

WaterTracker

Product manual and local setup guide



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About this draft

This manual documents the behavior currently implemented in the WaterTracker firmware and dashboard. Manufacturer identity, conformity declarations, final electrical ratings, disposal markings, and market-specific legal text still require release approval.

Purpose and intended use

WaterTracker is a locally usable drinking tracker. It observes the weight of a drinking vessel placed on its surface, records detected drinking events, and presents hydration information through its LED ring, browser dashboard, and optional Home Assistant connection. A manufacturer cloud account is not required for normal local use.

Important limitations

WaterTracker is not a medical device. Its measurements and reminders must not replace medical advice, prescribed fluid restrictions, or professional monitoring.

Safety

- Use the device indoors on a stable, level, and dry surface.
- Do not immerse the device, connectors, or power supply in water.
- Disconnect power before cleaning. Use only a slightly damp cloth and allow the device to dry completely before reconnecting it.
- Stop using the device if its enclosure, cable, connector, or power supply is damaged.
- Keep the device and cable away from heat sources and positions where the cable creates a trip or pull hazard.

First setup

Position and power the device

Place WaterTracker on a rigid, level surface where the drinking vessel can remain undisturbed. Connect the supported USB power supply and wait for the device to finish starting.

Authorize the first Bluetooth connection

1. Open the WaterTracker dashboard in a browser with Web Bluetooth support.

2. Power WaterTracker. A new or reset device automatically opens Bluetooth pairing and the Recovery network for five minutes.
3. Within those five minutes, select **Connect to device** and choose WaterTracker in the browser's Bluetooth dialog. If the device switches off first, disconnect and reconnect power to start a new five-minute window.
4. The operating system establishes an encrypted BLE connection and stores the bond. The blue animation stops and the pairing window closes after authentication. A previously bonded client can reconnect without another long button press.
5. To authorize a new, unbonded client on an already configured device, hold any physical button for two seconds. This manually opened pairing window remains available until authentication succeeds.

iPhone and iPad

If the current iOS browser does not expose Web Bluetooth, the dashboard offers a link to Bluefy - Web BLE Browser. Bluefy is a third-party compatibility option. You may also continue through the dashboard without connecting a device.

Configure and calibrate

1. Enter the Wi-Fi credentials in the dashboard if network features or official updates should be available.
2. Follow the calibration flow below before relying on measured quantities.
3. Set the daily drinking goal, local reset time, timezone, and LED brightness.
4. Confirm that the displayed weight and water quantity react plausibly before relying on drinking history.

Calibrate the scale

Use the glass that will normally remain on WaterTracker. Keep the device on a rigid, level surface and leave it untouched whenever it is waiting for a stable measurement.

1. Leave the WaterTracker surface completely empty while the ring is red. Initial noise measurement takes about 14 seconds after startup; continue waiting until the ring turns green.
2. Place the empty glass on WaterTracker. Do not touch it while the green ring is shown.
3. When the ring turns purple, remove the glass and wait.
4. When the ring turns orange, fill the same glass with exactly **200 ml** of water away from WaterTracker. Place it back on the device and wait.
5. Calibration finishes automatically when the normal blue hydration display appears. Check the displayed water amount in the dashboard.

The 200 ml reference must be accurate

Before calibration, WaterTracker can detect stable changes in the raw sensor signal but cannot independently verify the amount of water. Using another glass or an inaccurate water quantity produces inaccurate measurements. Restart calibration from the dashboard if a step was performed incorrectly.

Repair Wi-Fi access

The device-hosted recovery page is a fallback, not a second dashboard. A new device starts it together with Bluetooth pairing for five minutes. If Wi-Fi credentials are not saved during that window, WaterTracker powers down into deep sleep; disconnect and reconnect power to try again. Once Wi-Fi is configured, hold a physical button for ten seconds to enter Recovery. Manually opened Recovery remains active until restart; successful Bluetooth authentication closes only the pairing window. Perform Recovery in a trusted environment: the shared network password is documented publicly, so someone nearby could join the active network.

1. Hold any physical button for ten seconds. Continue holding after the blue Bluetooth indication. From six seconds onward, the ring emits 100 ms red ticks. Their pause decreases linearly from 630 ms to zero until the ring is solid red at ten seconds.
2. Release the button. The complete ring begins a slow turquoise breathing animation while Bluetooth and the Recovery network remain active together.
3. Connect to the WPA2 network ending in -recovery with the password `watertracker`.

4. Use the page that opens automatically, or visit <http://192.168.4.1/>, to select Wi-Fi and enter its password.
5. The Recovery page permanently links to the full dashboard and explains which controls are available there. After WaterTracker restarts, reconnect the phone to its normal network and open that dashboard link.

Daily use

Keep the calibrated drinking vessel on WaterTracker between drinks. Lift it normally, drink, and return it to the surface. The device evaluates the stable weight change and stores a confirmed drinking event when the measurement matches the configured detection rules.

History and privacy

Drinking history is stored locally on the device in a bounded FlashDB ring buffer. Diagnostic captures and generated support exports are stored in LittleFS. Settings, calibration, Wi-Fi credentials, and Bluetooth bonds are stored in NVS. Normal tracking does not require the drinking history to be uploaded to a manufacturer service.

LED indications



Blue blinking

Bluetooth pairing is active. On a new or reset device, the joint Bluetooth and Recovery window ends after five minutes unless Wi-Fi credentials have been saved; the device then powers down until power is disconnected and reconnected. A pairing window opened manually with a two-second button hold has no timer. Successful authentication ends the blue indication.



Accelerating red blinking

Starting at six seconds, 100 ms red ticks use linearly shorter pauses, beginning at 630 ms. At ten seconds the ring remains solid red.



Turquoise breathing

Wi-Fi Recovery is active. The whole ring slowly brightens and dims without rotating.



Yellow progress ring

Local data storage is prepared during the first startup. The same indication appears when FlashDB history and diagnostics are reset. The ring fills with the verified erase progress; do not dis-

connect power during this operation. Two short full-ring yellow signals confirm completion before normal operation resumes.



Orange warning

The device detected a recoverable condition such as missing time synchronization or an unavailable update service.



Red blinking

A critical persistent-storage or Factory Reset error needs attention. Reboot once; if the indication returns, retrieve diagnostics before continuing normal use.

Firmware updates and owner control

Official over-the-air firmware is accepted only when it carries a signature trusted by the installed firmware. Stable and beta channels can be selected through the dashboard. Developer-owned Internal enrollment requires a deliberate USB flash. Hardware Secure Boot is not enabled: the owner remains free to install other firmware directly over USB.

Factory Reset

Factory Reset removes settings, calibration, Wi-Fi credentials, timezone data, Bluetooth bonds, drinking history, diagnostic records, generated exports, and manual captures. It does not downgrade or remove the currently installed firmware.

Do not remove power during reset

The firmware records an in-progress reset before erasing data and resumes an interrupted cleanup at the next boot. If a storage area cannot be erased and verified, the LED ring blinks red instead of reporting success.

Troubleshooting

The device is missing from the Bluetooth chooser

During first setup, the five-minute window may have expired. Disconnect and reconnect power. On an already configured device, hold any physical button for two seconds and retry while the ring is blinking blue.

A previously paired client no longer reconnects

Check whether browser data or the operating-system Bluetooth bond was removed. If so, open a new physical pairing window.

Drinking quantities appear implausible

Move the device to a rigid level surface, verify that the vessel is stable, and repeat calibration.

The LED ring keeps blinking red

Reboot once. If the error returns, download the diagnostic bundle and stop relying on new history until the storage problem is understood.

Diagnostics and support

An authorized local dashboard session can create an NDJSON diagnostic export and download HX711 captures. A developer can retrieve the same support bundle with the repository command `pnpm diagnostics:download`. The USB cable may provide power and serial logs, but diagnostic files are transferred through the encrypted, versioned BLE protocol.