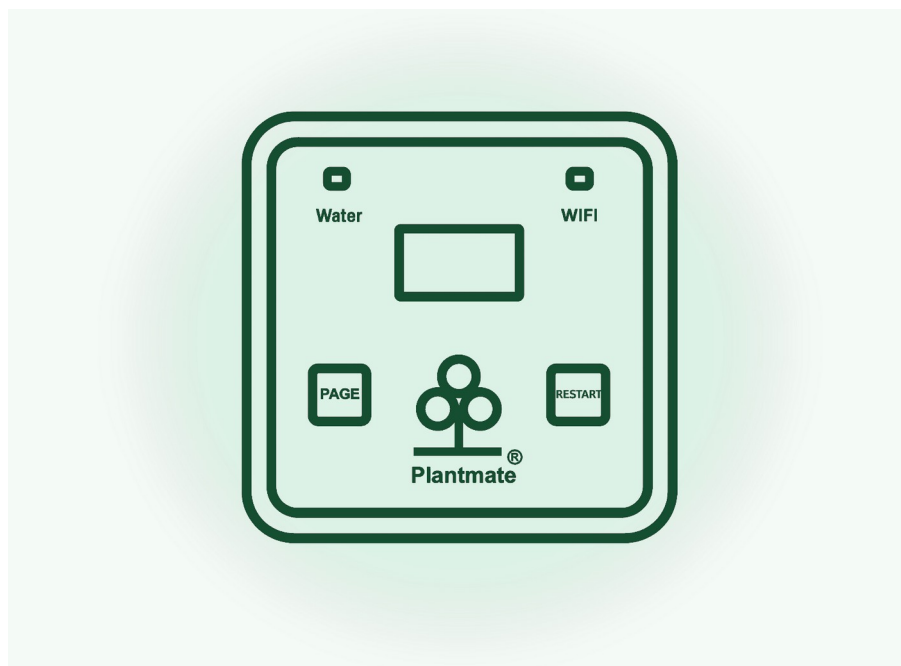


Plantmate® G2

Automatic Watering System

Model PMWC-02 | Firmware 5.0.1



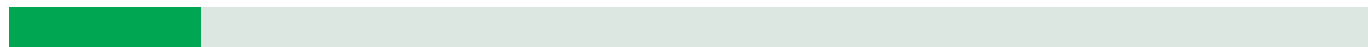
USER GUIDE

Two-zone sensor control and multi-plant Timer watering

Document version 2.2 - August 2026

Start Here

The fastest path from unboxing to the first safe watering test.



!	Watering is disabled when shipped. After setup, open Dashboard → Plants and enable each plant. A disabled plant will not water automatically or manually.
1	Assemble the hardware Install the water rings, sensors, tubing, and pumps. Keep the controller dry and place the water container below the pots.
2	Connect to Wi-Fi Connect the included USB-PD 9V adapter and USB-C cable, power the controller, join plantmate_Setup_XXXX, and enter your 2.4 GHz home Wi-Fi password.
3	Open the dashboard Use http://plantmate.local , scan OLED Screen 9, or enter the IP address shown on OLED Screen 1.
4	Set up and enable each plant Choose Sensor or Timer mode, check the flow settings, save, and switch the plant to enabled.
5	Run a supervised test Tap Water now while watching the tubing and pot. Stop immediately if a connection leaks or water is not reaching the soil.

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1 Product Overview

Plantmate G2 monitors up to two individual plants in Sensor mode and can water many plants in Timer mode.

Plantmate G2 is an ESP32-based automatic watering controller with two independent pump and sensor channels. In Sensor mode, each channel monitors one plant. In Timer mode, a pump line can be split through branch tubing and nozzles to water several pots. The built-in OLED screen provides at-a-glance information, while the local web dashboard provides setup, controls, charts, logs, and maintenance tools.

What it can do

- Monitor up to two individual plants in Sensor mode, or branch the pump lines to water many plants on Timer-mode schedules.
- Show temperature, humidity, ambient light, and soil moisture.
- Run either pump manually and stop it immediately when needed.
- Detect a likely empty tank, blocked tube, misplaced sensor, or failed watering attempt in Sensor mode.
- Store recent watering history and optionally log readings to a microSD card.
- Send optional Telegram alerts and accept owner-only commands from the configured chat.

What is in the box

Item	Quantity
PMWC-02 controller	1
Soil-moisture sensors	2
Submersible water pumps	2
Water tubing	2 lengths
Halo water rings	2
Support sticks	6
USB-PD 9V power adapter	1
USB-C cable	1
Quick Setup Guide	1

Before setup, prepare

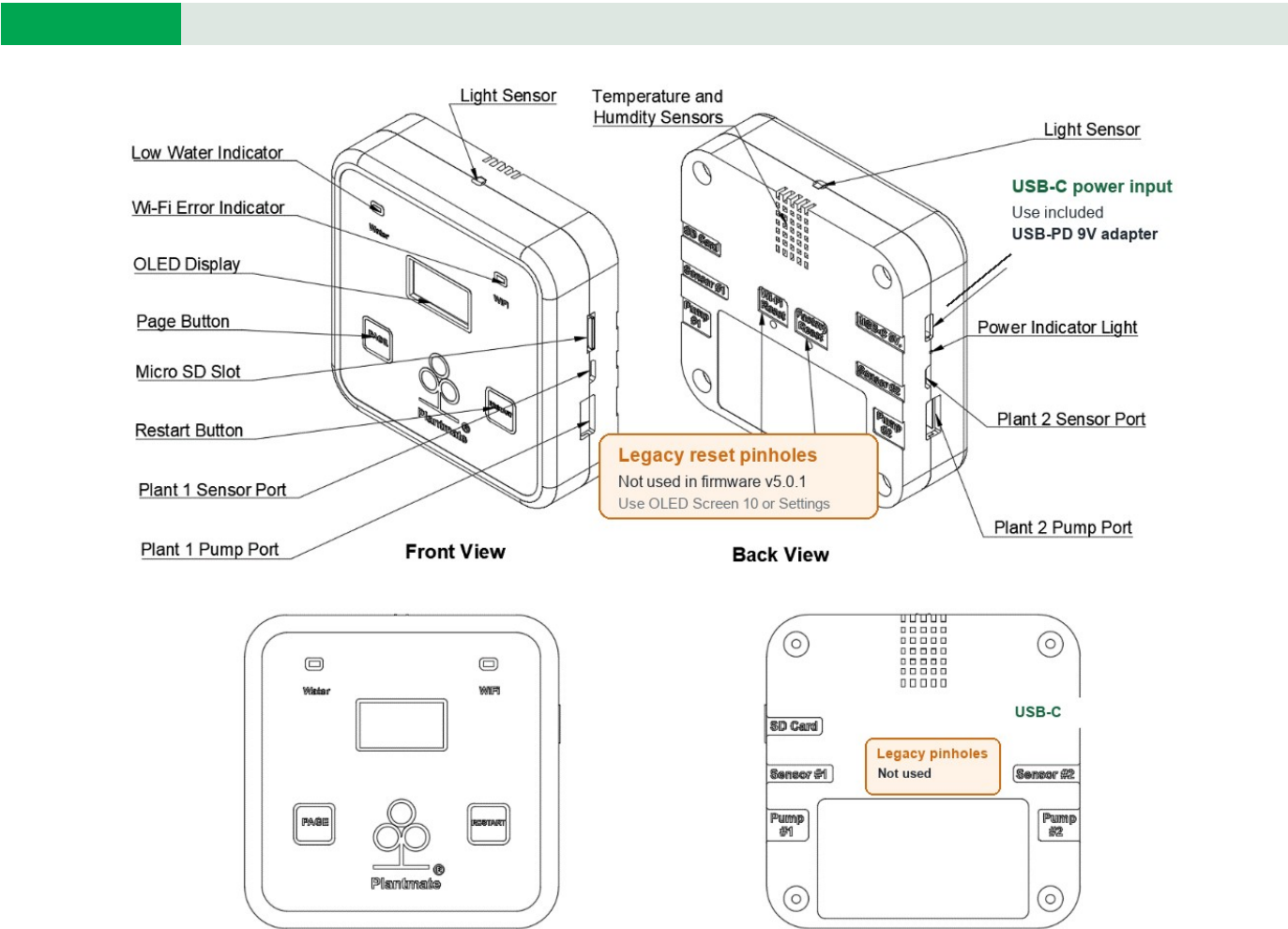
- A stable 2.4 GHz Wi-Fi network and a phone, tablet, or computer for setup.
- Use the included USB-PD 9V power adapter and USB-C cable. Do not substitute an unapproved power supply.
- A clean water container large enough to keep both pumps fully submerged.
- Scissors for cutting tubing. Optional: a FAT32 microSD card up to 16 GB.



Local access The web dashboard has no built-in login. Anyone connected to your home Wi-Fi can open it. Telegram provides optional alerts and owner-only commands over the internet when configured.

2 Device Overview

Controls, indicators, sensors, and connection ports.



The physical connector labels on your unit are the final reference. Plant 2 is on the left side of the system; Plant 1 is on the right.

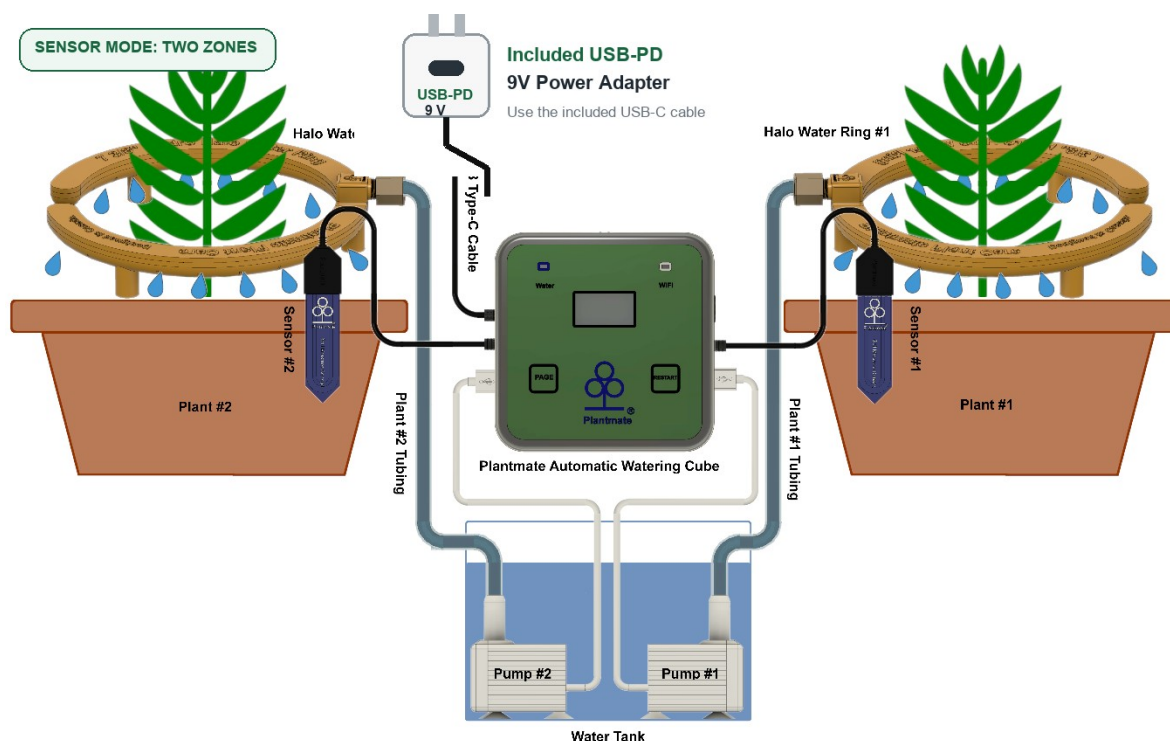
!

Firmware 5.0.1 reset method Use OLED Screen 10 for Reset Wi-Fi or Factory Reset. To reopen Wi-Fi setup quickly, disconnect power, hold PAGE, and reconnect power while continuing to hold PAGE. The rear reset pinholes are not required.

Part	Purpose
PAGE button	Wake the display; tap to move through screens. On Screen 10, tap to select and hold 4 seconds to execute.
RESTART button	Restarts the controller without erasing settings.
Water indicator	Blue blinking light means one or both plants are in a water-error state.
Wi-Fi indicator	White light is on while connecting, in setup mode, or offline; it turns off after connection.
Light sensor	Measures ambient light. Do not cover the small opening on top.
Temperature/humidity vent	Keep the rear vent unobstructed and away from direct water or strong heat sources.
microSD slot	Optional card for 60-second CSV sensor logging.
USB-C power input	Use the included USB-PD 9V adapter and USB-C cable.

3 Assembly

Complete the water connections before applying power.



Typical Sensor-mode arrangement for two independently monitored plants. In Timer mode, either pump line may be split to several pots. Keep the controller and all electrical connections above and away from water.

1	Install the water rings Insert three support sticks into each ring. Place each ring level on the soil with its outlet holes facing the soil.
2	Position the sensors Push each sensor into the active root zone near the water-ring outlets. Keep the connector and cable above the soil.
3	Connect the tubing Connect Pump 1 to Plant 1 and Pump 2 to Plant 2. Cut tubing to length, leaving gentle bends with no kinks.
4	Place the pumps Put both pumps in clean water and keep them fully submerged. Place the water container lower than the plant pots to reduce accidental siphoning.
5	Check before power Secure all tubing, dry the controller and connectors, and place a cloth nearby for the first test.
!	Sensor placement matters In Sensor mode, move the moisture sensor close to the nozzle or water-ring outlet so the 30-second check reaches the wetted area. A sensor placed too far away can cause a false WATER ERROR.

4 First-Time Wi-Fi Setup

The temporary setup network remains available for about three minutes.

1	Power on Connect the included USB-PD 9V adapter and USB-C cable. The OLED displays the startup log and then either connects to saved Wi-Fi or opens setup mode.
2	Join the setup network On your phone or computer, open Wi-Fi settings and connect to plantmate_Setup_XXXX. The final four characters identify your unit. No setup password is required.
3	Open the setup page A captive setup page should open automatically. If it does not, open a browser and enter http://192.168.4.1 , then choose Configure WiFi.
4	Select your home network Choose your 2.4 GHz Wi-Fi network, enter its password carefully, and select Save. The controller restarts and connects to that network.
5	Open Plantmate On a device connected to the same home Wi-Fi, use one of these methods: scan OLED Screen 9, enter http://plantmate.local , or enter the IP address on OLED Screen 1.

When setup does not finish

- If Screen 1 says Wi-Fi: NOT SET UP, hold PAGE for 4 seconds to reopen the setup network.
- Press RESTART and try again if the setup page stops responding.
- Use <http://>, not <https://>. The controller serves a local, unencrypted web page inside your home network.
- If plantmate.local does not resolve, use the numeric IP address shown on Screen 1.
- For multiple Plantmate units, rename each web address under Settings → Wi-Fi & name. After a rename, use the new .local address; the old address no longer works.

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Offline operation If Wi-Fi is unavailable, the OLED, sensors, and Sensor-mode watering continue to operate. Timer mode waits for a valid clock after startup. Local web control needs Wi-Fi; Telegram and time synchronization need internet access.

5 Web Dashboard and Plant Setup

The dashboard is served directly by the controller; no local app installation is required.

Set up each plant

1	Open Plants From the top navigation, select Plants, then choose Plant 1 or Plant 2. The physical pump and sensor numbers must match the selected plant.
2	Choose a name and icon Names appear on the web pages, OLED, and history. Short names are easiest to read on the OLED.
3	Choose the watering mode Sensor mode waters below a moisture target. Timer mode waters at a chosen local time every 1-30 days and does not use automatic threshold verification.
4	Review flow and duration Start with High flow and a short run, then adjust after watching a supervised watering test. Timer mode permits longer pump runs than Sensor mode.
5	Save and enable Save the settings, then switch Auto-watering on for that plant. Repeat for the second plant.
✓	Safe editing behavior Automatic watering is temporarily suspended while a Plants or Settings page is actively open. It resumes when you leave the page or after approximately 90 seconds without a settings-page heartbeat.

First supervised test

- Confirm the correct pump and ring are connected to the selected plant.
- Tap Water now. The pump begins with a one-second full-power kickstart, then uses the selected flow level.
- Watch the entire path for leaks, kinks, air locks, or a loose ring connection.
- Press STOP immediately if anything is wrong. A manual stop prevents that plant from automatically restarting for 10 minutes.
- If the tubing is empty, the first cycle may primarily prime the line. Recheck the water level and tubing before testing again.

5.1 Dashboard Pages

Four pages cover daily use, setup, history, and system options.

Page	What you use it for
Dashboard	Live temperature, humidity, light, plant moisture/status, Pause or Resume, Water all, and recent activity.
Plants	Name/icon, enable switch, Sensor or Timer mode, target or schedule, flow, duration, manual watering, and sensor tune-up.
History	7-day or 30-day moisture history, environment trends, recent watering events, statistics, and optional SD file browser.
Settings	System basics, Wi-Fi and web name, time, Telegram alerts, sensor offsets, SD storage, device info, update, and reset tools.

Dashboard status terms

Status	Meaning
WATERING	The pump is currently running.
SOAKING	The pump stopped and the controller is waiting 30 seconds before checking the soil again.
ERROR	Automatic Sensor-mode watering did not reach the configured moisture target after three attempts.
PAUSED	Global automatic watering is suspended.
OFFLINE	A sensor reading is implausible or the sensor is disconnected; Sensor mode will not trigger for that plant.

Pause, manual watering, and disabled plants

Pause/Resume controls global automatic watering. Plant enable switches control each plant separately. Manual Water now commands are accepted only for enabled plants. The Dashboard Water all button waters all enabled plants and is unavailable while the system is globally paused.

Changing the web address

Open Settings → Wi-Fi & name → Web address. Use letters, numbers, and hyphens. After saving, the controller restarts. Open the new address in the format `http://new-name.local`. Record the new name before saving.



Browser access tip A phone or tablet usually resolves .local names more reliably than some Windows browser setups. The IP address on OLED Screen 1 always provides a useful alternative while the address remains unchanged.

6 Watering Modes and Settings

Each pump channel can use a different mode and settings. Sensor mode monitors one plant per channel; Timer mode can distribute that channel to several pots.

Sensor mode

- When no pump is running, the normal soil display refreshes every 5 seconds.
- When moisture falls below the target, automatic Sensor mode begins a pump run and checks the soil about every 3 seconds.
- During those checks, the pump pauses briefly for a noise-free reading and stops early at the target plus 5 percentage points, capped at 100%.
- After the pump stops, the controller waits 30 seconds. The attempt succeeds at or above the original target; below it, the controller retries, up to three total attempts.
- Three attempts below the target create a WATER ERROR for that plant only. Manual and Timer runs remain single full-duration runs without Sensor-mode retries.

Timer mode

- Choose a local watering time and a calendar interval from 1 to 30 days.
- At or after the chosen time, watering becomes due when the selected number of calendar days has elapsed since the last Timer-mode watering.
- A Timer-mode pump line can be split with branch fittings to water several pots and nozzles. Moisture readings and empty-tank detection are not used to approve the result for any pot.
- An unknown clock at startup is never treated as due: automatic Timer watering waits safely for time synchronization. Saving Timer settings clears the prior schedule baseline; if today's chosen time has already passed, the plant may become due immediately.

Setting ranges and defaults

Setting	Purpose	Range	Default
Moisture target	Sensor mode trigger	0-100%	92%
Pump flow	Low ≈30%, Medium ≈60%, High full flow	Low / Medium / High	High
Sensor duration	Pump run after moisture trigger	3-30 s	8 s
Timer duration	Pump run at the scheduled time	3-300 s	8 s
Timer schedule	Local time and calendar interval	1-30 days	08:00 / 7 days



A practical starting point Use High flow with an 8-second run for the first supervised test. Then reduce flow or duration for small pots, slow-draining soil, or delicate watering rings. Plant needs vary, so observe the soil and adjust gradually.

7 Sensor Tune-Up and Water Errors

Factory calibration works immediately; tune-up improves accuracy for your sensor and water conditions.

When to tune up

- The displayed percentage seems consistently too high or too low.
- You use very sandy, very dense, or otherwise unusual potting media.
- Your water has high mineral content.
- A sensor has been installed for several months and readings have drifted.

Tune-up procedure

1	Open the wizard Open Plants, select the plant, expand Advanced, and select Start tune-up. You can also use Settings → Basics → Sensor tune-up.
2	Capture dry Remove the sensor, wipe it completely dry, and hold the sensing blade in air. Select This is dry and wait for the measurement.
3	Capture wet Dip only the sensing blade/tip into a glass of clean water. Keep the connector and cable dry. Select This is wet and wait for the measurement.
4	Save and reinstall The two readings are saved for that sensor and mapped to 0-100%. Reinstall it close to the water-ring outlets.

What causes WATER ERROR

In automatic Sensor mode, the controller starts below the target, checks about every 3 seconds, and may stop early at target plus 5 percentage points. After a 30-second settling period, moisture must reach the original target. Three attempts below the target stop that plant and blink the blue Water indicator. Common causes are an empty container, an unsubmerged or blocked pump, kinked tubing, a disconnected ring, or a sensor too far from the nozzle or water-ring outlet to detect the wetted area.

Clear the error

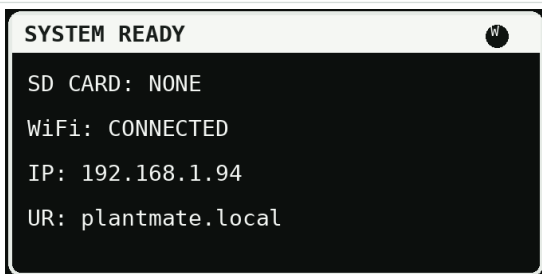
- Refill the container, inspect the pump, tubing, and ring, and move the moisture sensor close to the nozzle or water-ring outlet so it is inside the wetted area.
- Clear the error from the web error banner, start a manual Water now cycle, or send /clear through Telegram.
- Watch the next test. Do not repeatedly clear an error without finding the cause.



Manual and Timer limitation Manual and Timer runs do not use automatic threshold verification. Check the water supply and tubing because an empty tank may not create a water error during those runs.

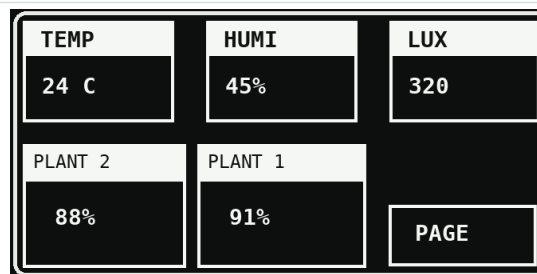
8 OLED Screen Guide

Tap PAGE to cycle. The first tap after display sleep wakes the screen without changing pages.



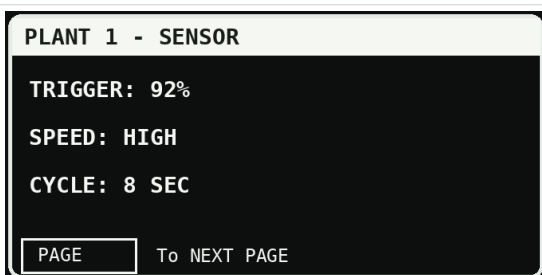
Screen 1 · System status

SD card, Wi-Fi, IP/web address, browser “W” indicator, and paused “P” badge.



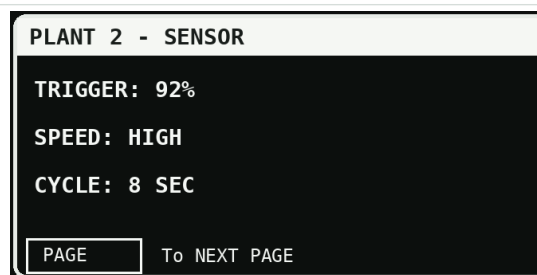
Screen 2 · Live sensors

Temperature, humidity, light in lux, and both plants’ current moisture or Timer/Offline status.



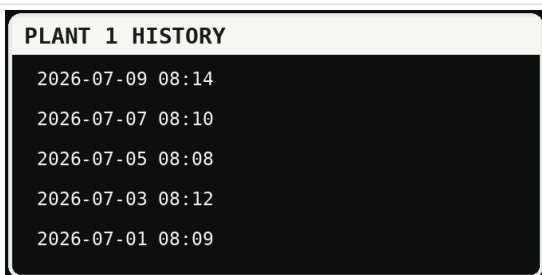
Screen 3 · Plant 1 settings

Plant 1 mode, target or interval, flow, duration, and next timer run.



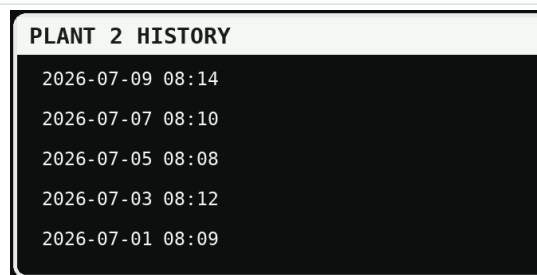
Screen 4 · Plant 2 settings

Plant 2 mode, target or interval, flow, duration, and next timer run.



Screen 5 · Plant 1 history

The five most recent Plant 1 watering timestamps.

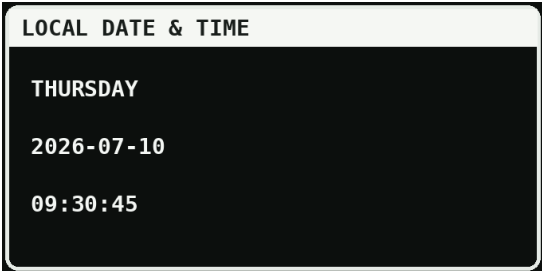
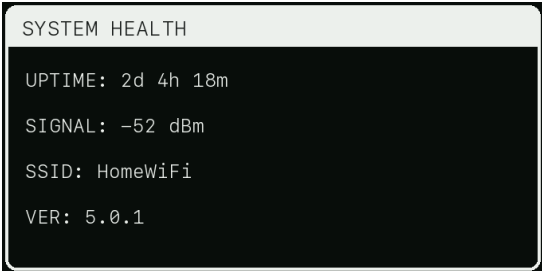
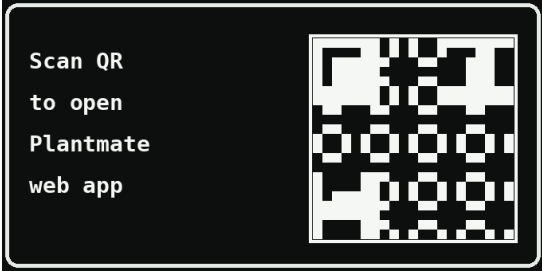


Screen 6 · Plant 2 history

The five most recent Plant 2 watering timestamps.

8.1 OLED, Button, and Indicator Details

The live sensor screen shows Plant 2 on the left and Plant 1 on the right. The following settings and history screens show Plant 1 before Plant 2.

	
Screen 7 · Local date and time Day, date, and time after internet synchronization and browser time-zone setup.	Screen 8 · System health Uptime, Wi-Fi signal, network name, and firmware version.
	
Screen 9 · Web app QR Scan to open the current local web address.	Screen 10 · Maintenance Reset Wi-Fi or perform a factory reset.

PAGE button behavior

Situation	Action
Screen asleep	Tap once to wake; the page does not change.
Screens 1-9	Tap to move to the next screen.
Screen 1, Wi-Fi not set up	Hold 4 seconds to restart Wi-Fi setup.
Screen 10	Tap to move between Reset Wi-Fi and Factory Reset; hold 4 seconds, then release when prompted.

Indicator lights

Indicator	Meaning
Blue Water LED blinking	At least one plant has a Sensor-mode water error. Inspect and clear the error.
White Wi-Fi LED on	The controller is connecting, waiting in setup mode, or offline.
White Wi-Fi LED off	Wi-Fi connection is established.

9 Optional Features and Updates

The core watering functions work without microSD or Telegram.

microSD logging

- Use a FAT32 card up to 16 GB; Class 10 is recommended.
- The device creates daily CSV sensor logs at 60-second intervals.
- History → SD card lets you browse, view, download, or delete files.
- Settings → Basics → SD card storage can format the card. Formatting permanently removes its logs.
- If the card is absent, OLED Screen 1 shows SD CARD: NONE and all main functions continue.

Telegram alerts and commands

Open Settings → Telegram app, follow the on-screen BotFather guide, and enter the bot token and chat ID. Choose water-error, watering-complete, sensor-offline, or daily-summary alerts. Quiet hours mute routine alerts; urgent water errors still pass through. Commands are accepted only from the configured chat ID.

Command	Action
/status	Current readings and quick-action buttons
/plants	List both plants and settings
/water1 or /water2	Water one enabled plant now
/waterall	Water every enabled plant
/pause /resume	Pause or restore automatic watering
/stop	Stop pumps immediately
/clear	Clear plant water errors
/help	Show the command list

Recent activity and saved history

Dashboard → Recent activity shows recent watering results and survives a normal restart. History stores the last five watering times for each plant and longer trend data. A factory reset or filesystem update clears on-device history, so download any needed SD logs first.

Firmware and filesystem updates

Open Settings → Basics → Firmware update. Upload only G2_firmware_*.bin for device firmware or G2_filesystem_*.bin for web pages. Keep power connected and do not close the page until the update finishes and the controller reboots. Both updates keep Wi-Fi and the saved plant settings. A filesystem update replaces web storage and clears recent on-device history.

10 Maintenance and Resets

Routine inspection prevents most watering failures.

Routine care

- Check the water level, tubing, ring holes, and pump inlets regularly.
- Use clean water. Flush tubing and rings when mineral deposits or algae appear.
- Keep the controller, USB-C connection, sensor connectors, and pump connectors dry.
- Wipe the controller with a dry cloth only after unplugging it.
- Review the sensor location after repotting, moving a ring, or changing soil.

Restart

Press RESTART or use Settings → Basics → Device info → Restart. Restarting does not erase Wi-Fi, plant settings, recent activity, or history.

Reset Wi-Fi

1	Choose a Wi-Fi reset method Power-up shortcut: disconnect power, hold PAGE, reconnect power while continuing to hold PAGE, then release after startup. Or open OLED Screen 10 and leave Reset Wi-Fi selected.
2	Execute the reset For the Screen 10 method, hold PAGE for 4 seconds and release when prompted. Either method clears only the saved Wi-Fi credentials and restarts Plantmate.
3	Set up Wi-Fi again Join the temporary plantmate_Setup_XXXX network and repeat Section 4. Plant profiles, calibration, and history remain stored.

Factory reset

1	Select Factory Reset On Screen 10, tap PAGE once so Factory Reset is highlighted.
2	Hold and confirm Hold PAGE for 4 seconds, then release when prompted.
3	Understand what is erased The controller stops the pumps, erases settings and on-device history, deletes SD log data, clears Wi-Fi credentials, and restarts in out-of-box setup mode.
!	Factory reset cannot be undone Download any SD logs you need and record plant, Telegram, and calibration settings before resetting.

11 Troubleshooting

Start with the symptom, then check the listed items in order.

Problem	What to check
Nothing waters	Confirm the plant is enabled, global watering is not paused, pump flow is not Off, and no water error is active. Test with Water now while watching the correct pump.
WATER ERROR but tank is full	Check that the pump is submerged, tubing is not kinked, and the ring is connected. Move the moisture sensor close to the nozzle or water-ring outlet so it is inside the wetted area. Clear the error only after correcting the cause.
Pump runs but no water arrives	Prime the tubing, check pump orientation/inlet, remove air locks, clean the pump and ring holes, shorten excessive tubing, and verify the correct pump port.
Soil reading is stuck or inaccurate	Reconnect the sensor, inspect its cable, move it away from pot walls or metal, reinstall in active soil, then run Sensor tune-up.
plantmate.local will not open	Use http://, confirm the phone/computer is on the same Wi-Fi, and enter the numeric IP from Screen 1. Restart the router or controller if the IP changed.
DNS_PROBE_FINISHED_NXDOMAIN	The .local name was not resolved. Use the IP address on Screen 1 and verify that mobile data/VPN is not forcing traffic away from the local network.
White Wi-Fi light stays on	The controller is connecting, in setup mode, or offline. Check Screen 1. Reset Wi-Fi and repeat setup if the saved network or password changed.
SD card missing or files unavailable	Use FAT32, reinsert the card with power safely managed, try a smaller supported card, free space, or format it from Settings after saving needed files.
Timer waters at an unexpected time	Timer mode uses a chosen local time every 1-30 calendar days. Check the time zone, watering time, day interval, and next-run display. Saving Timer settings clears the old baseline; if today's chosen time has passed, watering may become due immediately.
Web app pages are missing after update	Open http://device-address/update and upload the matching G2_filesystem_*.bin. Older filesystem_*.bin names are rejected.



Before contacting support Record firmware version, IP address, plant mode/settings, the exact OLED message, and what happened during a supervised manual watering test. Photos of the tubing and sensor placement are especially useful.

12 Safety, Specifications, and Support

Read these precautions before leaving the system unattended.

Safety and care

- Keep the main controller dry. Do not immerse it or place it where a leak or spill can reach the electronics.
- Unplug power before cleaning, moving tubing, handling connectors, or servicing pumps.
- Use the included USB-PD 9V adapter and USB-C cable. Do not use damaged cables, connectors, or an unapproved supply.
- Keep pumps submerged during operation, but do not immerse the controller, USB-C plug, or sensor connectors.
- Place the water container lower than the pots and secure tubing to reduce siphoning and accidental spills.
- Do not modify the controller or connect unapproved loads to the pump/sensor ports.
- Test the system while supervised after setup, calibration, repotting, maintenance, or any setting change.

Technical specifications

Item	Specification
Model	PMWC-02 · Plantmate G2
Firmware covered	5.0.1
Display	0.96-inch OLED, 128 × 64, automatic sleep
Plant channels	2 independent sensor/pump channels; each Timer channel can feed several pots through branch tubing
Sensors	Built-in temperature/humidity, ambient light, 2 capacitive soil sensors
Watering modes	Moisture threshold or scheduled local time every 1-30 days
Pump control	Low, Medium, High flow with 1-second full-power start
Sensor-mode run	3-30 seconds
Timer-mode run	3-300 seconds; local time; every 1-30 days
Connectivity	2.4 GHz Wi-Fi 802.11 b/g/n; local web app; optional Telegram
Storage	Persistent recent activity/history; optional FAT32 microSD up to 16 GB, CSV every 60 seconds
Power	USB-C power using the included USB-PD 9V adapter and USB-C cable

Support

Email: plantmateinfo@gmail.com

Website: www.plantmate.ca

Happy gardening!