

Orqa **FC2020-F722HD**

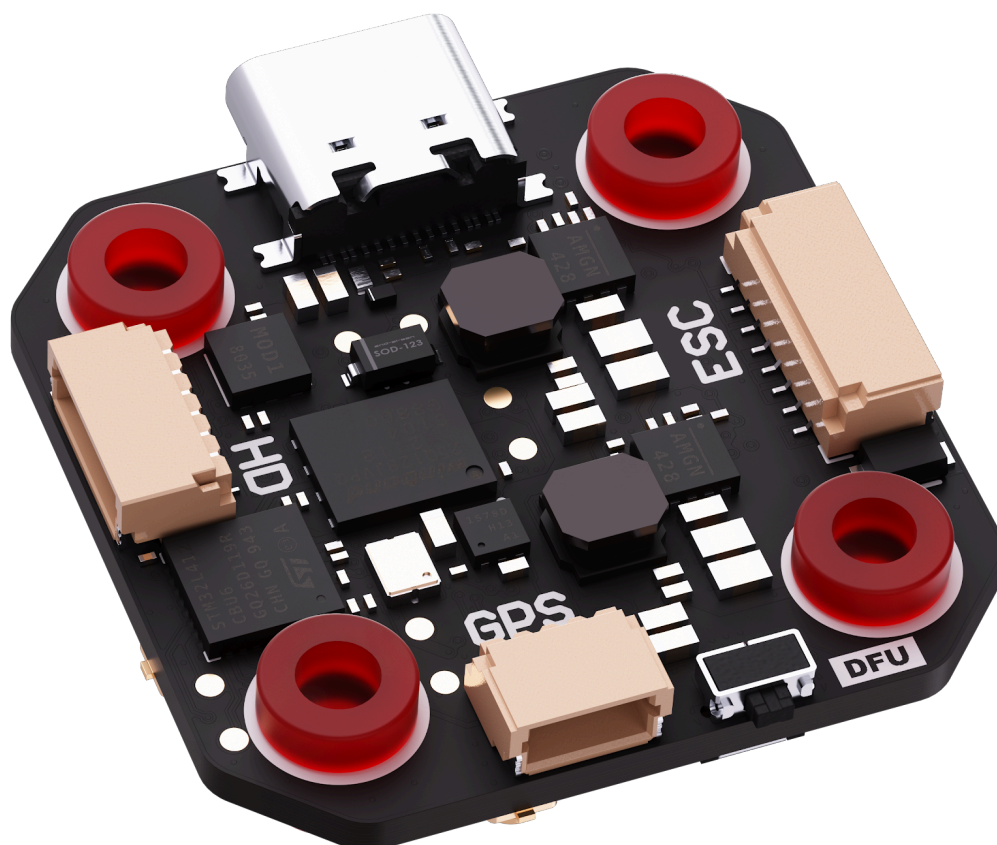
FOR DIGITAL VIDEO SYSTEMS

Users Manual

July 2024 : Version 1.1



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Specifications

- **Full NDAA Compliance**, designed and manufactured 100% in the EU
- **STM32F722** processor
- **20x20 Mounting Holes** (Softmount Gummies Included)
- **Betaflight** and **iNav** support
- **MPU-6000** gyro
- **Dual, Independent Ghost** Receivers on-board
- **Locking** U.FL Antenna connectors
- **Digital vTx Support** for HDZero, DJI etc (Connector Interface)
- **JST-SH** connectors for ESC, VTX, Cam and GPS
- **USB-C** connector
- Onboard **barometric altimeter**
- Twin **2A** switching regulators (5V and 10V)
- **16MByte** serial flash memory
- **4** Motor Outputs
- **2s-6s** Lipo Support

Overview

The Orqa 2020 F722 is a NDAA-Compliant Flight Controller designed for commercial use.

This FC has been thoroughly designed and tested for Racing purposes. Connectors allow for easy and fast maintenance on the field, and its conception has been thought for hardcore racing and high performance quadcopters.

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Hardware

In the Box

Box includes everything you need to get yourself in the air with the Orqa FC2020 HD.

QTY	Item	Comment
5	M3 Gummies Short, Red	Flight Controller Soft Mount
5	M3 Gummies Long, Red	Flight Controller Soft Mount
5	M3 Hex nut, Metal, Black	Mounting Nuts
5	M3 Hex nut, Nylon, Black	Mounting Nuts - Alternative Option
4	M3x20 Hex Button Head screws	Stack screws
5	M3 Rubber Washer (black)	Spacers
1	JST-SHR 8 pin to JST-SHR 8 pin	Flight Controller to ESC Cable (Standard)
1	JST-SHR 4 pin to JST SHR 4pin	Flight Controller to GPS Cable
1	JST-SHR 4 pin to open JST terminals	Flight Controller to GPS Universal Cable
1	JST-SHR 6pin to Open Tinned Wires	Flight Controller to VTX Universal Cable
2	Ghost 2.4Ghz Antenna	Qt Ghost Antenna for Integrated Rx



Note that this is only for the Flight Controller, the ESC is also shipped with its own set of gummies, nuts and connectors.

“Universal Cables” are shipped with Connectors on the FC Side, and Open Terminals/Tinned wires on the other for **maximum compatibility with other components.**

You can simply solder or repin your own connector depending on the peripherals you’re using.

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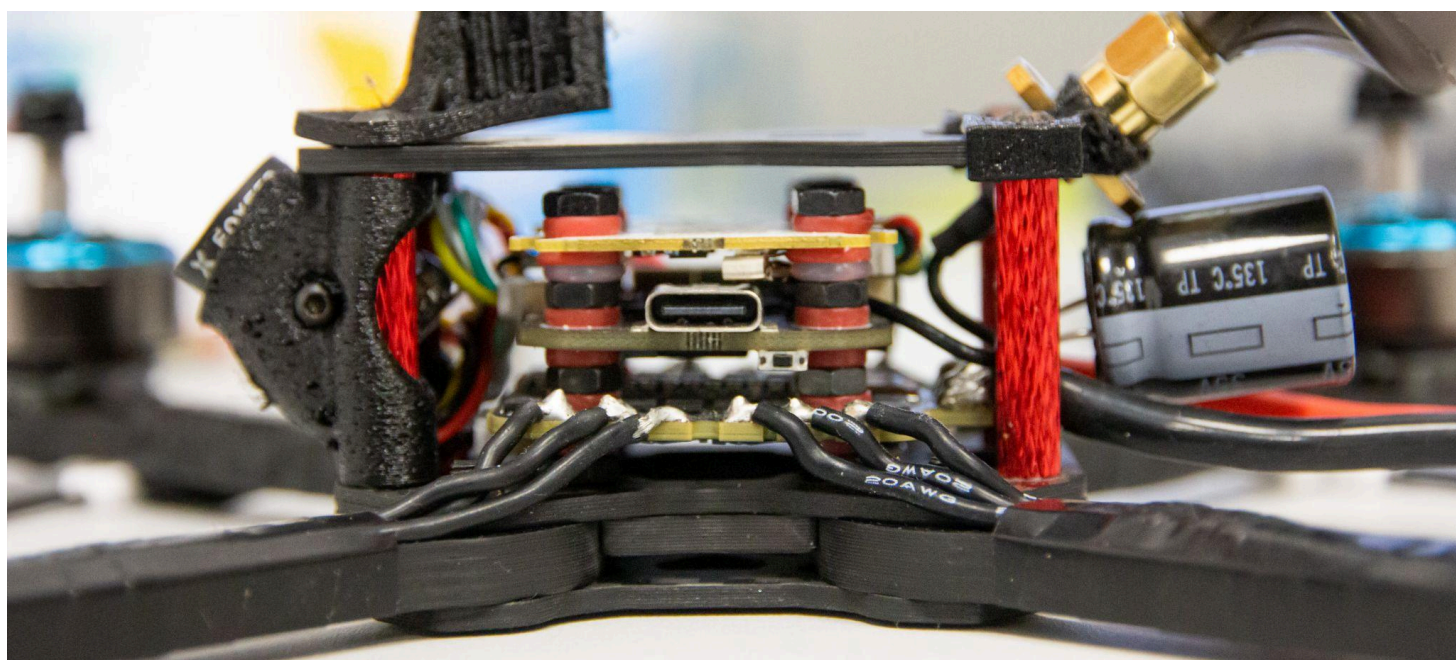
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Mounting Options

The FC ships with **soft silicone rubber 'gummies'** that should be used to **mount the FC onto the 'stack'**. These gummies not only reduce sensor noise caused by props, but also play an important role in protecting the delicate sensors from extreme shock.



Standard Mounting example in a Five33 Switchback Frame.

Different gummies height are provided as well as a few spacers and nuts, feel free to play around and find the best way to mount it depending on your setup and your needs !

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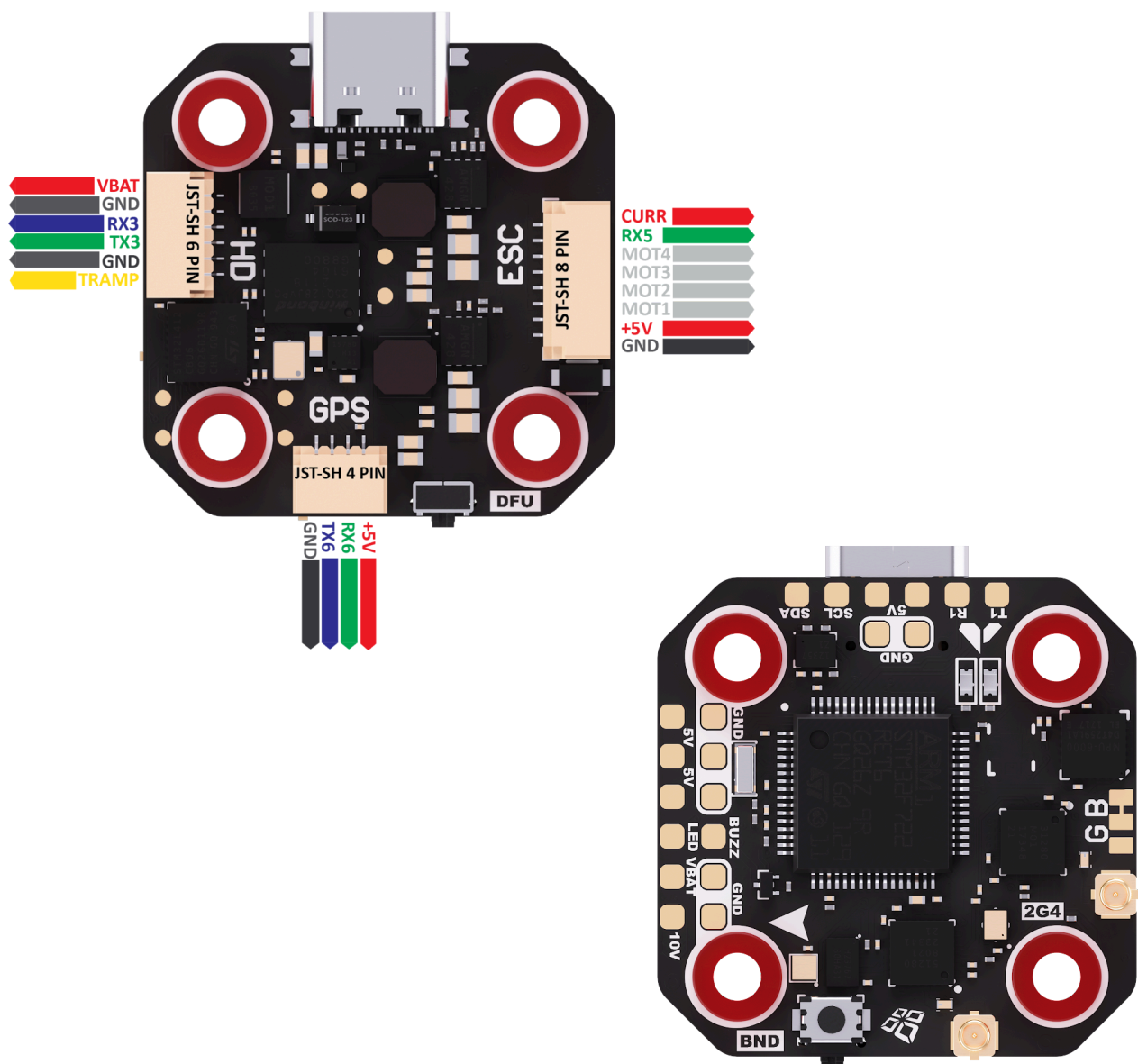


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Connectors and Pinouts

The Orqa FC2020-F722 FC comes with **both connectors and soldering pads options** to be used according to your needs.

Cables with their corresponding connectors for every peripheral are included with it for easy installation.



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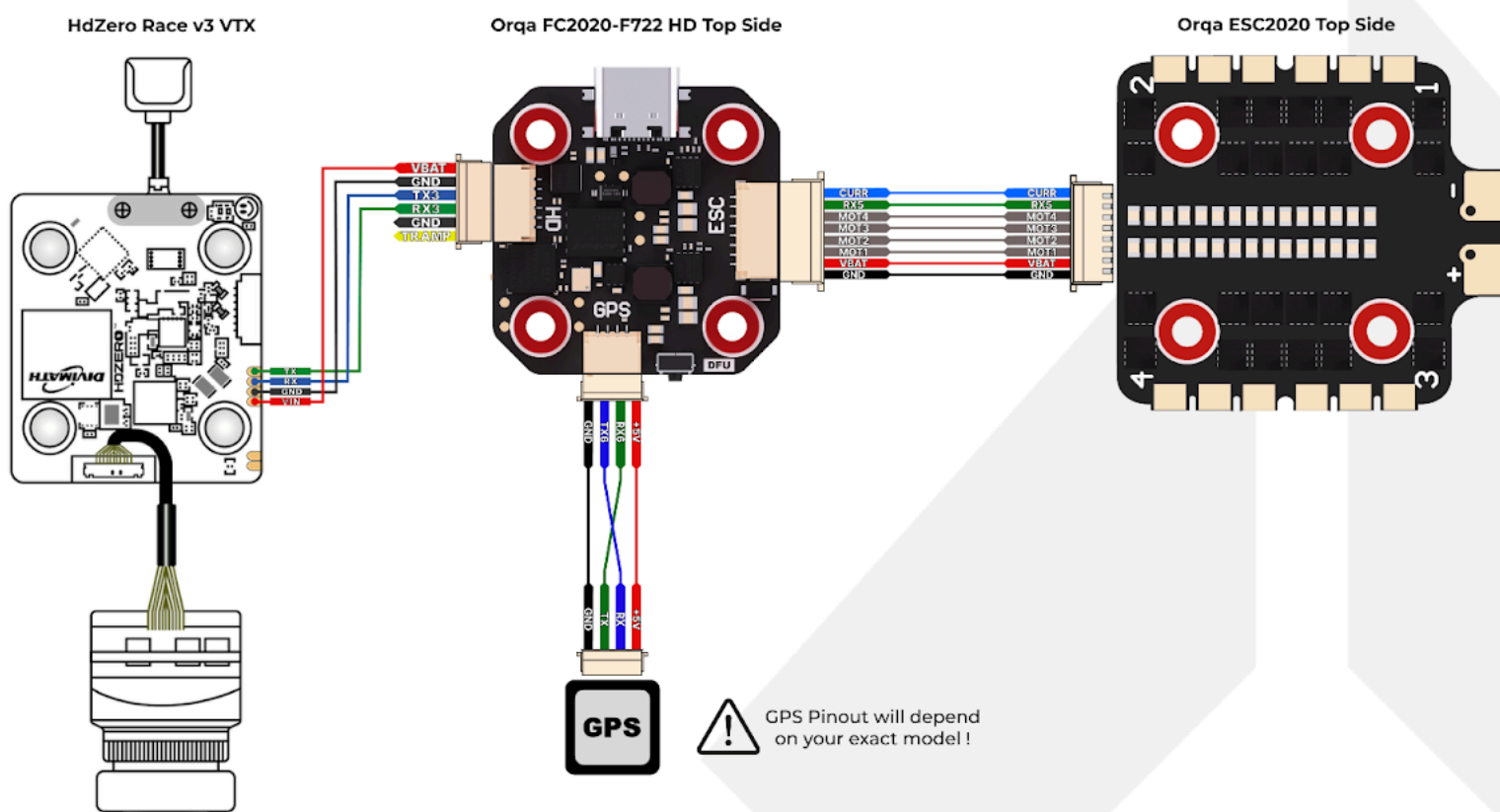


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Wiring Diagrams

Digital VTX Setup

The following diagram displays an HdZero Race v3 VTX but the wiring on the FC Side will be the same, with the included connector, for any other digital Video Transmitter.



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Built-in dual ghost receivers

The 2020 FC includes a **built-in dual Ghost receiver** that is equivalent to an Atto duo. It is updated over the air like all Ghost receivers. It is connected internally to **TX4**.

Note: Make sure to use two antennas when flying for best performance.

Binding to your transmitter

The binding procedure is **the exact same than any other Ghost Receiver**, here's an extract from the [official ghost manual](#) :

New Flight Controller

- New Receivers are shipped with bind mode enabled. For new receivers, just power them on, power up the Tx, enter the Binding menu, and start the bind sequence.
- The Rx LED will be blue when in bind mode.
- The Tx will show the binding confirmation, if successful, with the ID of the receiver, and the firmware version installed on it.

Note: To prevent surprises if the bind button is pressed during flight, the bind button is deactivated 30 seconds after the Rx is powered up. Simply cycle Rx power to re-enable if bind was intentional.

Deja Vu Binding

Deja Vu Binding records all receivers used by a Ghost transmitter and can bind to them in the future without the need to touch the bind button on the receiver.

Receivers, after powered on, and before they have a valid connection to a Ghost transmitter, periodically scan for transmitters attempting to bind.

This feature also enables the Ghost Updater to transfer firmware updates only for receivers that you own.

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Firmware

Firmware compatibility

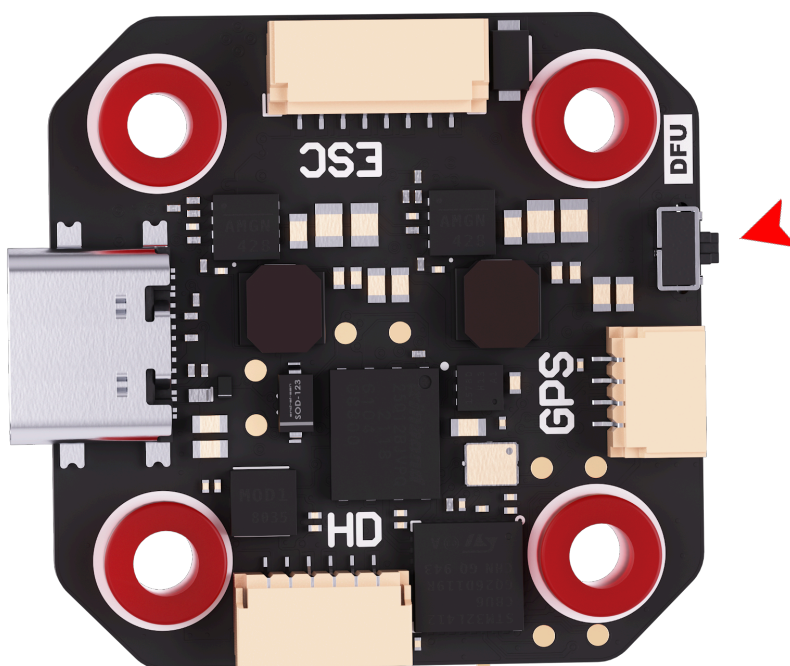
Two firmware options are available for the FC, and firmware images may be downloaded from our web site :

Firmware	Type	Status
Betaflight	Open Source	Production Ready
iNav	Open Source	Experimental

The FC ships pre-flashed on Betaflight with stock settings.

Firmware Installation, and DFU Mode

The Orqa FC includes a standard STMicroelectronics DFU Bootloader, which may be accessed by applying power to the board with the small button beside the USB port pressed.



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Voltage and Current Sensor

These values depend primarily on the ESC used. If the Orqa 2020 ESC is used, the default values programmed will be correct.

If a different ESC is used, there are several online guides explaining how to calibrate voltage, and current.

Voltage

The voltage divider used in the FC has a 10/1.2 ratio, and may be configured in betaflight as follows, with a scale of **112**, divider of **1**, and multiplier of **12**.

112	▲▼	Scale
1	▲▼	Divider Value
12	▲▼	Multiplier Value

Current

The FC feeds the **CURR** input from the 8-pin connector directly into the **ADC input**.

Values of **108** for the scale, and **0** for the offset are a good starting point. but if an extremely precise calibration is required, recent versions of Betaflight Configurator have a built-in calibration procedure, started with the **Calibration** button at the bottom of the Power & Battery page.

108	▲▼	Scale [1/10th mV/A]
0	▲▼	Offset [mA]

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Troubleshooting

Support

For technical support, please use our Help Desk at the following link:

<https://orqafpv.freshdesk.com/>