



ILLUSTRATED INSTRUCTION MANUAL / SEPTEMBER 2026

Positive Pressure Turbine

Instruction Manual

pressure.local & one-icon setup | Requires firmware 2.9.4 or newer

Operation, pressure control, touchscreen gestures, Wi-Fi access from a phone, tablet or computer, web-app controls, settings and firmware updates.

One web-app address: <http://pressure.local>
Firmware 2.9.4 or newer required. Connect through the controller AP or your own Wi-Fi.
Direct AP network: CamperPressure-XXXXXX
AP password: ihatedust
Read the exact network suffix on the controller. Below version 2.9.4: see pages 16–17.

Find what you need

Section	Pages
Read first, everyday use and touchscreen controls	2–4
Web-app controls, direct AP access and your own Wi-Fi	5–8
pressure.local, one Home Screen icon and pressure calibration	9–11
Screen settings, stored settings and network recovery	12–15
Firmware updates, troubleshooting and source reference	16–19

Illustrations: browser-rendered from the supplied 2.9.2 portal HTML, with example readings and network names. The pressure.local and single-icon workflow follows the owner's 2.9.4 instructions. Newer portal changes remain unverified; labels may differ. Source details: page 19.

Before you operate

Understand what stops the fan, what resumes after a reboot, and what the pressure display can tell you.

The controller commands the turbine through an electronic speed controller (ESC). It reads an SDP810 differential-pressure sensor and offers fixed-speed modes or AUTO pressure control. The web app runs on the controller itself; it is not a cloud control service. [F1–F5]

Moving fan: isolate power before service

Keep fingers, tools and loose material away from the turbine. **OFF is a stop command, not electrical isolation.** Disconnect the appropriate power source before working on the fan, wiring or pressure plumbing.

Four operating rules

- 1. Activate OFF to stop.** On the web app, choose OFF, press **Select**, then **Activate selected mode**. On the awake touchscreen, swipe down from the top. Confirm the fan has stopped. A blank screen or closed browser does not stop it.
- 2. Expect operation after a normal reboot.** Startup applies the saved **Selected Mode**, even when it was not the Active Mode before power was removed. A fresh settings store defaults to selected AUTO. Select and activate OFF before a planned reboot when the fan must remain stopped. [F2]
- 3. Zero only at equal pressure.** The firmware automatically zeroes during startup while it commands the fan off. For manual zeroing, first activate OFF, wait for the fan and pressure to settle, and establish equal pressure at both sensing references. Zeroing does not stop the fan for you. [F2, F3, F5]
- 4. Treat manual PWM as an override.** The web-app arrows can change output even while the Active Mode label says OFF or AUTO. Activate a mode again to cancel the override. Merely selecting a mode does not cancel it. [F3, F5]

Pressure and sensor limitations

This firmware has **no automatic fan shutdown on a pressure-sensor read fault and no visible sensor-fault alarm**. A failed read can leave the last pressure value displayed while control continues. The web-app LIVE indicator confirms a status response, not sensor health. Stop and inspect the system when readings are implausible or fail to respond to a genuine pressure change. [F2–F5]

Do not use a green pressure display as proof of air quality or filtration performance. The source does not establish a certified safe pressure, enclosure leakage rate, fan power rating or air-quality protection level. Follow the installed hardware's power, mounting and service requirements.

Documentation basis: firmware source review, not a new hardware or safety validation. Source keys are listed on page 19.

Start, run and stop

The active mode determines normal operation. The selected mode is the mode waiting to be activated.

Starting the controller

- 1. Prepare the installation.** Check that the fan path and pressure references are unobstructed. Arrange equal pressure for startup zeroing; avoid other fans or strong drafts biasing the reference.
- 2. Apply the specified system power.** The splash screen progresses through **Arming ESC...**, **Starting sensor...**, **Zeroing sensor...** and **Starting Wi-Fi...**. ESC arming includes an approximately 1.5-second stop pulse; zeroing samples for about a second. A saved Wi-Fi connection may add up to about 12 seconds. [F1, F2]
- 3. Check the main screen.** Read the network name, AP or STA status and IP address in the top bar. Review pressure, target, PWM and the highlighted active mode. The saved selected mode activates automatically after startup.
- 4. Choose the required mode.** Use the touchscreen gestures on page 4 or the web controls on page 5. For AUTO, verify the target and the pressure reading before leaving the unit operating.

Operating modes

Mode	Normal behavior	Default output
OFF	Sends the ESC stop command.	880 us
VENT	Gentle fixed airflow. Starts with a brief motor-start kick.	1100 us for about 1 second, then 950 us
LOW	Fixed low-speed command; no pressure regulation.	1250 us
MED	Fixed medium-speed command; no pressure regulation.	1450 us
HIGH	Fixed high-speed command; no pressure regulation.	1800 us
AUTO	Adjusts output toward the saved Target Pa.	980–2000 us; factory target 3.0 Pa

PWM is a command pulse width, not measured fan RPM or a percentage of airflow. Actual speed depends on the installed ESC and turbine. Preset values above are firmware defaults; previously stored values can differ. [F1, F3, F6]

Stopping and leaving the unit

Activate **OFF** and verify that PWM returns to **880 us** and the fan stops. For a powered standby state, leave OFF selected and active. The screen may later turn black at its timeout, but the controller and web app remain running. Before a power cycle, remember that startup will zero the sensor again. [F2–F4]

Firmware references: F1–F4, F6. A restart during or after an update has separate behavior; see pages 16–17.

Touch gestures and display

A short tap activates the current selection. It does not directly choose the mode underneath your finger.

Gesture on the awake screen	Action
Swipe left / right	Moves the selected mode forward / backward through OFF, VENT, LOW, MED, HIGH and AUTO. It does not change the running mode.
Tap	Activates the currently selected mode. An intentional tap must last at least about 0.12 second.
Hold a mode tile for about 0.5 second	Directly selects and activates that tile. Release after it changes; keep your finger reasonably still.
Swipe down from the top edge	Selects and activates OFF. Start in the upper part of the screen.
Swipe up from the bottom edge	Requests sensor zeroing. Use only after OFF is active and the pressure references are equal.
Touch a dark screen	Wakes the display. Touch and release in the pressure-information area, then check the active mode before your next gesture.

Active versus selected tiles

The **active tile** has a bright filled background and white border. A different **selected tile** has a dim background with a colored outline. Swiping changes the outlined selection; a tap activates it. The mode color sequence is gray OFF, teal VENT, blue LOW, yellow MED, orange HIGH and purple AUTO. [F4]

Pressure card colors

Card color	Exact display rule
Blue	Pressure below -0.5 Pa.
Red	Pressure from -0.5 Pa to below +0.5 Pa.
Green	Pressure is at least +0.5 Pa and at least Target Pa minus 0.5 Pa.
Amber	Pressure is at least +0.5 Pa but still below Target Pa minus 0.5 Pa.

The small dot at the top right uses a separate rule: green at or above target minus 0.5 Pa; otherwise orange at zero or above; otherwise red. Neither indicator is a sensor-fault alarm. [F4]

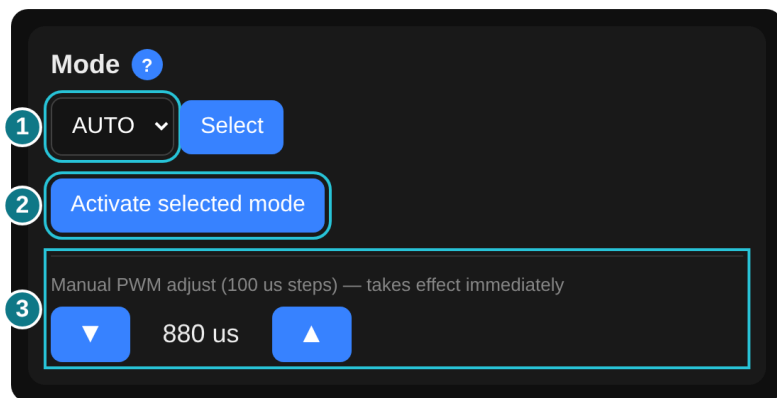
What the numbers mean

Pressure is the filtered, zero-corrected differential in pascals. **Target** is the AUTO setpoint. **Temp** is the pressure sensor's temperature, displayed in Fahrenheit, not a separate room thermostat. **PWM** is the current ESC command in microseconds. The scrolling header shows the active network and portal address. [F3, F4]

Firmware references: F3, F4. Screen timeout and orientation settings are on pages 12–13.

Read status, then activate

Use `http://pressure.local` in a web browser on a phone, tablet or computer through either local Wi-Fi connection (firmware 2.9.4 or newer).



1 Choose + Select

Choose a mode, then press Select to save the selection.

2 Activate

Press Activate selected mode to apply it to the fan.

3 Manual override

These arrows act immediately. Avoid them for normal setup.

Figure 1. Mode section: choose, Select, then Activate. Manual PWM is a separate override. [F5]

The live card at the top of the portal shows pressure, target, PWM, active mode, selected mode and temperature. The AP/STA examples on the connection pages show how to verify the network. [F5]

1. Choose a mode. Open the **Mode** drop-down, choose the desired mode and press **Select**. Confirm **Selected Mode** changes.

2. Make it run. Press **Activate selected mode**. Confirm **Active Mode** now matches the selection. To stop, perform both steps using OFF.

The status card refreshes about once per second while the page is active. Its LIVE dot flashes green after successful updates. **An old value can remain on screen after connection loss**; this version has no prominent disconnected banner. Check that the LIVE dot keeps flashing and verify the physical controller when in doubt. [F5]

Manual PWM arrows: advanced use only

Each press changes PWM by 100 us, within 880–2000 us, and overrides normal mode control. The mode labels do not announce this override. To restore normal control, select the desired mode and press **Activate selected mode**. [F3, F5]

Blue ? buttons expand help. Other sections are Auto Target, Wi-Fi, Screen, Firmware and Reboot. Firmware reference: F5.

Connect in AP mode

AP means the controller is providing its own Wi-Fi network. No router or internet connection is required.

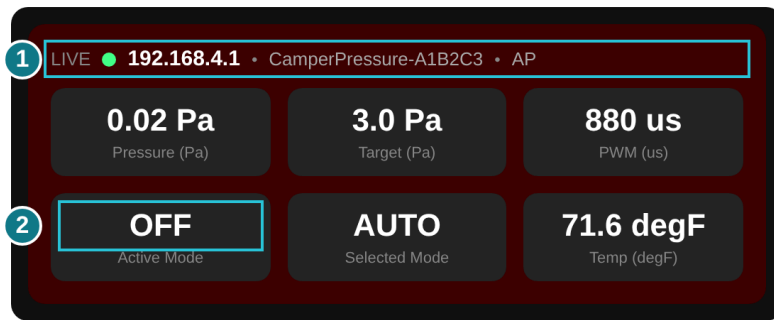
Direct connection details

Network: CamperPressure-XXXXXX | Password: ihatedust (lowercase)

Web app: <http://pressure.local> (firmware 2.9.4 or newer)

Before updating, or if the name fails: <http://192.168.4.1>

Read your unit's exact network suffix on its display. [F1, F5; U1]



1 AP + LIVE

Check the AP network name and address. Watch the LIVE dot flash as status refreshes.

2 Active vs selected

OFF is active in this example. AUTO is only selected; selecting alone does not start it.

Figure 2. Top of the portal in AP mode. Network suffix, readings and selection are examples. [F5]

1. Check that AP is active. Power the unit and wait for startup. With no saved Wi-Fi, AP starts automatically. If saved Wi-Fi cannot connect, fallback AP starts after the startup connection attempt. After a later Wi-Fi drop, allow about 12 seconds for fallback.

2. Join the controller's Wi-Fi. On your phone, tablet or computer, open **Wi-Fi settings**, select the displayed CamperPressure network and enter the password above.

3. Remain connected without internet. A **No Internet** warning is normal: this AP does not share internet access. If prompted, choose to stay connected to this network. Confirm that your device remains on the controller Wi-Fi.

4. Open a web browser. Enter <http://pressure.local> in the address bar, not a search box. On firmware older than 2.9.4, or if the name will not open, use <http://192.168.4.1>. Use your regular browser rather than an automatic Wi-Fi sign-in window.

5. Verify and operate. Check the web app's LIVE indicator, IP and network name. Use Select, then Activate selected mode. Save one pressure.local Home Screen icon using page 9.

AP is not always broadcasting

The controller prefers the saved Wi-Fi network and retries it, typically at 20-second intervals. When that network connects, AP turns off and the direct connection drops. Join the owner Wi-Fi on your device, then reopen <http://pressure.local> or the same saved icon. The displayed STA IP remains a fallback. [F1, F5; U1]

Return to direct AP use

From a reachable portal, activate OFF, then choose Clear Wi-Fi / Return to AP Mode and confirm. This clears network settings, not all settings. If STA is unreachable, use the recovery section. [F5, F6]

AP/STA baseline: F1, F5, F6. The pressure.local workflow requires 2.9.4 or newer [U1].

Connect through your router

STA means the controller has joined an existing Wi-Fi network. Your phone, tablet or computer must be able to reach it on that local network.

Use a **2.4 GHz-capable Wi-Fi network** with a network name and password. The ESP32-S3 radio uses 2.4 GHz Wi-Fi. This firmware provides no username, enterprise-certificate or browser-sign-in setup workflow. A private home, camper or travel-router network is the simplest configuration. [F5, S3]

The screenshot shows a dark-themed 'Wi-Fi' configuration screen. At the top, it says 'Wi-Fi ?'. Below this is the 'SSID' section, which includes a text input field containing 'MyCamperWiFi' (marked with a red circle 1), a 'Scan' button, and a list item showing 'MyCamperWiFi' with a signal strength indicator of '-49dBm'. Below the SSID section is the 'Password' section, which has a text input field with masked characters (marked with a red circle 2). At the bottom of the form is a 'Save & Reboot' button (marked with a red circle 3).

1 Choose a network

Press Scan and select your 2.4 GHz network, or enter its SSID.

2 Enter its password

Use the owner Wi-Fi password, not the controller AP password.

3 Save & Reboot

The controller restarts. Then join the owner network on your phone, tablet or computer.

Figure 3. Scroll to Wi-Fi: enter the owner network credentials and use Save & Reboot. [F5]

1. Open the portal in AP mode. Use the instructions on page 6. Before a setup reboot, select and activate OFF if the turbine must remain stopped.

2. Find Wi-Fi settings. Scroll to **Wi-Fi** and press **Scan**. Select your network to populate **SSID**, or type the SSID exactly.

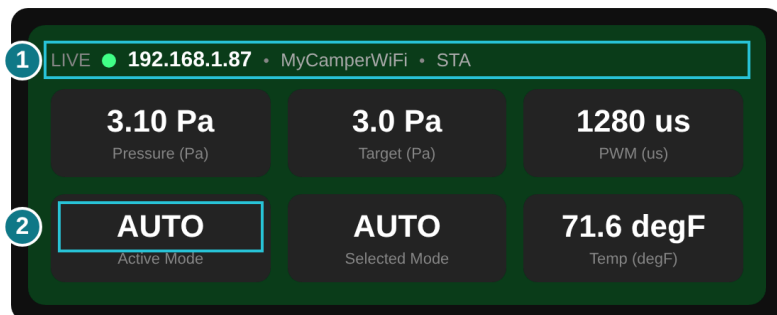
3. Enter the network password. Enter the password for your own Wi-Fi, not the controller AP password. **The password field is intentionally blank when the page loads.** Saving it blank overwrites the stored password with an empty password; re-enter it whenever using this form. [F5]

4. Save and restart. Press **Save & Reboot**. On a standard first setup, leave IP, Gateway and Subnet blank and leave **Lock DHCP assignment** enabled. Advanced IP fields use a separate save button.

After saving, continue with “Reconnect and confirm STA” on the next page. The AP disappearing is expected when the owner-network connection succeeds.

Reconnect and confirm STA

After Save & Reboot, move your phone, tablet or computer onto the owner Wi-Fi network.



1 STA connection

Look for your Wi-Fi name, STA and the local IP. Keep this IP as a fallback address.

2 Confirm operation

Check LIVE is updating, then verify the active mode and pressure. Example readings are shown.

Figure 4. Example STA status after joining MyCamperWiFi. Your actual network and IP will differ. [F5]

5. Confirm the controller joined. Wait for its header to show your network name, STA and an IP address. For example: CamperWiFi STA 192.168.1.87. Note the actual IP for troubleshooting; it is not the address to save for your icon.

6. Join that network on your device. Open **Wi-Fi settings** on your phone, tablet or computer and join the same owner network. The controller's AP disappearing after a successful connection is normal.

7. Open the same web-app address. Enter `http://pressure.local`, or open your saved pressure.local icon. Check LIVE, then use Select / Activate. If the name fails, use `http://` followed by the displayed STA IP; older firmware must be updated using pages 16–17.

What pressure.local does

It is the controller's local network name. On firmware 2.9.4 or newer, use the same name in AP mode and on your own Wi-Fi, even when the numeric IP changes. Save `http://pressure.local` for one bookmark or icon. Join the appropriate Wi-Fi first. If local name resolution fails, use the AP IP or displayed STA IP. Below version 2.9.4, update using pages 16–17. [U1, S4]

Local control works even when the router's internet service is down, as long as the local Wi-Fi connection still works. Hosted firmware checks require internet access from the controller. Internet loss alone does not force AP fallback. [F5, F7]

Network baseline: F1, F5–F7; radio: S3. Single-address workflow: U1; local name resolution: S4. Recovery and IP settings: pages 14–15.

One address. One icon.

Save `http://pressure.local` once. Use the same icon with direct AP Wi-Fi or your own Wi-Fi network after installing firmware 2.9.4 or newer.



Save this address: `http://pressure.local`

One icon for direct AP Wi-Fi and your own Wi-Fi. Connect to the correct local network before opening it.

Icon artwork from the supplied firmware; this is not a screenshot of an Apple menu.

Add to Home Screen on iPhone or iPad (optional)

- 1. Open the hostname in Safari.** Join the controller AP or the owner Wi-Fi. In Safari, enter `http://pressure.local` and wait for LIVE updates. Confirm the address shows `pressure.local`, not a numeric IP. Older than 2.9.4? Update first using pages 16–17.
- 2. Open sharing.** On iPhone, use Page Menu > Share, or the Share button when visible. On iPad, tap Share, then View More when needed. [S1, S2]
- 3. Choose Add to Home Screen.** Scroll through the sharing actions. If the action is missing on iPhone, use Edit Actions at the bottom of the list. [S1, S2]
- 4. Name the icon.** Use Positive Pressure or keep Positive Pressure Turbine. Enable Open as Web App when offered, then tap Add. [S1, S2]
- 5. Open the saved icon.** Stay on the appropriate local Wi-Fi, tap the new icon and check LIVE. After changing between AP and owner Wi-Fi, reconnect first, then use this same icon.

Why the same icon works in either mode

Save this address: `http://pressure.local`

AP mode: join CamperPressure-XXXXXX.

Owner Wi-Fi: join the same local network as the controller.

Then open the same Positive Pressure icon. No separate connection-mode icons are needed.

The icon stores the hostname rather than a fixed numeric IP, so an IP change does not require a new icon. It does not switch Wi-Fi, turn AP mode on, or provide remote control over the internet. The controller must be powered, reachable and resolvable on the connected local network. [U1, S4]

When the icon will not open

Check firmware 2.9.4 or newer, power and the connected Wi-Fi. Try `http://pressure.local` in a web browser. If only a numeric IP works, use that for diagnosis and check local name resolution or network isolation; keep the hostname icon. Reopen it after local access is restored.

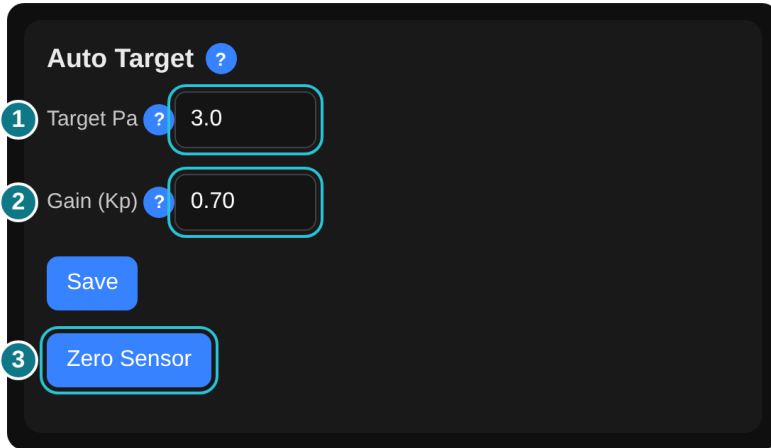
Replace an older IP-based icon once

After `pressure.local` opens successfully, remove the old IP-based shortcut and add the hostname icon above. Use Safari itself, not the automatic Wi-Fi sign-in window. Do not save the numeric fallback as your new app icon.

Access workflow: U1; local name resolution: S4. Apple Home Screen steps: S1, S2, checked 22 September 2026. Menu wording varies by layout.

Set AUTO and zero the sensor

Set the pressure reference correctly before trying to tune the fan response.



1 Target pressure

Set the AUTO pressure goal. The source default is 3.0 Pa.

2 Gain (Kp)

The source default is 0.70. Save both values with Save.

3 Zero Sensor

First activate OFF and equalize both pressure references. Zero does not stop the fan.

Figure 5. Auto Target: Target Pa, Gain (Kp), Save and Zero Sensor. Source defaults are shown. [F5]

Set the AUTO target

1. Open Auto Target. In the web app, scroll to **Auto Target**. Start with the firmware defaults: **Target Pa 3.0** and **Gain (Kp) 0.70**, unless an installer has specified different settings. Existing saved values are retained. [F1, F6]

2. Save the values. Enter the target and gain, then press **Save**. These values persist through reboots. Saving does not activate AUTO; it changes the settings used by AUTO. If AUTO is already active, the new settings take effect during operation.

3. Activate and observe. Select AUTO, press **Select**, then **Activate selected mode**. Check that pressure responds in the intended positive direction. Do not assume that a higher setpoint is safe for every enclosure.

AUTO increases or decreases the command according to target minus measured pressure. Gain controls the size of each incremental adjustment; lower positive gain softens the response. The output is limited to **980–2000 us**. A nominal **0.30 Pa deadband** and integer rounding are used; this is not a guaranteed ± 0.30 Pa regulation accuracy. AUTO does not stop the fan just because the target is met. [F3]

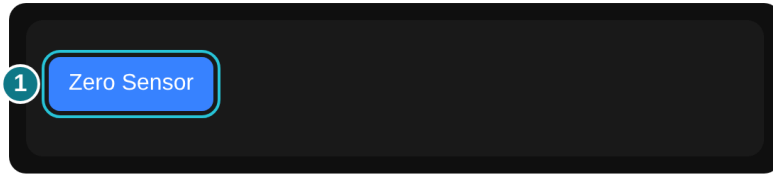
Settings are not validated against an installation-safe range

The target and gain inputs have no firmware-enforced minimum or maximum. Avoid negative gain and arbitrary large values. If operation is unstable, activate OFF and review sensor plumbing, zero and the installation before changing tuning. [F5]

For a manual zero, first stop and equalize the pressure references. Follow the complete procedure on the next page.

Zero only at equal pressure

Zero Sensor is in Auto Target. It does not stop the turbine before taking its measurement.



1 Manual zero

Use only after OFF is active and both sensing references are at equal pressure.

Figure 6. Zero Sensor is a measurement command, not a stop command. [F3, F5]

Manual zero procedure

- 1. Stop the turbine.** Select OFF, press Select and Activate selected mode, or swipe down from the top of the awake screen. Confirm the fan has stopped.
- 2. Equalize the pressure references.** Allow the pressure to settle and establish the same pressure at both sensing references. Other fans, wind and a genuinely pressurized enclosure can bias zero. An installer may need to equalize the sensing ports directly.
- 3. Request zero.** Press **Zero Sensor** in Auto Target, or swipe up from the bottom edge of the touchscreen. Keep conditions steady for about one second while the firmware collects 100 attempted samples. [F2, F3]
- 4. Verify, then resume.** Check for a reading close to zero. Restore the intended enclosure configuration, activate the desired mode and confirm the reading responds. If it does not, leave the unit OFF and investigate.

Zero is held only until the next restart; the controller calibrates again during each startup. The zero command has no built-in fan-stop interlock and no explicit success/failure message. Do not use zero to hide a real pressure problem or a reversed pressure reference. [F2, F3, F5, F6]

Firmware references: F1–F3, F5, F6. AUTO may not reach target if available airflow is insufficient; it can remain at its upper command limit.

Stop → equalize → zero → verify

Do not zero an enclosure that is genuinely pressurized or use zero to disguise a reversed pressure reference. If readings remain implausible, leave the fan OFF and inspect the installation.

Screen settings and stored values

Use the web app’s Screen section. Settings apply only after you press Save Screen Settings.

Screen ?

Brightness (0–255)

1

255

Screen Timeout (seconds, 0 = never)

2

60

☐ Rotate screen and touch 180 degrees

3

Save Screen Settings

1 **Brightness**

Move the slider to adjust the controller display.

2 **Timeout**

Enter seconds; 0 keeps the display on.

3 **Save Screen Settings**

Rotation also applies to touch. Press Save to apply these settings.

Figure 7. Screen settings: adjust the values, then press Save Screen Settings. [F5]

Setting	Default	How it works
Brightness	255	The normal web slider offers 10–255 in steps of 5, despite its 0–255 label. Saving applies the new brightness immediately.
Screen Timeout	60 seconds	Set 0 to keep the display on. The input offers 0–3600 seconds in steps of 5. Timeout blanks the display only; it does not turn off the fan or Wi-Fi.
Rotate screen and touch 180 degrees	Unchecked	Unchecked is the 2.9.2 baseline orientation, already rotated 180° from original FINAL17 2.9.0. Checking the box flips it back. Display and touch rotate together.

Move the brightness slider, enter the timeout and set rotation, then press **Save Screen Settings**. No reboot is required. Normal touch activity restarts the display timeout; ordinary web-app viewing does not. Saving Screen settings wakes the display and restarts its timer. [F4–F6]

Screen timeout only blanks the display. It does not stop the fan or disable local web control. Stored values and reboot behavior are explained on the next page. [F4–F6]

INSTRUCTION MANUAL | ILLUSTRATED EDITION | 2.9.4+

12

Stored values and reboot

A normal restart does not erase the saved configuration. Read the selected mode before restarting.

What is remembered?

Item	Persistence in this firmware
Active and selected modes	Both are stored, but normal startup activates the stored selected mode. Selecting alone can therefore affect the next restart.
Target Pa and Kp	Saved by the Auto Target Save button.
Owner Wi-Fi and IP settings	Saved through their respective forms. Clear Wi-Fi removes network credentials, manual IP fields and the learned DHCP address.
Screen brightness, timeout and rotation	Saved by Save Screen Settings.
Sensor zero	Not saved to nonvolatile storage; measured again at startup.
Temporary manual PWM override	Not saved. Activating a mode or restarting clears the override.
Manual speed presets	The source can load stored VENT / LOW / MED / HIGH presets, but this web app has no preset-edit form. Its PWM arrows are temporary, not preset saving.

Reboot is not a factory reset



1 Normal restart

Reboot keeps saved settings. Select and activate OFF first when the fan must stay stopped.

Figure 8. Reboot restarts the controller; it is not a factory-reset command. [F5]

In the reviewed 2.9.2 interface, Reboot retains settings and Clear Wi-Fi / Return to AP Mode clears only network settings. That interface has no full factory-reset button or gesture. Any factory-default changes in 2.9.4 still require source verification. [F2, F5, F6]

Firmware references: F2, F4–F6. Existing installations may retain earlier brightness, rotation, target or mode preferences after a firmware update.

IP settings, recovery and access

Use pressure.local for everyday access. Keep the displayed IP for recovery; a Wi-Fi association alone does not prove that stored IP settings are correct.

IP Address ?

1 ☒ Lock DHCP assignment (recommended)

2 IP:

Gateway:

Subnet:

3

1 DHCP lock

Enabled by default; reuses the learned address. This is not a router-side reservation.

2 Manual fields

Leave IP, Gateway and Subnet blank for normal setup.

3 Save + restart

This separate save button applies the IP settings and clears the learned DHCP address.

Figure 9. IP Address is below the Wi-Fi credentials form and has its own Save IP Settings & Reboot button. [F5]

Choose an addressing method

Method	Configuration and result
Lock DHCP assignment Default: enabled	Leave IP, Gateway and Subnet blank. The first router-issued address, gateway, subnet and DNS are stored and reused for that SSID. This is device-side reuse, not a reservation created in your router. It cannot guarantee the router will not assign the address elsewhere.
Ordinary DHCP	Leave the manual fields blank and uncheck Lock DHCP assignment. Press Save IP Settings & Reboot. The router can assign a different IP on a later connection.
Manual static IP	Enter IP, Gateway and Subnet together. All must be valid IPv4 entries. A manual static configuration overrides DHCP locking; the firmware uses the gateway as DNS. Coordinate the address with whoever manages the router.

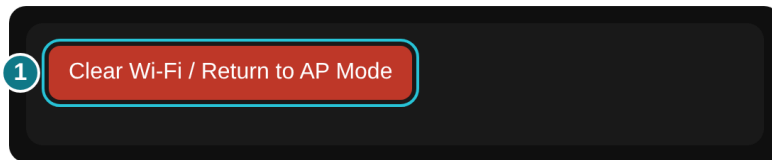
Save IP Settings & Reboot clears the learned DHCP address. For a fresh lock, leave all three manual fields blank, keep the lock checked and save. Reopen pressure.local; retain the displayed STA IP as a fallback. Changing only SSID/password does not clear old static-IP fields. [F5, F6; U1]

Recover local access

Keep using the same hostname icon after recovery. Use the numeric address to diagnose a connection problem.

Recover from a wrong or unreachable STA address

- 1. Check the simple causes.** Confirm your device's network and the controller's displayed address. Try the main trusted Wi-Fi rather than an isolated guest network. Temporarily pause a VPN only as a diagnostic if it may block local access.
- 2. Create a real Wi-Fi disconnect.** If the controller still says STA but cannot be reached, temporarily turn off or move out of range of its saved access point. Wait about 12 seconds for fallback AP. Wrong IP settings alone may not trigger fallback because Wi-Fi can still be associated. [F5]
- 3. Repair through AP.** Join CamperPressure-XXXXXX and open `http://pressure.local`; use `http://192.168.4.1` if needed. Keep the old access point unavailable while making changes. Activate OFF, then clear manual IP fields and save the addressing method, or use Clear Wi-Fi / Return to AP Mode.
- 4. Reconnect deliberately.** Restore the router and join the intended network. Reopen `http://pressure.local` or the same saved icon. No new icon is needed for an IP change. Replace an older numeric-IP icon once using page 9. [U1]



1 Return to direct AP

Clears saved network settings and reboots. It is not a full factory reset.

Figure 10. Clear Wi-Fi / Return to AP Mode clears the saved network configuration. [F5, F6]

Access and security boundaries

The reviewed 2.9.2 portal has no administrator login; reachable clients can control or update it. Its AP password is fixed. Use trusted local networks and do not port-forward the portal. AP internet sharing and cloud control are absent from that baseline. A local hostname does not create remote access. [F1, F5, F7; S4]

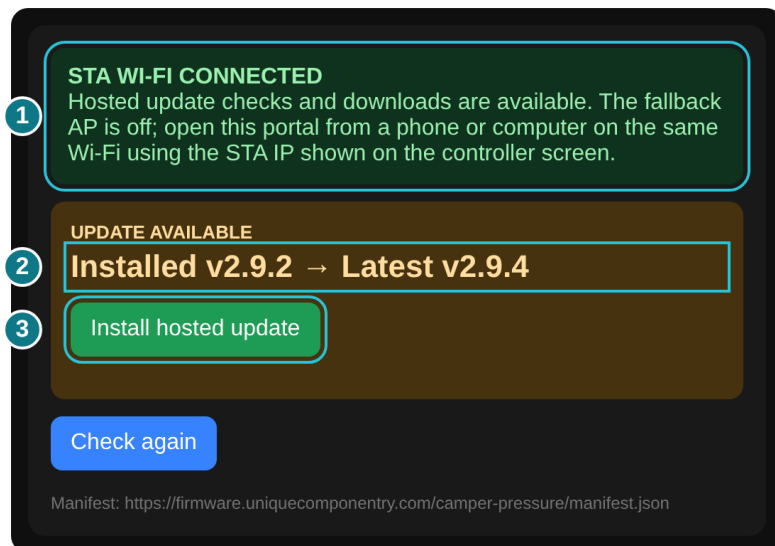
Firmware references: F1, F5–F7. Router-side reservation and conflict management are separate from the firmware's DHCP-lock option.

The reviewed firmware has no dedicated force-AP touchscreen gesture. Create a real Wi-Fi disconnect to trigger fallback, as described above. [F4, F5]

Update through the web app

This guide requires firmware 2.9.4 or newer. Update only if your version is older. Use an official application .bin for this controller.

Open the portal by numeric IP: `http://192.168.4.1` on AP, or the displayed STA IP on your own Wi-Fi. Open Firmware > Updates & Upload; read the installed version/build and OTA readiness. [F7]



1 Controller connection

Hosted checks require internet access through the owner Wi-Fi.

2 Compare versions

Example only: installed 2.9.2, offered 2.9.4. Actual release details will vary.

3 Install hosted update

Review the offered release, then confirm installation. Keep power connected.

Figure 11. Hosted-update controls. Example only: upgrading from 2.9.2 to 2.9.4; release availability is not a live check. [F7]

Before either update method

Use stable power, remain near the controller, and leave the update page open until a success or failure result. The update procedure stops the fan and stores **OFF as both active and selected** before writing firmware. Do not expect the former running mode to resume afterward. [F7]

Method A: hosted OTA update

1. Connect the controller to internet-capable Wi-Fi. Open its STA portal address in a browser on your phone, tablet or computer on the same local network. A STA label confirms Wi-Fi connection, not successful internet access.

2. Read the update result. Opening the Firmware page normally checks the hosted source, with repeat automatic checks limited to about once per minute. Press **Check again** for another attempt. The source is fixed to `firmware.uniquecomponentry.com`.

3. Install version 2.9.4 or newer when offered. Check the offered version and notes, press Install hosted update, and confirm. Keep power connected until the result and restart. A release below version 2.9.4 does not meet this guide's minimum requirement.

Status	Meaning
CURRENT	The installed version matches the version returned by the hosted manifest.
INSTALLED VERSION IS NEWER	The hosted version is older; this is not an update failure.
STATUS UNAVAILABLE / CHECK FAILED	The controller could not make a valid comparison. Check its internet connection and the page's error text; do not assume it is current.

Install a saved firmware file

A locally saved official application .bin can be uploaded while connected directly to the controller AP.

Upload compiled firmware

Download the latest official firmware from firmware.uniquecomponentry.com, then select the downloaded .bin file below. Upload only the official firmware .bin file. Do not upload bootloader, partition, merged, or filesystem files.

1 Download Latest Firmware

2 Choose File No file chosen

3 Upload and install

Keep power connected and leave this page open until the controller reports success and reboots.

1 Get the file first
Download the official application .bin while you have internet access.

2 Choose the .bin
Select the locally saved firmware file. Do not choose a ZIP or bootloader.

3 Upload and install
Confirm, then wait for success and restart. 100% upload alone is not completion.

Figure 12. Upload compiled firmware: download first, choose the .bin, then Upload and install. [F7]

Method B: local .bin upload, including AP mode

- 1. Obtain the correct file first.** Use **Download Latest Firmware** while internet access is available. For AP-only installation, save the official application .bin locally before joining the controller AP. Do not select a ZIP, bootloader, partition, merged-image or filesystem file.
- 2. Upload from the controller's Firmware page.** Under **Upload compiled firmware**, choose the .bin and press **Upload and install**. Confirm and wait. Upload progress reaching 100% is not enough; wait for the installation-success message and restart.
- 3. Verify version 2.9.4 or newer after restart.** Reconnect using the screen's AP or STA details and reopen the numeric-IP portal. Confirm the installed version, check settings and pressure zero, then activate the desired mode. Open <http://pressure.local> and save the single icon using page 9.

If **OTA partition not found** appears, an installer must perform a USB flash with the supplied Custom partition table and 16 MB flash configuration. Repeated local uploads cannot add a missing OTA partition. On any failed update, read the error and verify the controller's actual version and mode before retrying. [F7]

Steps verified against the 2.9.2 updater [F7]; 2.9.4 source review is pending. Confirm the installed version, not merely CURRENT. Hosted availability is unverified.

When something does not behave as expected

Begin with the physical controller's current network, IP address, active mode and PWM.

Symptom	Check / corrective action
No CamperPressure network	If the header says STA, AP is off. Join the owner Wi-Fi and open pressure.local, or use its displayed STA IP. If saved Wi-Fi is unavailable, allow the fallback delay. Check power and range.
No Internet warning on direct Wi-Fi	Normal for this AP. Stay connected and open http://pressure.local on 2.9.4 or newer. Use http://192.168.4.1 before updating or if the name fails. This baseline has no AP internet pass-through.
Portal fails after Save & Reboot	If STA connected, join the owner Wi-Fi and reopen pressure.local or the same icon; use the displayed STA IP if needed. If AP returned, check SSID/password and 2.4 GHz availability.
Own Wi-Fi will not connect	Re-enter the complete password; a blank password submission does not preserve the old one. Check range and old manual-IP settings. This portal does not configure enterprise or browser-login credentials.
pressure.local or saved icon fails	Confirm 2.9.4 or newer (update: pages 16–17), power and correct Wi-Fi. Try pressure.local in a browser. If only numeric IP works, check local name resolution/network isolation. Replace old IP-based icons once (page 9).
Mode selected but fan unchanged	Press Select, then Activate selected mode. On the touchscreen, swipe then tap, or hold the intended mode tile. A short tap activates the current selection, not necessarily the tile touched.
Fan runs with OFF label / AUTO seems fixed	Manual PWM override may be active. Select and activate OFF to stop, or activate the desired mode to restore normal control. Do not rely on the mode label alone during override.
Fan starts after a reboot	Normal startup activates the saved selected mode; a fresh settings store selects AUTO. Activate OFF before a planned restart when no operation is wanted.
Black or upside-down screen	Touch and release in the pressure-information area to wake. Check Screen brightness, timeout and rotation in the portal. In 2.9.2 the default rotation checkbox is unchecked.
Pressure stays near zero, negative or stale	Activate OFF. Check equal-pressure zero, sensor tubing/reference direction, blockage, wind and sensor connection. Do not keep zeroing away a real differential. There is no sensor-fault shutdown or visible sensor-fault alarm.
AUTO reaches maximum / pressure hunts	Verify zero and the pressure references first. Check enclosure leakage, filter/air path and the target. For oscillation, try a smaller positive Kp cautiously and observe. Output limits do not guarantee the target can be achieved.
Firmware check or upload fails	Check the detailed error, stable power, local network, correct .bin and OTA-partition readiness. Hosted checks require controller internet access; a saved local .bin can be uploaded over AP without it.

Firmware references: F1–F7. If the problem remains, record firmware/build, network mode/IP, active and selected modes, PWM, pressure and the exact error for the installer. Do not share Wi-Fi passwords in support screenshots.

Firmware details and source basis

The operating reference below remains the verified 2.9.2 source. The minimum-version access notice is not a substitute for review of the newer source.

Reference item	Value in the supplied source
Firmware / build	2.9.2 / FINAL17 BASELINE ROTATED
Target hardware / pressure sensor	Waveshare ESP32-S3-Touch-LCD-3.5B / SDP810 at I ² C 0x25
Signal pins (installer reference)	ESC: GPIO17. Dedicated sensor bus: SDA GPIO48, SCL GPIO47. These are the active constants, not stale comments in the sensor file.
Default control settings	Target 3.0 Pa; Kp 0.70; nominal deadband 0.30 Pa; 10-reading moving average; nominal sensor and control interval 20 ms.
Default speed commands	OFF 880; VENT 950; LOW 1250; MED 1450; HIGH 1800 us. AUTO limits 980–2000 us.
Default screen / networking	Brightness 255; timeout 60 s; rotation unchecked; DHCP lock enabled. No saved owner Wi-Fi on a fresh settings store.
Included OTA layout	16 MB flash layout; two 0x640000-byte (6.25 MiB) application slots. Actual device layout must match for OTA use.

Firmware source keys used in this manual

Operating source: CamperPressureController_FINAL17_2.9.2_BASELINE_ROTATED.zip. The newer CamperPressure_DNS_Reset_2_9_4.zip remains unreviewed. [U1] Owner-specified access workflow: firmware 2.9.4 provides pressure.local for AP and owner Wi-Fi, with one saved hostname icon.

- [F1] app_config.h, lines 5–66; app_state.h, lines 24–87. Identity, pins, constants and defaults.
- [F2] Main.ino, lines 27–96 and 110–134. Startup, saved selected-mode activation, zeroing and sensor-fault handling.
- [F3] control.cpp, lines 16–108; sensor_sdp.cpp, lines 47–114. Modes, override, AUTO control and calibration.
- [F4] app_ui.cpp, lines 371–461 and 467–552. Gestures, sleep, display values and colors.
- [F5] network_portal.cpp, lines 163–293 and 324–1010. AP/STA transitions, web metadata, UI, status, Wi-Fi and control forms.
- [F6] storage_prefs.cpp, lines 8–95; network_portal.cpp, lines 1011–1035; lcd_bsp.cpp, lines 123–133. Persistence and screen settings.
- [F7] network_portal.cpp, lines 1038–1541; partitions.csv. Hosted/local update workflows and OTA layout.

External references

- [S1] [Apple: iPhone Safari web-app / Home Screen instructions](#)
- [S2] [Apple: iPad Safari web-app / Home Screen instructions](#)
- [S3] [Espressif: ESP32-S3 Wi-Fi radio capability](#)
- [S4] [Espressif: mDNS local-network hostname resolution](#)

External guidance checked 22 September 2026. All portal images are illustrative source-based browser renders, not live hardware captures. This document is not a bench-test report or a specification of the assembled turbine's electrical, mechanical or filtration limits.