

WiFi Setup & User Guide

Connecting your device to your network, and troubleshooting when it will not

Your device runs custom firmware built on TempestMAX's open-source OSR2 codebase. It accepts T-code commands over **USB or WiFi**, controlling the machine in real time. WiFi is optional — the USB cable always works as a fallback.

There is no companion app. Setup happens in your phone's browser, much like setting up a smart bulb or a printer.

⚠ TWO BUTTONS, ONLY ONE OF WHICH IS SAFE TO PRESS

There are two small holes on the device. The **left one is EN** — safe to press at any time, and the one you will actually use. The **right one is BOOT**: pressing it puts the chip into firmware-flashing mode, and the device will stop responding until it is reflashed from a computer.

There is no way to recover from that on the device itself. If you only want to restart, press **EN** or simply unplug and replug the USB cable.

IN THIS GUIDE

- Part 1** Quick start — five steps
- Part 2** First-time setup in detail
- Part 3** The device buttons
- Part 4** Changing WiFi networks
- Part 5** Troubleshooting
- Part 6** Advanced — reflashing and options
- Part 7** Technical reference

Part 1 Quick start — five steps

For anyone who just wants to get going.

1. Plug in the device.
2. On your phone, open WiFi settings and join the network called `Setup-vESP-OSR2-XXXX` — the last four characters are unique to your unit.
3. A setup page should open by itself. If it does not, open a browser and go to `http://192.168.4.1`.
4. Pick your home WiFi from the dropdown, enter the password, and tap **Save & Connect**.
5. The device reboots and joins your network. Done.

From then on it appears on your network as `osr2.local` and listens for T-code commands on port `8080`.

Part 2 First-time setup in detail

What each step is doing, and what to expect.

Step 1 — find the setup network

Plug the device in and give it about five seconds. In your phone's WiFi settings you should see something like `Setup-vESP-OSR2-A4F2`. Those four characters are your device's identifier — always the same for that unit, so two devices in one household will not conflict. It is an open network; no password is needed to join it.

Step 2 — open the setup page

Once your phone joins, the configuration page usually pops up on its own as a captive-portal notification. Most iPhones and many Android phones do this within a few seconds. If it does not:

- **Samsung phones:** the option is sometimes hidden. Press and hold the network name, or look for “Manage Router” in the network details.
- **Any phone:** open a browser and type `http://192.168.4.1` — including the `http://` prefix.
- `http://osr2.local` reaches the same place.

Step 3 — configure

The setup page shows a **Network** dropdown (give it a few seconds to scan), a **Password** field with a show/hide toggle, and a **Save & Connect** button.

Pick your home WiFi, enter the password, and tap Save & Connect. You will see a confirmation, and the device reboots within a couple of seconds and joins your network. Your phone will drop off the setup network at that point — that is normal.

Step 4 — verify

The device is now reachable at `osr2.local` on port `8080`. From any computer on the same network:

```
ping osr2.local
```

If you get replies, setup is complete.

Part 3 The device buttons

Two holes. One is for you, one is not.

You will need a thin tool to reach them — a small Allen key does the job.

Left hole — EN (safe)

- **Press once:** safely reboots the device. The same as unplugging and replugging — nothing is lost.
- **Press twice within 3 seconds:** wipes the saved WiFi credentials and returns to setup mode. This is how you move it to a different network.

This is the button you will use day to day, and it is safe to press at any time.

Right hole — BOOT (leave alone)

This puts the chip into firmware-flashing mode. Do not press it unless you intend to reflash from a computer. If you press it by accident, the device may stop responding until it is reflashed over USB with the Arduino IDE — and it cannot be recovered from the device itself.

Part 4 Changing WiFi networks

New router, new house, or a password change.

Press the **EN** button (left hole) twice within three seconds. The device will:

1. Detect the rapid double-press
2. Erase the saved WiFi credentials
3. Boot back into setup mode, so `Setup-vESP-OSR2-XXXX` reappears

Then follow Part 2 again for the new network. A single press just reboots without erasing anything.

Part 5 Troubleshooting

In rough order of how often each one comes up.

The setup network does not appear

- Check the device has power — most boards have a power LED.
- Wait ten seconds after plugging in; WiFi takes a moment to start.
- Refresh your phone's WiFi list, or toggle WiFi off and on.
- Look for a network starting `Setup-vESP-OSR2-` .

The setup page does not open after joining

Most common on Android, Samsung especially. Open any browser and type `http://192.168.4.1` exactly. If the browser rewrites `http` to `https` , correct it back — the setup page does not use HTTPS.

“Save & Connect” succeeds but it never joins

Almost always a mistyped password. The device saves whatever you gave it and keeps trying, without knowing to ask again. Double-press **EN** to wipe the credentials, then redo setup.

Works on USB but not WiFi

- Check it actually joined: run `ping osr2.local` from a computer on the same network.
- Redo setup by double-pressing **EN**.
- **2.4 GHz only**. The ESP32 does not support 5 GHz. If your router advertises the two bands under different names, pick the 2.4 GHz one. If they share a name, the router handles it.

osr2.local will not resolve

- Mac, iPhone, iPad, Linux, Windows 10 and 11: works out of the box.
- Older Windows: install Bonjour Print Services from Apple (free, about 3 MB).
- Or find the device's IP on your router's admin page and use that directly.

Finding the device's IP address

Open a serial monitor (Arduino IDE → Serial Monitor at 115200 baud) over USB, press **EN** to reboot, and watch for a line like:

```
WiFi connected. IP: 192.168.1.93 Port: 8080
```

Alternatively, look for `osr2` in your router's list of connected devices.

My phone warns of “no internet” on the setup network

Expected. The setup network exists only for configuration and has no internet connection. Once your home credentials are saved and the device reboots, it disappears entirely.

It went into setup mode by itself

This should only happen if **EN** was pressed twice quickly — a knock against an exposed button, for instance. The three-second window makes accidental triggering unlikely but not impossible. If credentials survive normal power cycles, the system is behaving correctly.

I pressed BOOT and now nothing works

The device is stuck in firmware-flashing mode. It needs reflashing over USB with the Arduino IDE — see Part 6, or get in touch and I will walk you through it.

Part 6 Advanced — reflashing and options

For anyone who wants to update the firmware themselves.

KEEP YOUR WIFI CREDENTIALS ACROSS A REFLASH

By default the Arduino IDE erases all flash on upload, which wipes the saved WiFi settings along with the firmware. To keep them: in **Arduino IDE 2.x**, set Tools → “Erase All Flash Before Sketch Upload” to **Disabled**. In **1.x**, set Tools → “Erase Flash” to **Sketch Only**.

Compile-time options

A few flags can be changed by editing the `.ino` file. Most people will never need to.

<code>WIFI_ENABLED</code>	Set false to disable WiFi entirely — faster boot, smaller binary, USB only
<code>MDNS_HOSTNAME</code>	Changes the hostname, e.g. <code>myosr.local</code>
<code>WIFI_PORT</code>	TCP port for T-code commands
<code>AP_SSID_PREFIX</code>	The setup network's name prefix

Required libraries

None beyond the standard ESP32 Arduino core. Install ESP32 board support through Tools → Board Manager, search “esp32”. Every library this firmware uses is included with it.

Part 7 Technical reference

WiFi standard	2.4 GHz only (802.11 b/g/n)
T-code TCP port	8080
Setup page port	80 (active only during provisioning)
Hostname	<code>osr2.local</code>
Setup network prefix	<code>Setup-vESP-OSR2-</code>
Setup network IP	<code>192.168.4.1</code>
Boot time	~1 second
Serial baud rate	115200
Reset gesture	Double-press EN (left hole) within 3 seconds
Left button	EN — safe. Reboots, or wipes WiFi on a double-press
Right button	BOOT — do not press. Requires a reflash to recover

SUPPORT AND UPDATES

This firmware is built on the open-source TempestMAx OSR2 codebase, with extensive modifications for usability and reliability. Setup help and firmware questions do not expire — they are available for as long as you own the machine. Get in touch whenever you need them.

V E S P E R A