

# Introduction

HDZero Radio is a new compact ExpressLRS radio designed to make ELRS simple, fast, and usable without extra gear.

The core idea is straightforward: ELRS is extremely powerful, but it can be confusing to bind and configure in the field. HDZero Radio solves this by putting the controls pilots actually use directly on the radio, with clear menus and dedicated shortcuts.

With built-in 250 mW ELRS, full onboard configuration, and a smooth OLED interface, HDZero Radio removes the need for phones, laptops, or external tools during setup and flying. The HDZero radio is well suited as both a starter radio and a compact travel or secondary radio. This does not run EdgeTX, instead of a general-purpose OS, we built a slim, FPV-first interface that focuses on the things pilots actually change day-to-day.

The HDZero Radio makes it easy to share the FPV hobby with others using its built-in Trainer (Buddy Box) support. With a standard DSC trainer jack, an instructor can safely hand control to a student while retaining instant override. This makes learning faster, safer, and far less intimidating for new pilots.

## **Why it's interesting:**

- 250 mW ELRS with full configuration onboard
- One-touch button opens the ELRS configuration menu
- Packet rate, telemetry, output power, and VTX settings in one place
- Press-and-hold shortcut for ELRS binding
- Full ELRS menu still available for advanced users
- Built-in OLED with smooth 50 fps UI, including live stick visualization
- VTX Admin to change band, channel, and power without touching the aircraft

## **Where it really shines:**

- Excellent starter radio for pilots learning ELRS
- Ideal second or travel radio — compact, lightweight, sticks stow inside, hard case included
- Full ELRS control in the field without a phone or laptop
- Great buddy-box radio for teaching using the trainer jack

## **More highlights:**

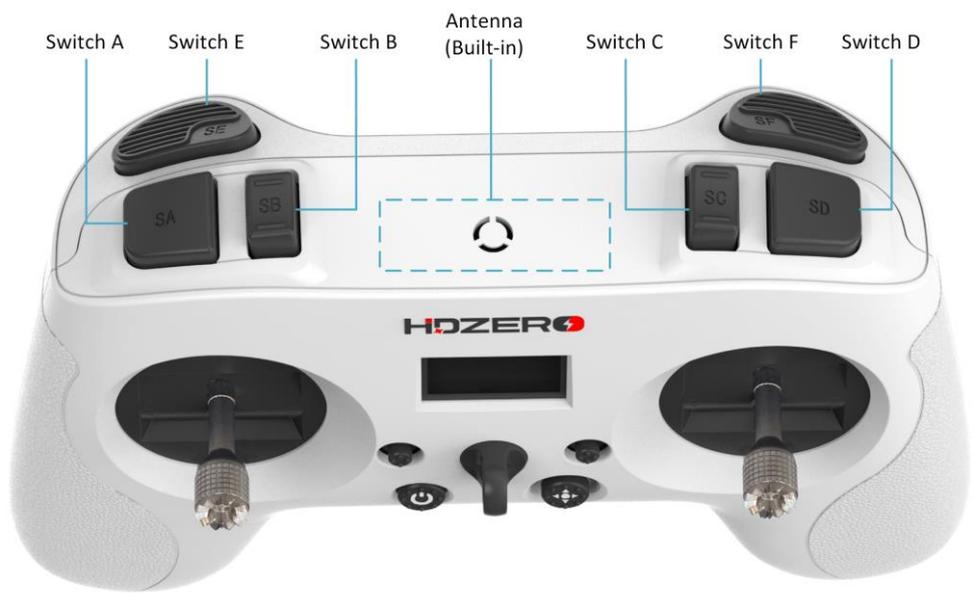
- ELRS Backpack support to sync video channels between drone and goggles
- Bluetooth ELRS joystick mode for wireless simulator use
- Trainer jack also supports head tracking from compatible goggles
- Up to ~10 hours of battery life at 10 mW

HDZero Radio does not run EdgeTX. To target entry-level pricing it uses a purpose-built, FPV-first interface instead of a general-purpose operating system. This allows faster access to the settings pilots change day-to-day, while keeping the radio simple, reliable, and affordable.

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# Diagram



## Features

- HDZero Independent OS
- Built-in OLED:
  - ◆ Sunlight-readable
  - ◆ 50FPS rendering for smooth display
  - ◆ One-click toggle between Radio and ELRS menus
- Built-in ELRS TX:
  - ◆ Native ELRS OLED menu
  - ◆ Max 250mW output power
  - ◆ Supports up to 500Hz packet rate with ultra-low latency
  - ◆ One-click quick binding
  - ◆ Bluetooth connectivity for wireless FPV simulator support
- Built-in ELRS Backpack:
  - ◆ Set Goggle band & channel via the radio
- Built-in Battery:
  - ◆ 4000mAh(14.8Wh) 3.7v high-capacity lithium battery
  - ◆ Over 10hours of battery life<sup>1</sup>
- USB-C Port:
  - ◆ Firmware updates via PC
  - ◆ HID support for FPV simulator(wired)
- Trainer Jack:
  - ◆ Master/Slave mode for FPV education
  - ◆ Head tracker input for HDZero goggles
- Sticks can be removed and stored on the back
- Hardshell carrying case included

<sup>1</sup> Tested at 10mW/250Hz until voltage dropped to 3.2V.

## Specifications

Model	HDZero Radio
Color	White
Frequency	2.4GHz
ELRS Tx Power (mW)	10, 25, 50, 100, 250
Display	0.96-inch OLED
Channels	Up to 10CH
Battery	4000mAh Lipo (3.2V ~ 4.2V)
Charging	5V @ 2A
Dimensions (mm)	165 x 128 x 68
Weight(gram)	270(with battery)

## Included Accessories

- 1x HDZero Radio
- 1x Type-C cable
- 1x Nylon Neck Strap (Lanyard)
- 1x Hardshell Carrying Case

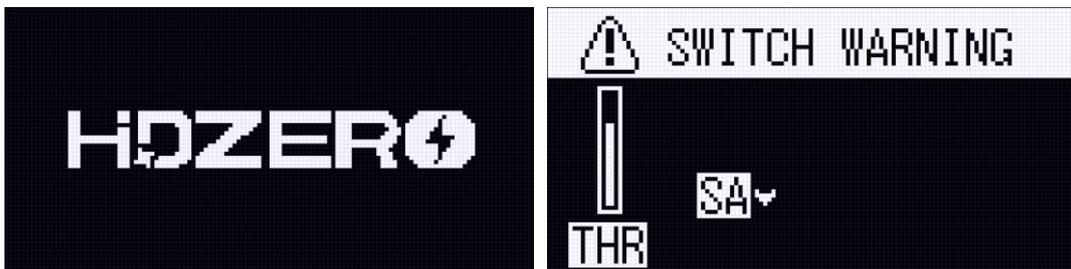


# HDZero Radio Operation

This section describes the general operation of the HDZero radio.

## Power On/Off

- Press and hold the power button, wait for the HDZero logo to appear on the screen. When the logo is fully displayed, the radio will vibrate once. Then, release the power button and the radio will power on successfully.
- Press and hold the power button, wait for the HDZero logo to disappear on the screen. When the logo has fully disappeared, the radio will vibrate once. Then, release the power button and the radio will power off.



## Switch Warning

If the throttle stick is not in the lowest position, move it to the lowest position; if the default “arm” switch SA is pressed down, flip it up.

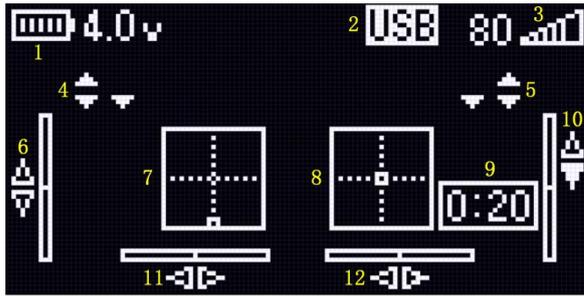
You can also modify the switch warning check during startup in the Startup Check menu.

## Charging

To ensure safety during storage and transportation, the radio battery is shipped with about 3.9V charge.

- Use the USB-C cable to connect the radio to any USB charger.
- When charging, the red LED light on the right side of the USB-C port will turn on; when fully charged, the LED light will change from red to green.
- The maximum charging specification is 2A@5V. Rapid charging is not supported.
- The radio features overcharge protection, so there’s no need to worry about the radio being overcharged.
- When the radio's battery is low, the radio will issue a low-voltage alert, and the buzzer will sound simultaneously with vibration.

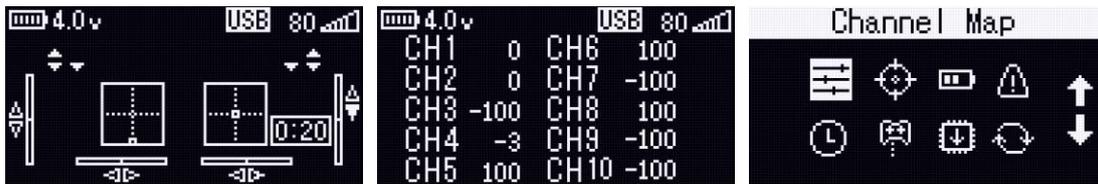
## Main View



- |                             |                               |                                |
|-----------------------------|-------------------------------|--------------------------------|
| 1: Battery voltage          | 2: Connection mode            | 3: ELRS signal                 |
| 4: Left switch view         | 5: Right switch view          | 6: Left up/down trim view      |
| 7: Left joystick view       | 8: Right joystick view        | 9: Timer                       |
| 10: Right up/down trim view | 11: Left left/right trim view | 12: Right left/right trim view |

## Controls

The menu button is used to switch the radio menu interface and is a five-way button. The main interface, joystick preview interface, and menu interface can be switched left and right using the menu button.



In the menu interface, use the menu button to navigate options up and down. Press the button to confirm and select an option, and press the left menu button to return to the previous menu level.

## Channel Map

The channel map menu allows changing the output channel order of joystick and switches. By default, the channel map is AETR (default for most flight controllers). To change to another order, like TAER (common for Spektrum and some pre-built models), short press the channel function until “AIL” changes to “THR”. Repeat the process for the remaining channels.

Channel	AETR (default)	TAER
Ch1	AIL (Aileron)	THR
Ch2	ELE (Elevator)	AIL
Ch3	THR (Throttle)	ELE
Ch4	RUD (Rudder)	RUD
Ch5-10	Top switches	

CH	FUNC	DIR	CH	FUNC	DIR
1	AIL	+	1	THR	+
2	ELE	+	2	AIL	+
3	THR	+	3	ELE	+
4	RUD	+	4	RUD	+

To change the direction of a channel, short press in the “DIR” column.

To change from “Left Throttle” (Mode 2 - default), to “Right Throttle” (Mode 1), short press to toggle between the two. This change requires swapping the left and right side gimbals inside the radio.

CH	FUNC	DIR	CH	FUNC	DIR
8	SD	+	8	SD	+
9	SE	+	9	SE	+
10	SF	+	10	SF	+
Left Throttle			Right Throttle		

It is also possible to assign any of the channels to a head tracking input channel. For instance, to use a channel to control the panning side to side movement of a camera, re-assign channel 10 to HT1. For a tilt servo, reassign to HT2, and so on.

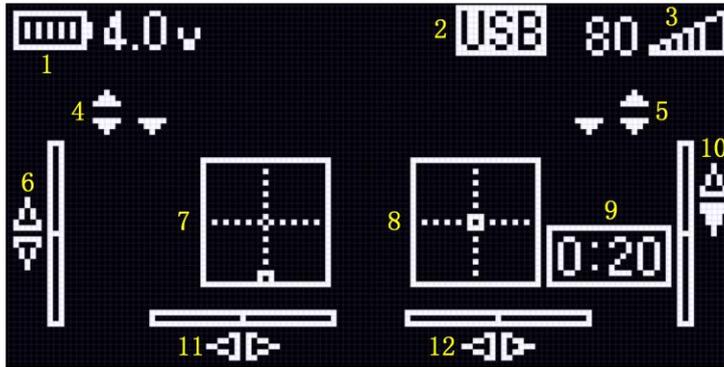
## Trim

The trim buttons allow manual adjustment of joystick offset to help a model fly straight.

**Note:** For models with a flight controller, do not trim the joysticks on the radio – allow the flight controller to make these adjustments. If joysticks are not centered properly when at rest, you can perform a calibration in the “Calibration” menu.

To use the trim function:

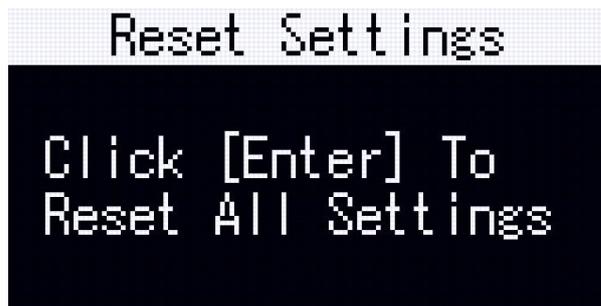
- Short press the trim button up/down/left/right, and the output of the corresponding joystick will shift up/down/left/right.
- Long press the trim button up/down/left/right, and the output of the corresponding joystick will continue to shift up/down/left/right until released.
- On the main view screen, 6 and 11 indicate the trim for the left stick, while 10 and 12 indicate the trim for the right stick. A solid white triangular indicator means the trim button has been offset in the corresponding direction. A hollow triangular indicator means the trim button is at its central initial position with no offset.
- The radio will vibrate as an alert when the trim button is adjusted back to the center position.



## Reset Settings

Reset settings will restore all settings on the HDZero Radio to their initial default values, excluding ELRS settings.

To reset settings, navigate to the Reset Settings menu. Short press the menu button to enter, then short press it again to complete the reset.



## Force shutdown

If you encounter issues such as software freezing while using the radio, you can force a shutdown by pressing a combination of buttons. After restarting, it should resume normal operation.

The combination for forced shutdown is:

Left trim button, right trim button, and menu button. Press and hold these three buttons simultaneously to force the radio off (the order of pressing does not matter).

# ELRS Menu

Short-press the ELRS button to switch from the radio menu to the ELRS menu. The radio's ELRS firmware version will be displayed during the switch.



## Binding

The HDZero radio comes with full ELRS functionality and supports binding via the ELRS menu. It also features a dedicated binding shortcut key.

### Binding via the ELRS menu

- Turn on the radio and enter the ELRS menu.
- Put the receiver into binding mode.
- Navigate to the bind mode menu within the ELRS menu, and short-press the menu button to start binding.
- If binding fails, please retry later.



### Bind via the shortcut key

- Turn on the radio.
- Put the receiver into binding mode.
- Long-press the ELRS button on the bottom of the radio. The radio will start binding once it vibrates.
- If binding fails, please retry later.

## ELRS Menu Options

Long-press the menu button to enter the ELRS settings menu. Navigate up and down. Navigate right to enter submenu, navigate left to go back. Here you can configure:

- **Packet Rate**
  - Recommended: 250hz (Racing: 500hz)
- **Switch Mode**
  - Recommended: Wide
- **TX Power**
  - Recommended: Max Power: 100-250mW, Dynamic Power: On
- **Telemetry Ratio**
  - Recommended: Std (Racing: Race)
- **BLE Gamepad (Bluetooth joystick)**

- Connect to PC or phone with Bluetooth for simulator use. Function described below.
- **Bind mode**
  - Start binding to ELRS receiver
- **WiFi Admin**
  - TX WiFi: update ELRS transmitter firmware via WiFi
  - RX WiFi: update ELRS receiver firmware via WiFi
  - Backpack WiFi: update ELRS Backpack firmware via WiFi
  - VRX WiFi: update VRX ELRS firmware via WiFi
- **VTX Admin**
  - Function described below

## VTX Admin – Video Channel & Power Control

Utilize ELRS VTX Administrator to adjust VTX settings on the radio, even when the VTX is not yet powered on.

1. Long-press the menu button to enter ELRS settings
2. Scroll up to VTX Admin and press menu button to enter config
3. Here navigate up and down to configure:
  - a. VTX Channel
  - b. VTX Band (set to “R” for Race Band)
  - c. VTX Power (- = no change, 1 = 25mW, 2 = 200mW, etc)
  - d. VTX Pitmode
  - e. Send (applies VTX setting, only needed if VTX is already powered on)



## ELRS TX Backpack

The HDZero Radio includes a built-in ELRS Backpack (factory version 1.5.4).

This allows automatic synchronization of video band and channel settings with compatible HDZero goggles, including:

- HDZero Goggle 2
- HDZero BoxPro

Once connected, you can change video band and channel directly from the radio using VTX Admin.

### Initial Setup (First Use)

Using HDZero Goggle 2 as an example:

#### 1. Confirm Backpack Version

Ensure the ELRS Backpack firmware version on the radio and goggles is identical.

#### 2. Bind the Goggles to the Radio (if required)

If the binding phrase differs between the radio and goggles, manual binding is required the first time.

#### On HDZero Goggle 2:

- ELRS → Backpack → ON
- ELRS → Bind

#### On HDZero Radio:

- Open ELRS Menu → Bind  
or
- Long press the ELRS button for quick bind

After a few seconds, the goggles will display a successful bind message and show the corresponding UID.

#### Syncing Video Band and Channel

Once bound, the radio can control video band and channel selection.

On the HDZero Radio:

1. Enter ExpressLRS Menu
2. Select VTX Admin
3. Set desired Band
4. Set desired Channel
5. Select Send VTX

The goggles will automatically update to the selected band and channel.

#### Additional Notes

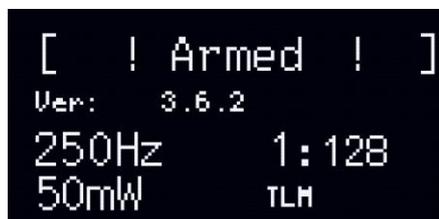
- Both HDZero digital receivers and built-in analog receiver channels can be configured using VTX Admin.
- Binding is only required once unless firmware or binding phrase changes.

#### ELRS Menu Access Restrictions

The ELRS menu is unavailable in the following conditions:

1. **Radio Armed (CH5 active)**

In ELRS v3.x, CH5 is the default arm channel. When armed (SA switch down by default), ELRS configuration is disabled as a safety feature.



2. **USB HID Joystick Mode**

When connected via USB in HID mode, ELRS transmission is disabled.

3. **DSC Slave Mode**

When operating as a trainer slave, ELRS transmission is disabled.

# Connecting to a Simulator

The HDZero Radio has two operating methods that can connect to a computer to use the FPV simulator.

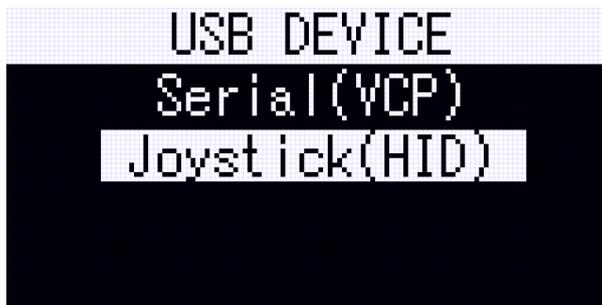
## Method 1: Bluetooth Joystick Mode

- Turn on the radio, enter the ELRS menu
- Navigate to the BLE Gamepad submenu and turn on the BLE Joystick
- Turn on the Bluetooth function of your computer, search for a new Bluetooth device
- Select the device named “ExpressLRS Joystick” to complete the connection



## Method 2: HID Joystick Mode

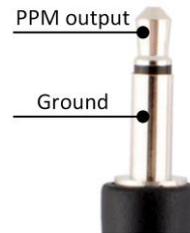
- Turn on the radio, and stay in the HDZero radio menu
- Connect the radio to your computer using a USB data cable
- Select the “Joystick (HID)” USB device in the radio
- The radio will now be recognized as “HDZero Joystick” on your computer



**Note:** ELRS transmitter radio is automatically disabled in this mode.

# Trainer Jack (DSC)

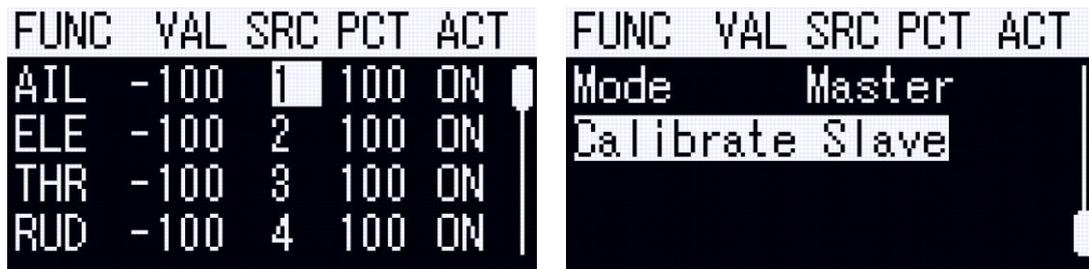
The HDZero Radio’s trainer jack supports multiple functions, including training mode and head tracking input from goggles. The trainer jack DSC function complies with industry standards and is compatible with most other radios with Spektrum, Edge TX, and other popular software. The trainer jack uses a 3.5mm mono (2-poles) cable as shown:



## Trainer Mode (Coach/Master)

The HDZero Radio can be a master controller, receiving signals from a slave radio. It allows selection of source signal percentage or use of the channel switch action on/off.

1. Connect the slave radio to the master radio port using the trainer cable
2. Turn on the radio, open radio menu and enter the DSC menu
3. Switch to master mode
4. The master radio will now receive signals from the slave radio



Use “Calibrate Slave” to ensure that the endpoints of the slave radio are correct. The “VAL” column shows the stick position of the slave radio from -100 to 100.

If the slave radio channel map differs from the master radio, re-order the channels by short pressing “SRC”.

To control how much the student and coach sticks interact, you can adjust the “PCT” column. 100 gives all control to the student, 50 gives student and coach 50% weight on stick inputs.

To control if a student has control of a channel, the “ACT” column has a few options:

- On: Student controls channel always
- Off: Coach controls channel always
- Switch Pos: Student controls channel if coach activates switch. Recommended: “SE Down” so coach holds the SE momentary switch to enable student to have control temporarily.

## Trainer Mode (Student/Slave)

The HDZero Radio can be a slave controller, sending signals to the master radio. ELRS transmitter radio is automatically disabled in this mode.



## Head Tracking Mode

The HDZero Radio can receive head tracking signals from the HDZero and BoxPro goggles and transmit them via ELRS. Once connected to the Goggle's HT output port, configure the channel map feature on the radio to assign HT1, HT2, or HT3 to any of the 10 channels of the radio.



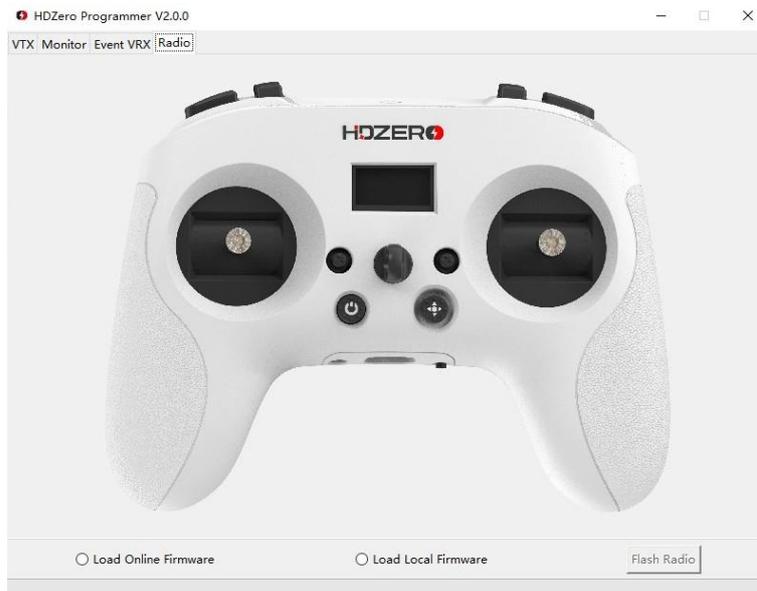
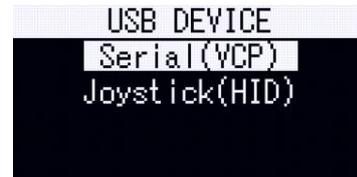
# Firmware Update

The radio comes preloaded with firmware V1.0.0 by default, which can be checked under the Firmware section in the menu. The ELRS firmware version can also be checked in the ELRS menu.

## HDZero Radio Update

Before updating, you must first install the [STM32 driver](#) and [CH340 driver](#) on your computer, disconnect any other STM32 devices, and ensure that Betaflight Configurator is closed. Only Windows® Operating System is supported currently.

- Turn on the radio, connect it to your computer using a USB cable
- Select the “Serial (VCP)” in the USB Device option
- Download the HDZero Programmer.zip from the [HDZero Download](#) page
- Open the HDZeroProgrammer.exe and switch to the radio tab
- Use “Load Online Firmware” to fetch firmware from GitHub, then select the desired version; or
- Use “Load Local firmware” to specify a local hdzero\_radio.bin
- Click “Flash Radio” to start the updating process

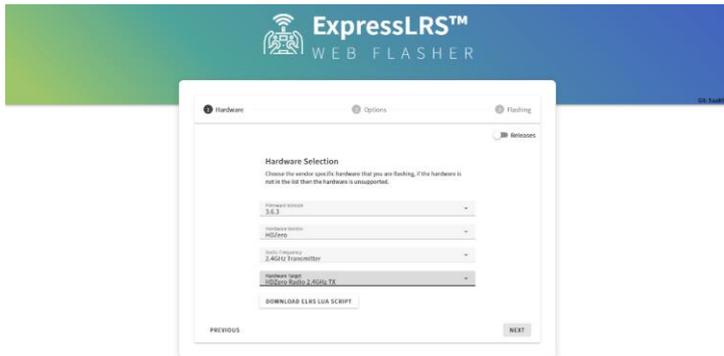


**Note:** Updating the HDZero Radio firmware will automatically update the Radio System, ELRS TX, and ELRS Backpack simultaneously. For specific ELRS TX and Backpack version details, please refer to the latest Release Notes.

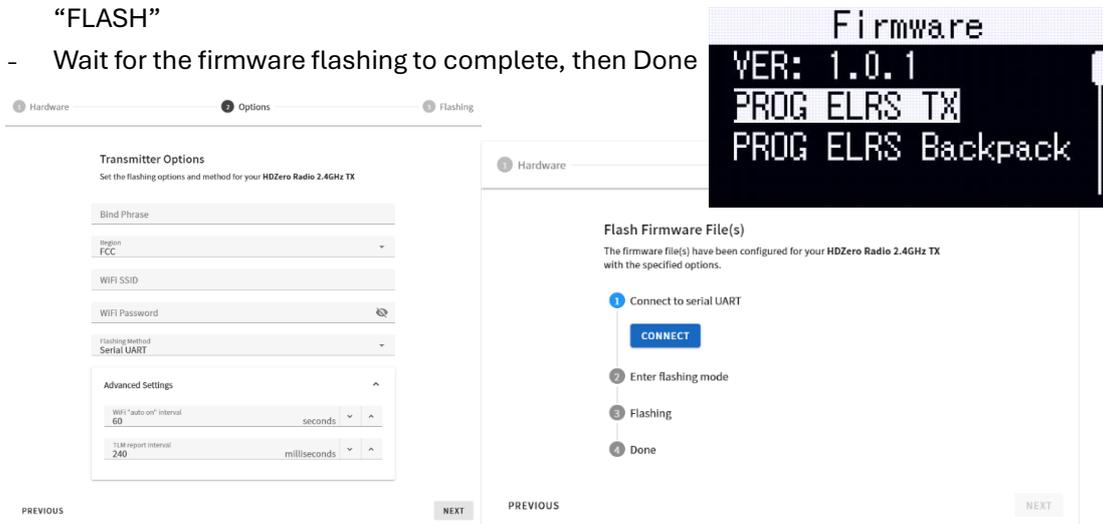
## ELRS Transmitter Update

There are multiple methods for updating ELRS, here we only cover the update via the ExpressLRS web UI and UART flashing method. Additionally, before updating the program

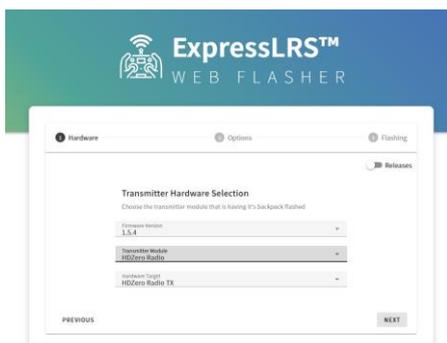
using the UART method, you need to install the [CH340 driver](#) on your computer. Note: if a PC isn't available, you may try updating via WiFi. Consult ELRS documentation for steps.



- Log in to the ELRS Web Flasher at the URL below:
  - <https://expresslrs.github.io/web-flasher/>
- Select the needed “Firmware Version”, then choose “HDZero - 2.4GHz Transmitter - HDZero Radio 2.4GHz TX”, then “NEXT”
- Select your preferred transmitter settings, and choose “Serial UART” as the flashing method, then “NEXT”
- Turn on the Radio, connect the radio and computer by the USB cable
- Select the serial (VCP) in the USB Device option
- Navigate to the “Firmware” menu, select “PROG ELRS TX”, and the radio will vibrate once
- “CONNECT” in the ELRS Web Flasher, select the corresponding USB serial, then start “FLASH”
- Wait for the firmware flashing to complete, then Done



**Note:** The firmware update method for ELRS backpack is the same as described above.



# Storage

## Joystick storage

The joystick is detachable and can be stored on the back of the radio. A copper nut is provided on the back of the radio to secure the joystick in place during storage. Storing it this way helps protect the gimbals from damage.



# Antenna Replacement (Optional)

The HDZero radio has a PCB transmit antenna installed inside the top. All radios undergo transmission power testing with professional instruments at the factory to ensure each antenna delivers optimal signal transmission performance.

Nevertheless, we have reserved an interface at the top of the radio housing to allow users to extend the antenna themselves.

The antenna can be replaced with a u.FL to SMA extension cable. Knock-out the plastic hole where indicated below and install the SMA connector. Choose any 2.4Ghz SMA antenna that meets your needs.



# Warranty

The HDZero Radio can be exchanged for a new unit within 7 days for any manufacturing defects if returned in new condition. The components are warranted for 1 year, if there are no signs of excessive use. Buyer will be responsible for shipping costs. If beyond the warranty period, we will provide repair services for a cost. For assistance with warranty issues, please contact [support@divimath.com](mailto:support@divimath.com).