

How to use Firefly's control panel

Once Firefly is on your network, open its IP in a browser. The dashboard has two columns: **System** (logger, programs, variables) and your panels. Everything is stored on the device and keeps running after you close the browser.

Creating a panel

[SCREENSHOT: dashboard with the New Panel form open]

- Click **New panel**. Fill in **Name** (short, no spaces - rules refer to it), **Unit** (shown beside the value, e.g. C, L, cm), and **Type**.
- For **input** and **output** also pick the **Hardware** driver and the pin(s); the form labels change per driver (e.g. SDA/SCL, Trig/Echo, Signal).
- Click **Create**. The card appears after a refresh; values update live.

Panel types:

- **input** - sensors. Drivers: `analog_in` (A0), `digital_in`, `ds18b20` (OneWire temperature), `bmp180` (I2C pressure + temperature), `us_sensor` (HC-SR04 trig/echo, needs 5 V power with a divided echo), `flow` (hall pulse counters: water flow, RPM).
- **output** - actuators. Drivers: `digital_out` (relays, LEDs - honors the global `active_low` setting) and `servo` (0-180 degrees on any PWM pin except D0/A0, powered externally). Type the value into the number field on the card.
- **set** - a simple on/off switch on a pin, for relays and LEDs.
- **timer** - off/on schedules on a pin: dash-separated seconds starting from off (`10-10`, or `5-10-3-8`), a count limit (0 = forever), an output override switch, and an hours mode with clock on/off times.
- **push_btn** - a physical button: choose the released level (button-to-GND or to 3.3 V) and bind short, double and long press to programs from dropdowns.

Log, OLED and MQTT buttons

Every card ends with three small membership buttons. **Log** adds the panel to the logger file, **OLED** shows it on the display (scrolling one at a time, or pages of four in list mode), **MQTT** publishes it to the broker. All three persist across reboots.

Calibration

Input cards show a calibration section with **Low**, **High** and **Reset** buttons plus an offset field:

- Put the sensor at a known low reading, press **Low**, enter the true value.
- Put it at a known high reading, press **High**, enter the true value.
- **Reset** clears the calibration (on flow panels it also zeroes the pulse counter).

Example - water flow in liters: Reset, run exactly 2 liters through, High + enter 2. The panel now reads liters with a liters/min rate beside it. **Low** with 0 tares a container at any time. Averaging (16 samples) is available per panel for noisy signals.

Automation: programs, rules, variables

[SCREENSHOT: a program card with two rules]

Automation lives in **programs** (main always exists, add named ones). A program holds **rules** of the form **IF** source operation value **THEN** action, for example **IF** temperature > 25 **THEN** heater = 0. Sources can be panels, plain or computed variables (A + B), other programs, or built-ins (millis, time, board). Rules fire **once** on a rising edge or **while** the condition holds, and extra conditions join with && / ||. Programs also run ordered **SET** and **WAIT** steps when started, and a push-button press can start one.

Logger

The logger card records every Log-enabled panel on an interval to a file on the device (logger_file, default dataLog.csv). **Snap** logs one row now, **Save** flushes to flash, **Upload** POSTs the file to a logger_host gateway. Interval, file and host are set in Settings; the graph page draws the file natively in the browser.

Backup, restore, settings

Backup downloads one text file with all panels, variables, rules, logger config and settings. **Restore** (file or pasted text) replaces everything with it - the portable way to clone a board. **Settings** edits the key, value file directly (WiFi, device name, active_low, MQTT, OLED, beacon, logger); WiFi and name apply after restart.