



# **USER MANUAL**

VERSION 1.0 01/07/2024

WARP F7

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### 1. Product Description

The ZERODRAG WARP F7 is a cutting-edge flight controller designed for UAVs. It offers advanced capabilities with robust performance powered by the STM32F722 microcontroller, two gyro options (ICM42688P and MPU6000), and an integrated BMP280 barometer. The controller supports a wide range of power inputs (3-6S LiPo) and features a compact form factor (37mm x 38.5mm x 7.1mm), making it an ideal choice for high-precision flight operations.

Enhanced with an AT7456E OSD chip, 32MB BlackBox-Flash for flight data logging, and multiple BEC outputs, the ZERODRAG WARP F7 ensures comprehensive functionality for various UAV applications. Its connectivity options include up to 6 UARTs, up to 8 Motor outputs, and I2C pads for additional sensors. The flight controller is optimized for Betaflight firmware and compatible with iNav, providing seamless integration and easy configuration for all your UAV needs.

### 2. Specification

ZERODRAG WARP F7 Flight Controller

- Product Name: ZERODRAG WARP F7
- Power Input: 3-6S LiPo
- **Mounting:** 30.5 x 30.5mm (4mm hole size)
- **Dimension:** 37 x 38.5 x 7.1 mm
- Weight: 9.35g
- MCU: STM32F722
- GYRO (IMU): ICM42688P / MPU6000
- Barometer: BMP280
- **OSD Chip:** AT7456E
- USB Port: Type-C
- BlackBox-Flash: 32MB
- Camera Control: Pad
- **5V Bec:** 3 Amp
- **10V Bec:** 2.5 Amp
- **3.3V Regulator:** 500 mA
- USB 4.5V: For Receiver and GPS module
- ESC Signal Pads: M1 M6 on top side and M7-M8 as T6 & R6
- UARTs: 6 UARTs with 6 motor pads / 5 UARTs with 8 motor pads



### **ZERODR/**G

- **I2C Pads:** SDA & SCL Pads for sensors like Magnetometer, Sonar, etc.
- Buzzer: Used for 5V Buzzer
- 5 x LED Pad: Supported by Betaflight firmware
- RSSI: RSI on the pad
- Supported Firmware: Betaflight and iNav
- Target Name: ZeroDrag WARP F7
- **BOOT Button:** Press boot button, then power FC to activate DFU mode for flashing.
- Connector: BetaFlight Standard



1.6mm



38.5mm

### 3. In The Box



WARP F7

### 4. Layout





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### **LED Indication**

**ORANGE LED 1** - Sensor 3.3 Voltage indication

BLUE LED - FC Status Light.

Unlit: USB disconnected and disarmed,

Lit: USB disconnected and armed,

Flashing: USB connected and disarmed,

**5x Rapid Flash then Flashing:** USB connected and arming command prevented **GREEN LED** - FC Status Light

**ORANGE LED 2** - 5V Power Indicator.

**RED LED** - 10V Power Indicator.

### 5. Connections

### Method 1 - Direct Soldering



FC-ESC



FC-CAM



FC-VTX



FC-Caddx Vista



FC-DJI AirUnit





FC-DJI 03



FC-GPS



**FC-ELRS/CRSF Receiver** 





FC-Spectrum







FC-LED's/Buzzer



### Method 2 - Direct Connector wiring.



FC-ESC



FC-CAM



FC-VTX









FC-GPS



FC-4pin LED's



FC-Standard LED's

WARP F7

#### **LED Connection Options:**

You have two options for connecting LEDs to your flight controller:

#### 1. Soldering:

• Use the three solder pads: 5V, Ground, and Signal.

#### 2. Connector:

•Use the 4-pin connector with pins for 5V, Ground, Signal In, and Signal Out.

#### Daisy Chain Feature:

• By default, the connectors are daisy-chained, meaning each connector can control LEDs independently.

• If you prefer to use standard LEDs and control all connectors simultaneously, follow these steps:

#### Steps to Use Standard LEDs in Parallel:

- 1. On each of the three connectors (except the first one), cut the Signal Out wire.
- 2. Bridge the small pad next to the Signal pad on the flight controller.
- 3. This will set all connectors to use the same signal, allowing them to operate in parallel.

#### Important:

• You only need to do this on three connectors, as the first connector already provides the signal.



Avoid Sbus or RX use with DJI or Vice versa.



When using an SBUS receiver, connect its SBUS signal wire to the SBUS pad on the front side of the flight controller, utilizing UART2 internally. If employing the DJI Air Unit (03/Link/Vista/Air Unit V1), disconnect the SBUS signal wire from the Air Unit harness to ensure proper recognition by the flight controller. Use tweezers to remove or cut this wire from the 6-pin harness connector, and insulate the exposed part meticulously. Similarly, when utilizing ELRS receivers, connect their TX and RX to the T2 and R2 pads on the flight controller. However, in case of recognition issues with ELRS receivers when using the DJI Air Unit simultaneously, repeat the process of disconnecting the SBUS signal wire from the Air Unit harness to resolve the issue.







### 6. Firmware Update

#### Step-by-Step Guide to Flash WARP F7 Firmware in Betaflight

#### **Requirements:**

- 1. WARP F7 Flight Controller
- 2. USB Type-C Cable
- 3. Computer with Betaflight Configurator installed
- 4. WARP F7 Firmware file

#### Step 1: Install Betaflight Configurator

1. Download and install the Betaflight Configurator from the official Betaflight GitHub repository.





#### Step 2: Connect the Flight Controller

- 1. Use a USB Type-C cable to connect the WARP F7 flight controller to your computer.
- 2. Open Betaflight Configurator.

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#### Step 3: Enter Bootloader Mode

- 1. Locate the **BOOT** button on the WARP F7 flight controller.
- 2. Press and hold the BOOT button, then connect the USB cable to power up the flight controller. This will put the flight controller in DFU (Device Firmware Upgrade) mode.





#### Step 4: Select DFU Mode in Betaflight Configurator

1. In the Betaflight Configurator, look for the **"Manual Bootloader (DFU)"** option under the **"Ports"** section.



2. Ensure the configurator recognizes the flight controller in DFU mode (you should see "DFU" in the top right corner).





#### Step 5: Load Firmware

- 1. Go to the **"Firmware Flasher"** tab in Betaflight Configurator.
- 2. Under "Choose a board", select "WARP F7".
- 3. Under "Choose a firmware version", select the desired firmware version.
- 4. Enable the option **"Full chip erase"** to ensure a clean installation.
- 5. Click on **"Load Firmware (Online)"** to download the firmware from the internet, or **"Load Firmware (Local)"** if you have the firmware file saved on your computer.

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#### Step 6: Flash Firmware

- 1. Once the firmware is loaded, click on "Flash Firmware".
- 2. The flashing process will begin, and you will see a progress bar indicating the status.
- 3. Wait for the flashing process to complete. You will see a confirmation message once it's done.



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#### Step 7: Reconnect and Configure

- 1. After flashing, disconnect and reconnect the USB cable to restart the flight controller.
- 2. Betaflight Configurator should now recognize the WARP F7 flight controller.
- 3. Proceed with the initial setup and configuration of your flight controller in Betaflight.

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	Download Hetaflight Blackbox Log Viewer	<ul> <li>using your knowledge or becaught to create or update content on our www, or answering other users' questions in drame forums;</li> <li>contributing code to the firmware and Configurator - new features, fixes, improvements;</li> </ul>	If you found the Betafight or Betafight Configurator useful, please consider supporting its development by donating.
	Download Betaflight TX Lua Scripts	<ul> <li>testing new features and fixes and providing feedback;</li> </ul>	- Davate
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	For legacy hardware using a CP210x USB to serial chip:		
	The latest CP210x Drivers can be downloaded from here The latest Zedig for Windows USB driver installation can be downloaded from here		
	ImpulseRC Driver Fixer can be downloaded here		
	We also have a Facebook Group. join us to get a place to talk about Betaflight, ask configuration questions, or just hang out with follow pliots.		
	Betaflight Oliscord Server. Share your flight experience, talk about Betaflight, help other people or get some help for yourself from the community.		
	Betaffight Configurator collects anonymous usage statistics. For example, this data includes (but is not limited to) the number of launche trends, and for possible UI improvements. Users can opt-our of data collection in the Options tab.	s, geographical region of the users, types of flight controllers, firmware versions, usage of UI elements and tabs, etc. The summary of this data is shared here. Collection is do	e in order to better understand how Betafight Configurator is being used, to understand community
	Change language: System Default (English), Català, Dansk, Deutsch, English, Español, Buskera, Français, Galego, Italiano, 日本語, 환국어,	Nederlands, Portugués, Portugués Brasileiro, Polski, Pyrcowk, Yapalwoka, 微体中文, 繁禧中文	
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#### Step 8: Verify the Firmware

- 1. Go to the **"Setup"** tab in Betaflight Configurator.
- 2. Verify that the correct firmware version is installed and that all sensors and peripherals are functioning correctly.

### 7. Contact

- Website: <u>https://zerodrag.in/</u>
- Instagram: <u>https://www.instagram.com/zerodrag.in/</u>
- LinkedIn: <u>https://www.linkedin.com/company/zerodrag/</u>
- **(b)** WhatsApp: <u>https://wa.me/9821734544</u>