HDZero AIO5 is the world's first digital video AIO, enabling bind and fly 65mm whoops to weigh less than 19.5g. AIO5 integrates a F4 flight controller, HDZero 5.8GHz digital video transmitter, SPI 2.4GHz ExpressLRS 3.0 receiver, DSHOT protocol 4-in-1 ESC, and a 5V/1A BEC. It is ideal for tiny whoop racing and freestyle.
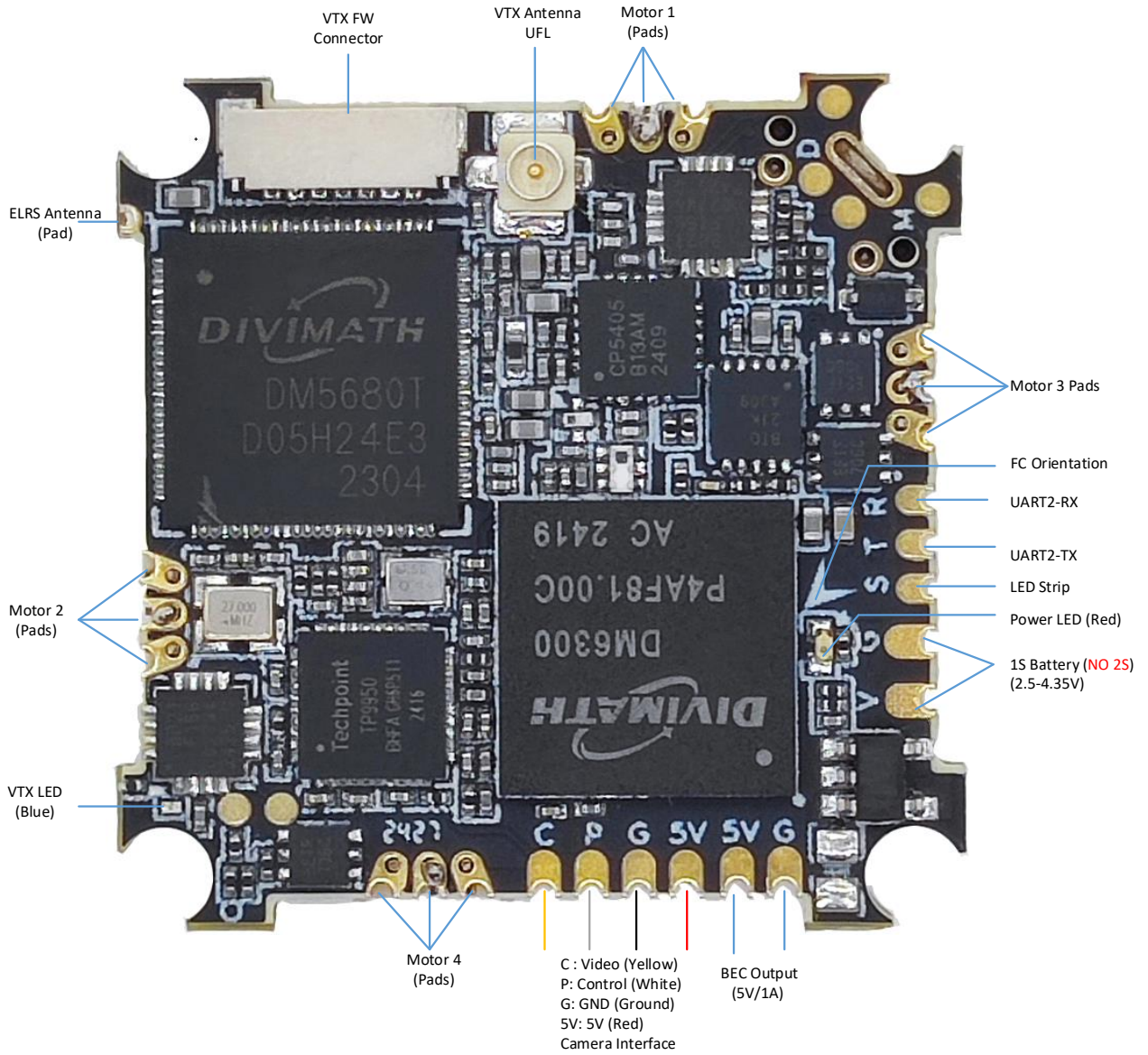
The HDZero AIO5 is an excellent collaboration between Happymodel and HDZero. It is available at major FPV resellers worldwide, and also at Happymodel and HDZero official online shops.
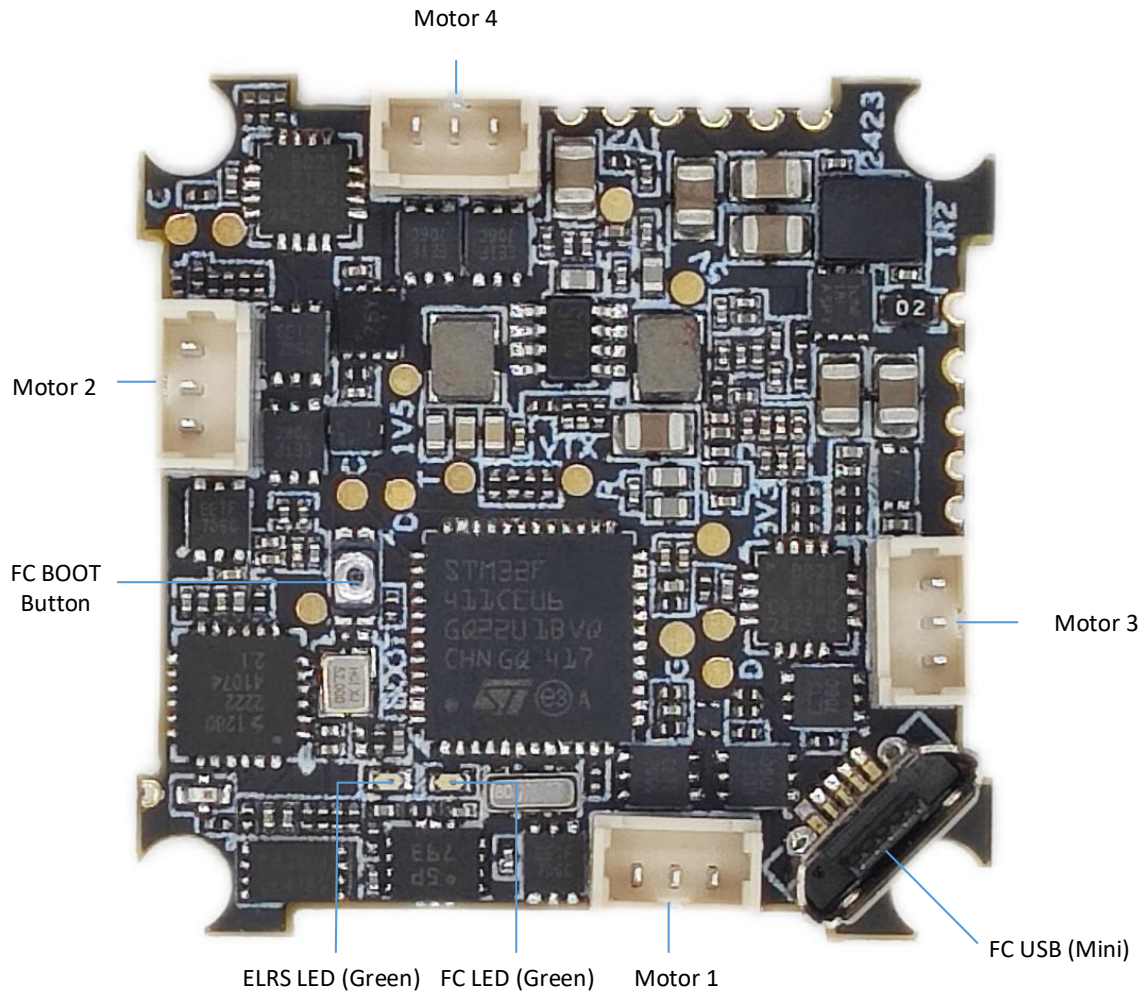
Specifications

- MCU: STM32F411 (100MHz, 512K Flash)

- Gyro: BMI270

- On board voltage and amperage meters

- Built-in 5A(each) BLHeli_S 4-in-1 ESC

    o MCU: EFM8BB21

    o HV Current: 5A continuous peak 6A (3 seconds)

    o Factory firmware: O_H_5_48_V0.19.2.HEX

    o Dshot600 ready

- Built-in 5.8G HDZero VTX

    o RF output: 25mw/200mW

    o Supported channels: R1-R8, F2/F4, L1-L8

    o UFL connector (ultra-lite linear antenna included)

- Built-in SPI ExpressLRS 2.4GHz receiver

    o Packet rate option: 25Hz/50Hz/150Hz/250Hz/500Hz

    o Pre-soldered enamel wire antenna

    o Telemetry output power: <12dBm

- Built-in 5V 1A BEC

- Flight controller firmware target: CRAZYBEEF4SX1280, configuration file??

- Power supply: 1S battery (2.5V – 4.35V)

- Fully compatible with the popular whoop frames

    o Board size:28.5x28.5mm with a 25.5x25.5 mounting hole size

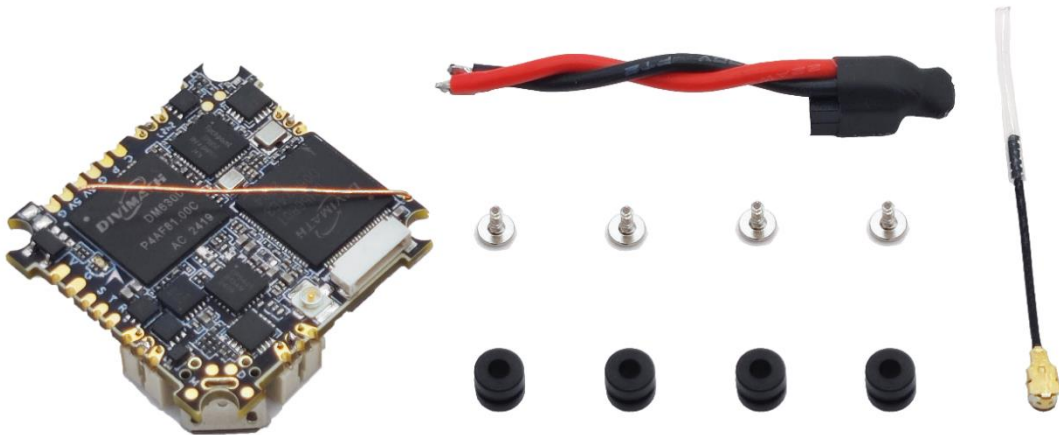- Weight: 5.7g(without motor plugs), 6.3g (with motor plugs)

Diagram

TOP

VTX FW Connector

VTX Antenna UFL

Motor 1 (Pads)

ELRS Antenna (Pad)

Motor 3 Pads

FC Orientation

UART2-RX

UART2-TX

LED Strip

Motor 2 (Pads)

Power LED (Red)

1S Battery (NO 2S) (2.5-4.35V)

VTX LED (Blue)

Motor 4 (Pads)

C : Video (Yellow)
P: Control (White)
G: GND (Ground)
5V: 5V (Red)
Camera Interface

BEC Output (5V/1A)

Bottom

Motor 4

Motor 2

FC BOOT
Button

Motor 3

Motor 1

FC USB (Mini)

ELRS LED (Green)   FC LED (Green)   Motor 1

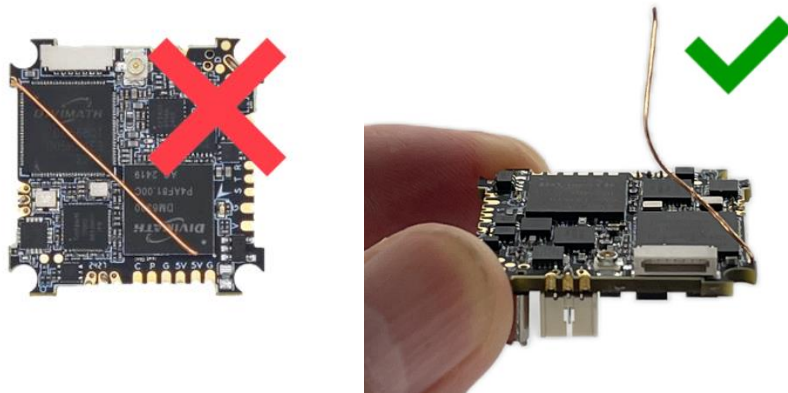*Motor plugs are exclusively available on retail boards.*

Included

- 1x HDZero AIO5 board

- 1x Power cable with inverted angle A30 connector

- 4x screws

- 4x rubber grommets

- 1x ultra-lite linear VTX antenna
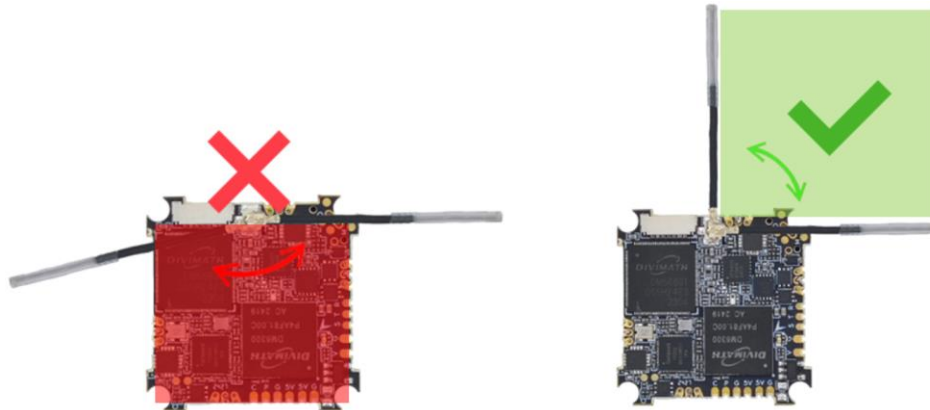
Installation Notes

ELRS antenna

A line antenna (¼ wavelength) for the ELRS receiver is pre-soldered and positioned close to the board for low-profile and easy packaging. However, **the ELRS antenna needs to be lifted to maintain at least 3 mm of clearance from the board**.

VTX antenna

The HDZero VTX integrated into the AIO5 has a specific requirement to prevent video noise caused by the video RF signal being routed back to the onboard power amplifier.

The VTX antenna should be mounted outward, not inward, on the board.

Bind with TX radio

There are two ways to configure AIO for binding:

1. Connect HDZero AIO5 to PC via micro-USB. Open Betaflight and connect to the AIO. Navigate to the "Receiver" tab and click "Bind" to initiate binding mode; or

2. Power the HDZero AIO5 (either via USB to PC or a 1S battery). Wait until the ELRS LED turns off, then immediately turn off the power (unplug the USB or battery). Repeat these steps once more. When the RX is powered on for the third time, the LED will start to double-flash, indicating that the RX has entered binding mode.

Once RX is in binding mode, insert the ELRS TX module into your OpenTX Radio transmitter, select External RF mode and set it to the CRSF protocol. You will find the ELRS menu in the Radio system (ensure the ELRS.LUA file is copied to the SD-Card tools first). Enter the ELRS menu and press [Bind]. The RX LED on the flight controller will become solid if the binding is successful.
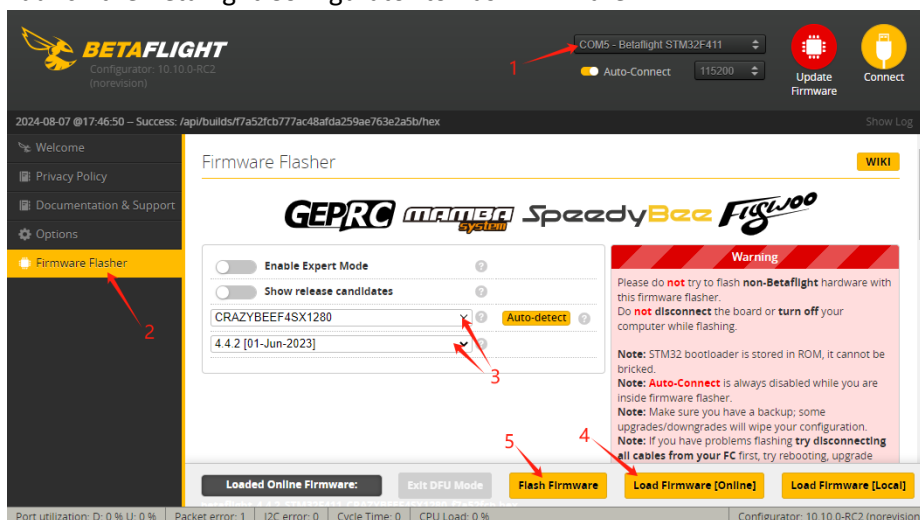
NOTE: Make sure you use the matching ELRS preset for your link rate, failure to do so can lead to un-commanded movement in turns.

ELRS LED status:

❖ **Solid** means bind successful or Connection established;
❖ **Double-flash** means in bind mode;
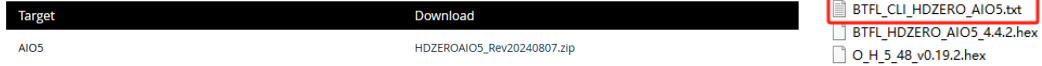❖ **Flash slowly** means no signal established with the TX module

Firmware

1. Betaflight firmware and CLI
   - Download and install the Betaflight Configurator.

   - Launch the Betaflight Configurator to flash firmware.
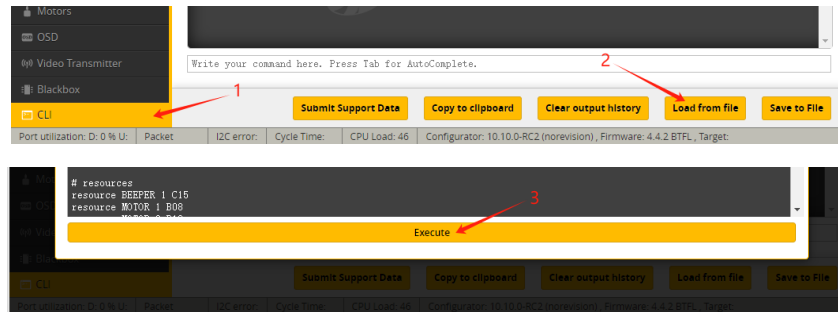

   1. Select the target port

2. Click "Update Firmware" to enter Firmware Flasher tab

3. Select target "CRAZYBEEF4SX1280" and version, The factory version is 4.4.2[01-Jun-2023]

4. Click "Load Firmware[Online] " to download the firmware

5. Click "Flash Firmware" to Flash the Flight controller

- Download the CLI file from https://www.hd-zero.com/document

- Select the target port and connect on the Betaflight Configurator.

- Execute CLI from file

  1. Switch to CLI tab

  2. Load from file BTFL_CLI_HDZERO AIO5.txt

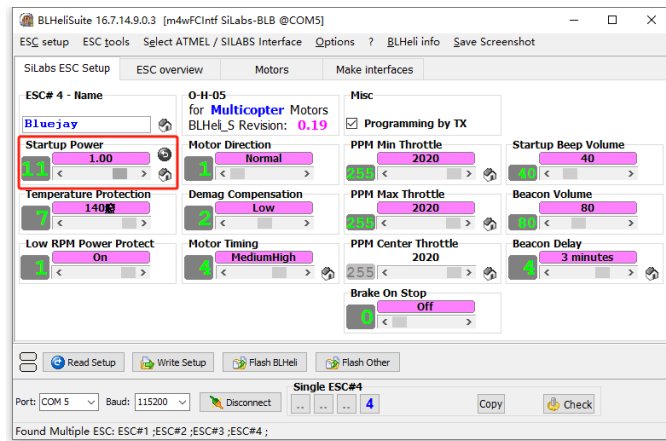 3. Execute

2. BlueJay ESC firmware

The factory firmware:
O_H_5_48_V0.19.2.HEX. To flash a new ESC firmware, here is a YouTube tutorial.

Before flashing the firmware, please turn off the remote controller to disconnect the ELRS.

After flashing firmware, it is needed to set the Startup Power of each ESC to 1.00 through BLHeliSuite 16.7.14.9.0.3

Please note that heat dissipation and full charged battery are needed for flashing ESC firmware.

3. HDZero firmware

- Purchase [a HDZero VTX Programmer](#) if you don't have one;

- Download *HDZero Programmer* application from https://www.hd-zero.com/document

Utilities

Utilities	Download	Note
Unlock_Lowband*	Unlock_Lowband.zip	Make sure your region allows low band before download.
HDZero Programmer	HDZero Programmer.zip	
Phoenix Card	PhoenixCard.zip	
VTX_Table	VTX_Table.zip	

- Plug the HDZero VTX Programmer into AIO5's VTX FW Connector. And use the USBC cable to connect the programmer tool and PC

- Launch the *HDZeroProgrammer.exe* on a Windows PC

  1. Select the AIO5

  2. Click "Load Online Firmware" and select the version number

  3. Click "Flash VTX". "Connecting VTX ..." will be displayed at the bottom

The application will automatically download the firmware and flash it.