

# Load the firmware and connect to WiFi

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Reading time: ~15 minutes · Execution time: 20-30 minutes · Audience: anyone who just finished assembling the controller following [guide 02](#)

**Fundamental Guide** — mandatory onboarding path. Without it, the system will not start.

**Your JoyReef Path:**

1. Shopping list
2. Controller assembly
3. **Firmware + WiFi ← YOU ARE HERE**
4. Tank and sensor configuration
5. Tasmota smart plugs
6. Automations (ATO, etc.)

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## 1. Before you start

For this guide you need:

- The **controller already assembled** as in [guide 02](#): NodeMCU on the board, probe + display + float switches connected
- The **micro-USB data cable** (must pass data, not just power — see shopping list)
- A **computer** (Windows, macOS, or Linux) — not a phone, for this part you need a real PC
- **Google Chrome** or **Microsoft Edge** installed on the computer (Safari and Firefox **do not work** for loading firmware)
- A **2.4 GHz WiFi network** available at home (modern 5 GHz networks from newer routers are not supported by the controller)
- A **phone** or the same computer, for the WiFi configuration step (later)

**2.4 GHz WiFi is mandatory:** the NodeMCU's WiFi chip (model **ESP8266**) **does not support 5 GHz networks**; it's a hardware limitation of the chip and cannot be bypassed. Most modern routers offer both bands simultaneously; if your router has them merged into a single network (a feature called "band steering" or "unified WiFi"), the controller might fail to connect. **In case of problems, temporarily disable the 5 GHz network from your router's configuration page** — the controller will find the 2.4 GHz one immediately. Once it's connected, you can re-enable the 5 GHz: the controller remains connected to the network it learned to join. If in doubt, ask your Internet provider.

## 2. Create your JoyReef account

Before loading the firmware onto the controller, you must have a JoyReef account: the portal is the "brain" that receives data from the controller and allows you to view it from any phone or computer.

### Registration

1. Open [portal.joy-reef.com](https://portal.joy-reef.com) in Chrome or Edge
2. Click "**Register**" in the top right (or go directly to [portal.joy-reef.com/register](https://portal.joy-reef.com/register) )
3. Fill out the form: - **Email**: the one you will use to log in - **Password**: choose a secure one, at least 8 characters - **Confirm password**: same as above
4. Click **Register**

### Email verification

Immediately after registration, the portal will ask you to **verify your email**:

1. Check your inbox (also check **Spam/Junk** — sometimes the first message ends up there)
2. Open the "Verify your email address" message
3. Click on the **verification link**

Once your email is verified, you are in: you will see the portal dashboard, currently empty — this is normal, it will receive data as soon as the controller is connected.

**Important:** the email and password you just chose are **also your controller's credentials**. When you have to configure it (later in this same guide), you will use exactly the same data. You don't need separate "MQTT credentials" from somewhere else.

**Not receiving the verification email?** Wait 1-2 minutes, check your Spam folder. If it doesn't arrive at all, you can click "Resend verification email" from the portal. If still nothing, write to us at [supporto@joy-reef.com](mailto:supporto@joy-reef.com).

## 3. Firmware flash and WiFi connection

The firmware loading and WiFi connection process is the same for all JoyReef devices and is described in the dedicated guide:

### Guide 03b — Firmware Flash and WiFi Connection

Follow that guide selecting the "**Controller**" firmware on the [/usb-flash](#) page. When done, come back here.

## 5. You've connected the controller!

Well done, you've done the hardest part. From now on, everything is configured **from the portal** from your couch: no more USB cables, no more captive portals.

**System status right now:** hardware ✓, firmware ✓, WiFi ✓, JoyReef account ✓, controller online on portal ✓.

### What's missing to have a dashboard full of useful data:

The controller is already sending its sensor readings to the portal, but JoyReef **doesn't know what they're for yet**: is the DS18B20 probe "the temperature"? And of the 4 float switches, which one is "low level ATO" and which one is "safety level"? You need to **tell the portal who is who**.

#### Guide 04 — Tank and sensor configuration (~10 min)

In that guide, you will create your first virtual tank, assign sensors to their reef-keeping functions (tank temperature, sump level, etc.), and see the dashboard populated with your live data.

*Happy reefing!*