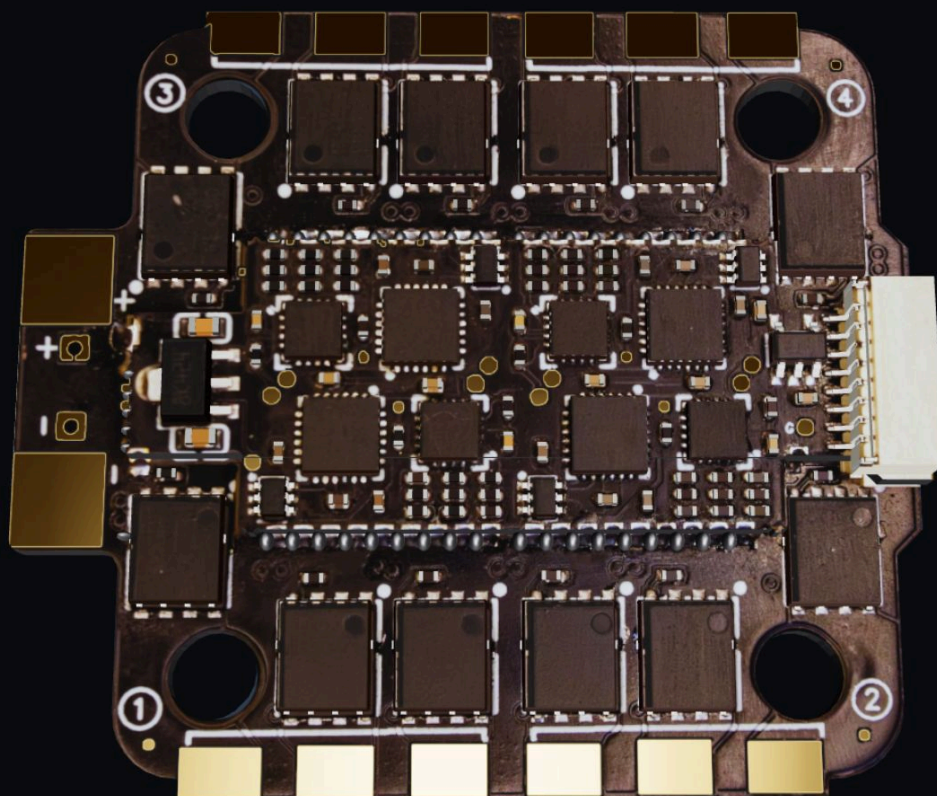
## 2 Set PWM by prop size

After flashing BlueJay, set PWM by prop size:

| Props           | PWM frequency |
|-----------------|---------------|
| Larger than 5"  | 24 kHz        |
| 5"              | 48 kHz        |
| Smaller than 5" | 96 kHz        |

A lower PWM frequency gives the motors firmer braking and keeps switching heat in the ESC down, which suits bigger props; it does not add thrust. A higher frequency runs the motors smoother and more efficiently at part throttle, which helps small motors most. If motors stutter, desync or will not start, flash again one step lower.

## In the box



- 1 × Vishnu 60 4-in-1 ESC
- 1 × 1000  $\mu$ F 35V low-ESR capacitor
- 12 AWG battery wire
- 1 × XT60 connector
- 1 × SH 1.0 mm 8-pin cable, 30 mm

## Downloads

### Vishnu 60 manual (PDF)

The original slide manual

## Warranty

The Vishnu 60 ESC has a 6-month warranty against manufacturing defects from the date of purchase. Keep your invoice: we need a copy for any claim.

### Not covered:

- Physical damage from use, such as water damage or tampered components.
- A burnt circuit from wrong wiring or overloading.
- A burnt ESC from spinning motors without propellers above 15% throttle while checking motor direction.
- A burnt ESC from arming without propellers in Angle mode: the flight controller keeps trying to level the craft and the motors will not slow down when you lower the throttle.

**How a claim works:** we inspect the board for physical damage and the points above. If it is eligible we replace it at no cost, and help you with your build. WhatsApp or call [+91 80171 93277](tel:+918017193277).