

ESPConnect Browser Flash Tool

v1.00 – Released March 2, 2026 – Lynn Hansen, KU7Q

Introduction

[thelastoutpostworkshop](#) has released a new browser-based tool called [ESPConnect](#) that allows you to flash firmware to an ESP32 microcontroller without the need to download and install the EspressIF Flash Download tool.

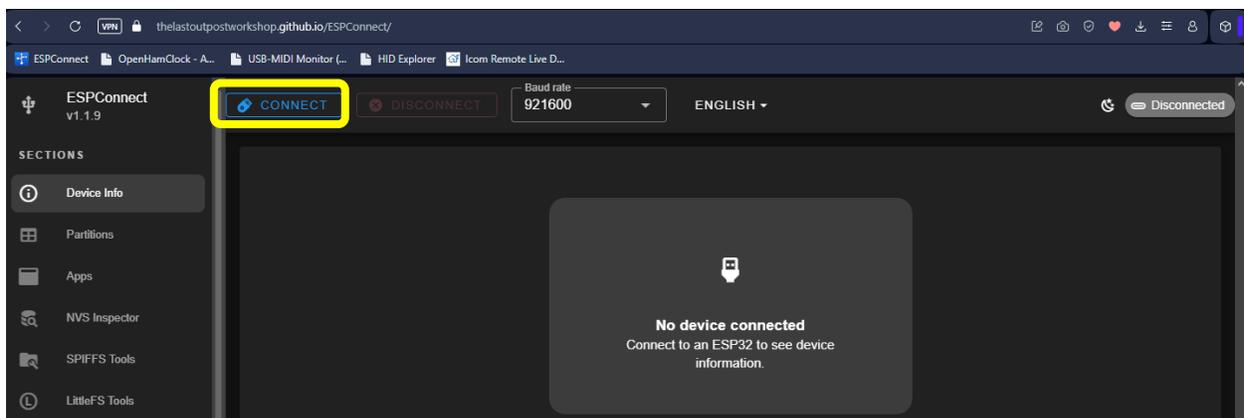
This tool is supported in Chrome, Edge, and Opera browsers on both Windows and Mac. As of the date of this revision, this tool is not supported in Linux.

ESPConnect works much better than EspressIF's own browser-based tool, [EspLaunchPad](#), described in an [earlier post](#) on [Lynovation.com](#). **ESPConnect is much easier to use**, in addition, it has the ability to switch the ESP32 from the default **TinyUSB** serial port to the **USB JTAG** programming port without the need of pressing the hardware Programming button on the processor.

Flashing Firmware with ESPConnect

Open the website

To start the browser-based flash tool, open either a **Chrome**, **Edge**, or **Opera** web browser then navigate to <https://thelastoutpostworkshop.github.io/ESPConnect/>. The screen below should appear.



Next, plug your **CTR2** unit into a USB port on your computer.

NOTE: Do not connect your **CTR2** unit to an unpowered USB hub. The ESP32 requires all of the power a standard USB port can provide.

Connect to your CTR2 unit

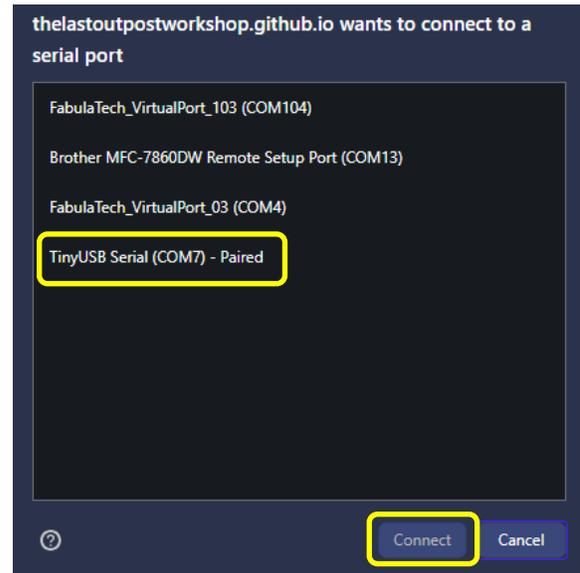
Click the **Connect** button at the top of the page.

A device list will pop up showing the available USB devices on your computer.

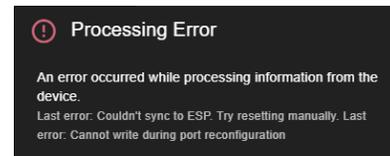
On a Windows PCs, all **CTR2** units, with the exception of the **CTR2-Micro**, will be shown as a **TinyUSB Serial** device, as shown here. **CTR2-Micro's** will be shown as a **USB JTAG** device.

On Macs, **CTR2** units based on the M5Dial will be listed as an **M5STACK_DIAL** device. **CTR2-MIDI** units will be shown as a **XIAO_ESP32S3** device, and **CTR2-Micro** units will be shown as a **XIAO_ESP32C2** device.

Select the **CTR2** device and click the **Connect** button.



On ESP32-S3 based devices (M5Dial and **CTR2-MIDI's**), a popup warning will appear telling you that an error occurred. Some errors may tell you to press the BOOT button on the processor to put it into bootloader mode. You do not need to do this.



This is the normal response when trying to connect to a **TinyUSB Serial** device.

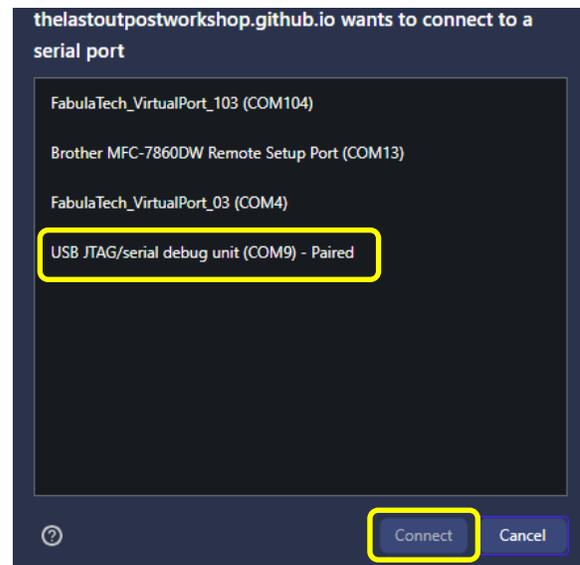
Click the **Connect** button on the home page again.

This time, the **TinyUSB serial** (or **M5STACK_DIAL** or **Xiao_ESP32S3** on Macs) will not be shown on the list. Instead, a new device, **USB JTAG/serial debug unit** will be shown (on both PCs and the Mac).

This is the bootloader port and the unit is now ready to program.

NOTE: **CTR2-Micro** units will start in the **USB JTAG** port.

Select the **USB JTAG/serial debug unit** device then click **Connect**.



Select the firmware .BIN file

Once you're connected to your **CTR2** unit, the left menu items on the page will be enabled.

<<< WARNING >>>

ESPConnect is a powerful device editor. Many of the functions can cause problems with **CTR2** firmware if you change them. If you don't know what a function does, **DON'T CHANGE IT!**

Click on the **Flash Tools** menu item and scroll down to the **Flash Firmware** section.

Click the **Firmware binary (.bin)** text box.



A file navigation screen will appear. Navigate to where you unzipped the firmware zip file from the firmware update page for your **CTR2** unit and click on the **.BIN** file.

The **.BIN** file for your **CTR2** device will be one of the following:

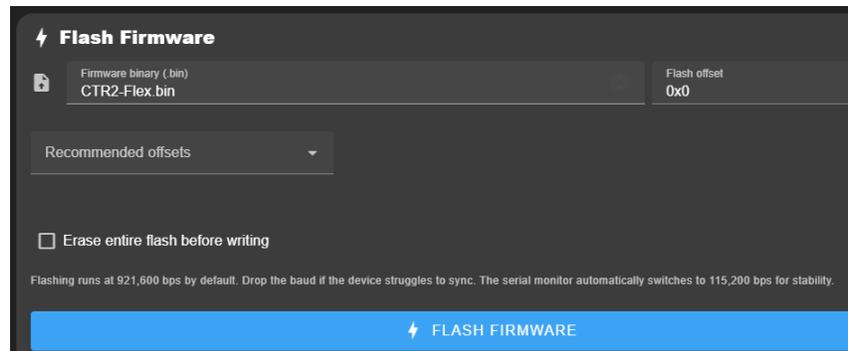
- All M5Dial-based **CTR2** controllers (with displays) firmware: [CTR2-Flex.bin](#)
- **CTR2-MIDI** controller firmware: [CTR2-MIDI.bin](#)
- **CTR2-Micro** controller firmware: [CTR2-Micro.bin](#)

Flash the firmware

Your display should now look like this (with the title of the **.BIN** file you selected):

Leave the **Flash offset** set to **0x0** and uncheck the **Erase entire flash before writing** checkbox.

Click the **FLASH FIRMWARE** button to start the flash process.



Once the process completes, cycle the power on your **CTR2** unit. On M5Dial-based units, the version # will be displayed when the unit boots. You'll need to connect a dumb terminal to your **CTR2-MIDI** or **CTR2-Micro** in order to see the version #. The version # should match the version # from the firmware zip file.

This completes the firmware update process.

The CTR2 unit doesn't switch to USB JTAG mode

A small number of ESP32-S3 microprocessors will not automatically switch their USB serial port from **TinyUSB** to **USB JTAG** when you first try to connect. If your **CTR2** unit has one of these processors, you'll need to open the enclosure to access the **Download** or **Programming** button on the processor's PCB.

On the **CTR2-MIDI** you can access the **Programming** button through the cutout on the left side of the USB connector hole. Use a toothpick or other non-conductive stick to press the tiny switch then cycle the power on the unit. The button is extremely small and you might find it easier to open the case and remove the PCB to access the button.



Entering programming mode on an M5Dial-based **CTR2** unit is a little easier. You'll still will need to open the enclosure though. On the New Age enclosure, remove the rubber feet and the tilt feet and remove the Phillips head screws securing the enclosure together. On the 3D printed enclosure remove the four button head hex screws on the side.

Once you have access to the back of the M5Dial press and hold the **BTN** graphic on the processor label with your finger (you should feel a slight click) then press and release the **Reset** button. The M5Dial's display will go blank once you enter programming mode.

NOTE: If you can't get the unit into programming mode, the plastic lever under the **BTN** label may have slipped of the button on the PCB board. If this happens, remove the label and use a small screwdriver or Xacto knife to flick the lever back onto the button.



Once you have the unit in download mode, [click the Connect button](#) on the web page, then connect to the **USB JTAG** device. Next, follow the instructions above to select and flash the .BIN file to your unit.