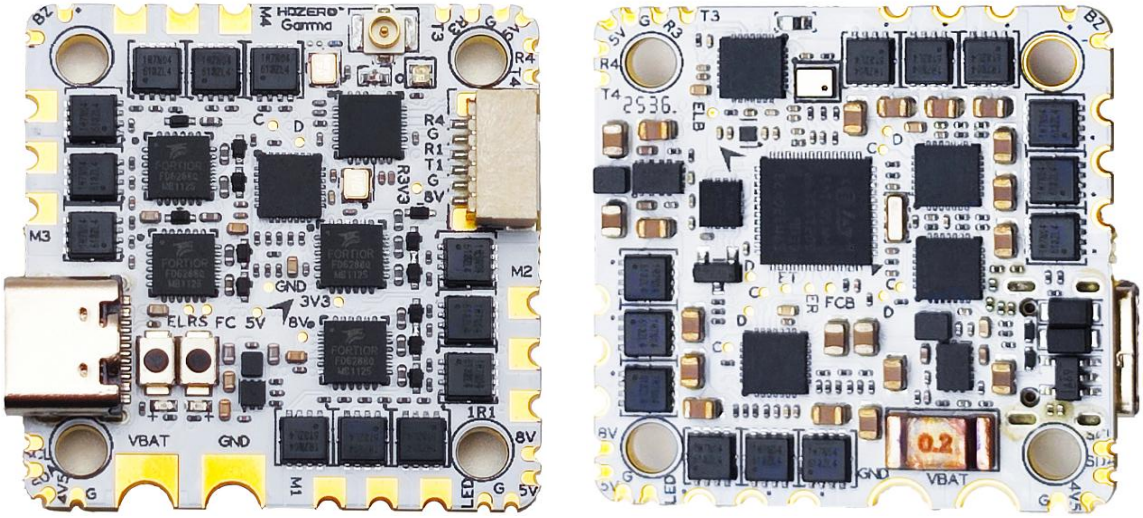
HDZero Gamma AIO Flight Controller

Introduction

The HDZero Gamma is a compact, high-performance flight controller built around the G473 MCU, delivering powerful computational capability. It comes with an integrated 2.4GHz ELRS receiver and dual BEC outputs—an 8V/3A line for video transmitters and a 5V/3A line for LEDs and peripherals—streamlining quad assembly by reducing external components.

At its core, the Gamma features a 4-in-1 ESC engineered to deliver exceptionally clean power to the MCU, shielding it from voltage spikes caused by rapid motor acceleration or deceleration. This protection minimizes the risk of brownouts or lockups, which are often responsible for burnt motors, failed MOSFETs, and catastrophic flight failures. Each motor is capable of sustaining 45A for 30 seconds, with peak bursts reaching 60A.

Purpose-built for drone soccer and digital FPV systems, the Gamma eliminates the analog OSD chip to save space and reduce costs. Optimized for pairing with the HDZero Whoop v2 VTX, it enables a low-profile stack ideal for competitive and lightweight builds.

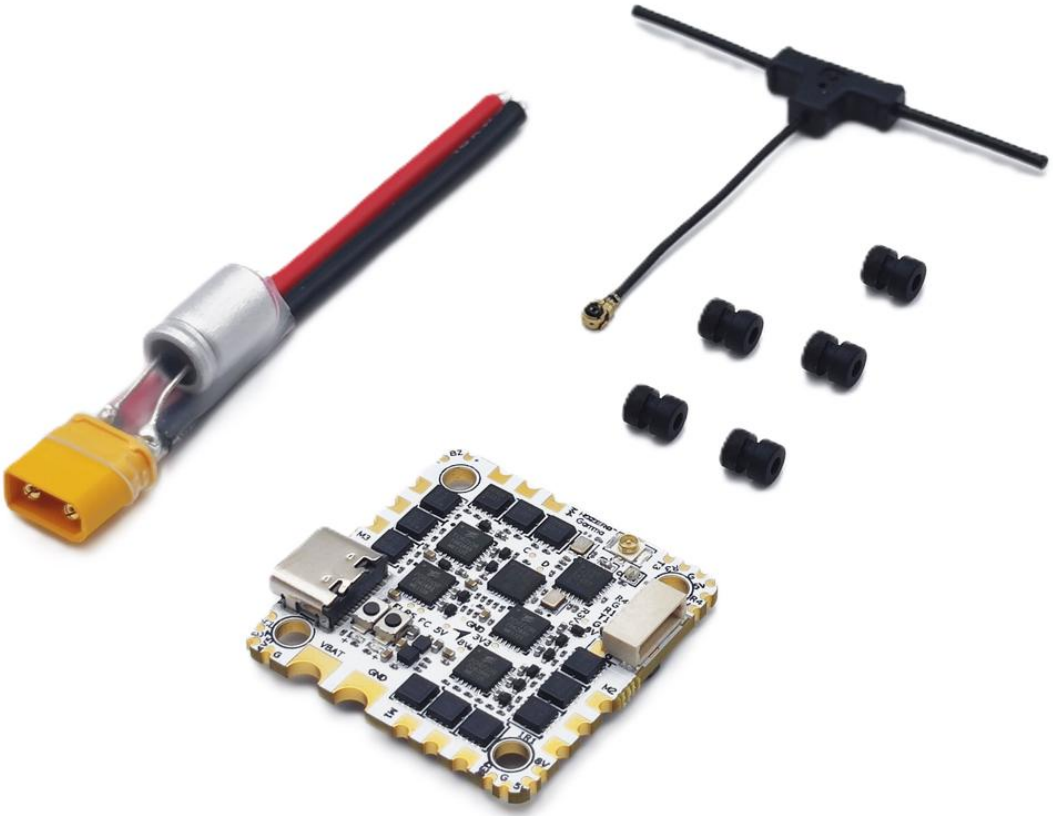


Specification

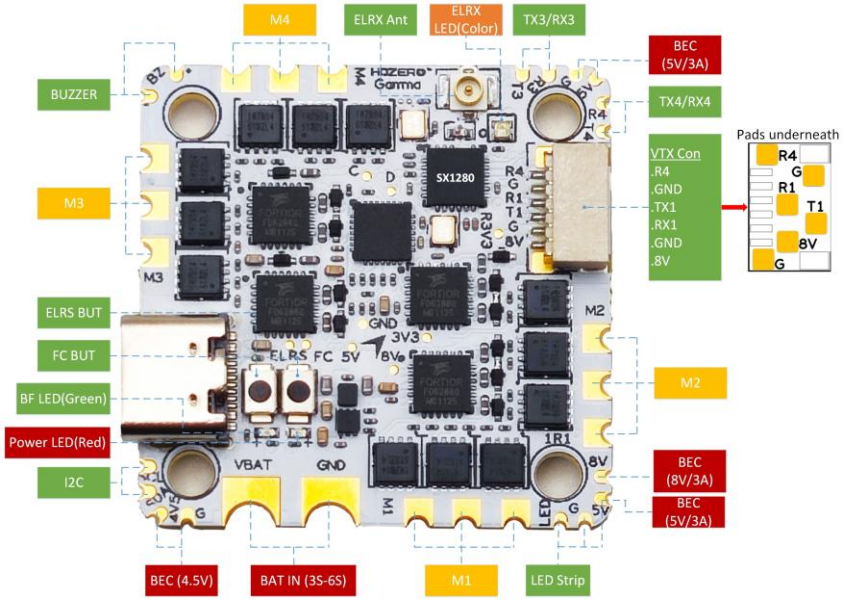
Model	HDZero Gamma AIO Flight Controller
Flight Controller	
CPU	STM32G473 (170MHz)
Gyro	ICM42688
Block Box	No
I2C Pads	Yes
UART Pads	TX1/RX1, TX3/RX3, TX4/RX4
ESC Telemetry	RX4
VTX MSP UART	TX1/RX1
Buzzer Pads	Yes
LED Strip Control	Yes
USB	Type-C
Analog OSD	No
FC Firmware	Betaflight: HDZERO_GAMMA
ESC	
CPU	AT32F421 (120MHz)
Telemetry	Supported
Input signal	Dshot 150/300/600, MultiShot, OneShot
Max Current	45Ax4 (Continuous) / 60Ax4 (Burst)
Current Sensor	Scale = 107, offset = 0
ESC Firmware	AM32 2.18 Target: AM32_HDZERO_HALO_F421_2.18.hex
ELRS Receiver	
Chip Set	ESP32 + SX1280
FC UART	TX2/RX2
RF Frequency	2.4GHz
Max TX RF Power	10mW
Antenna Interface	1x U.FL
ELRS Firmware	HDZero 2.4GHz | HDZero 2.4GHz AIO RX
BEC	
5V	3A for LED strips and other peripherals
8V	3A for digital video transmitter
Dimensions	
Power Supply	3S ~ 6S
Size	33x33mm with 25.5x25.5 M2 mounting holes
Weight	8.4g
Dedicated sockets for	ESC, and HDZero and other Digital VTXes

Includes

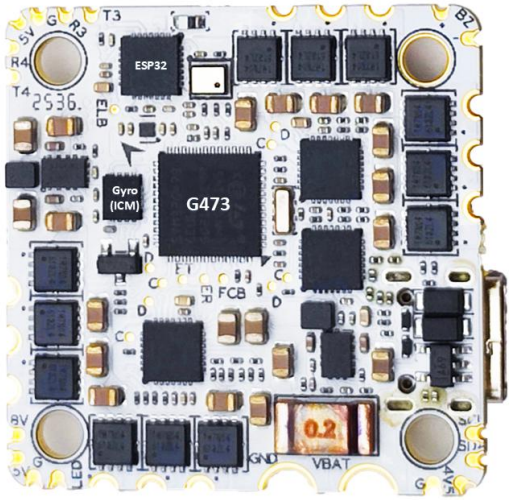
- 1x HDZero Gamma AIO
- 5x M2 Rubber Grommet(5.6mm)
- 1x ELRS T-sharp short antenna (40mm)
- 1x XT30 cable with 330uF/35V capacitor (70mm)



Diagram



Top view

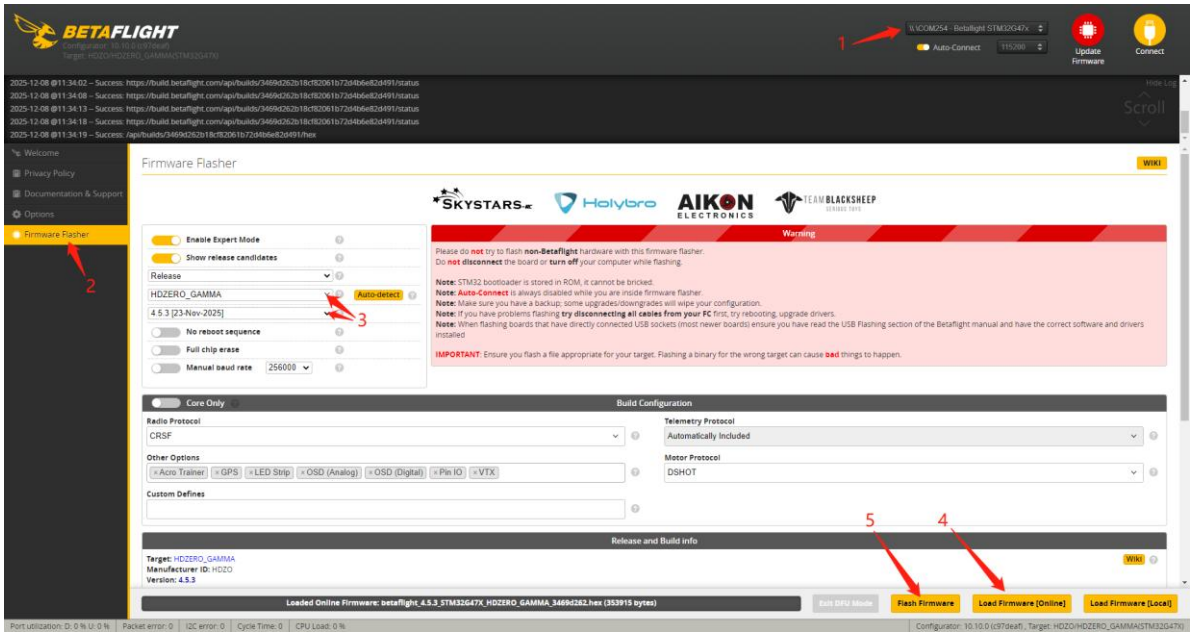


Bottom view

Firmware

1. Flash Betaflight firmware

- Download and install the Betaflight Configurator.
- Launch the Betaflight Configurator
- To flash firmware:



1) Select the target port
2) Click "Update Firmware" to enter Firmware Flasher tab
3) Select target "HAZERO_GAMMA" and version, The factory version is 4.5.3[23-Nov-2025]
4) Click "Load Firmware [Online] " to download the firmware
5) Click "Flash Firmware" to Flash the Flight controller

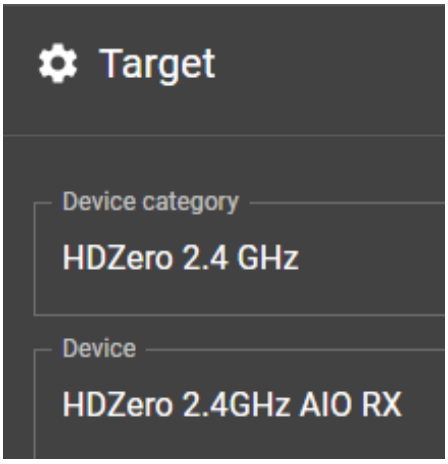
- DFU flash:
  If you have lost communication with your board follow these steps to restore communication:
  1) Power off Gamma
  2) Enable ‘No reboot sequence’, enable ‘Full chip erase’
  3) Hold FC BOOT button and Power on via USB-C into PC, then release BOOT button
  4) Install all STM32 drivers and Zadig if required (see USB Flashing section of Betaflight manual)
  5) Close Betaflight configurator, Restart Betaflight configurator
  6) Click "Update Firmware" to enter Firmware Flasher tab
  7) Select target " HAZERO_GAMMA " and version, The factory version is 4.5.3[23-Nov-2025]
  8) Click "Load Firmware [Online] " to download the firmware
  9) Click "Flash Firmware" to Flash the Flight controller

2. Flash ELRS firmware

The HDZero Gamma factory ELRS firmware version is Released 3.5.1, If you need to update the firmware, please refer to the ELRS update tutorials (Typical Updating Steps), and the Device Category and Device target are as follow:

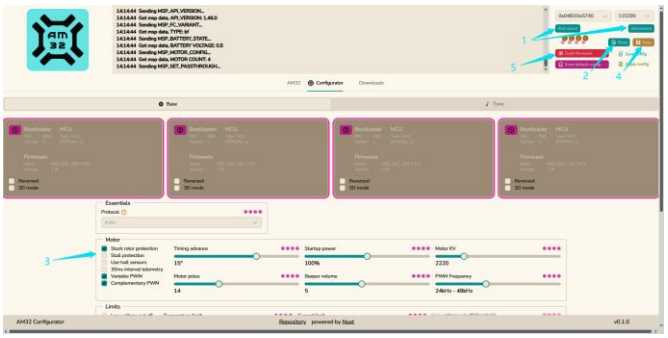
Device Category: HDZero 2.4GHz

Device target: HDZero 2.4GHz AIO RX



3. Flash ESC firmware (AM32)

a) Remove all propellers from the drone that Gamma AIO is correctly installed
b) Power on the drone, and connect the Gamma to PC via USB
c) Open the AM32 Configurator: http://am32.ca
d) Click Port Select and Connect, then Read.
e) Adjust parameters as needed, then Save.



If needed, click [Flash firmware] to update the ESC firmware