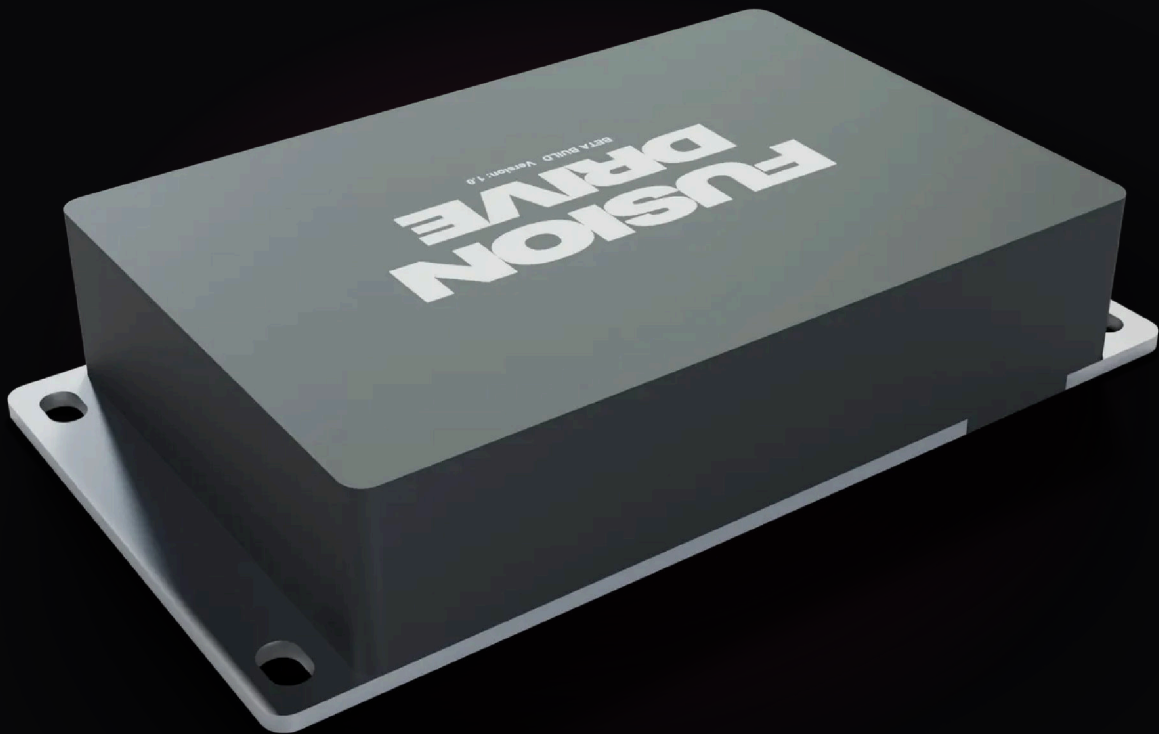


Trouble-shooting

Hardware and connectivity problems organised by what you see, the likely causes in the order worth checking, and the fix. Plus how to send a support report from the app.



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— SUPPORT

Troubleshooting

Hardware and connectivity problems, organised by what you see. Each section lists the likely causes in the order they are worth checking, then the fix.

Covers the controller, harnesses and phone connection For app features see the [app manual](#)

1 Before anything else

Nine out of ten installation problems are one of these. Check them first, whatever the symptom.

- ☐ Both **GND** leads on Harness B are on bare metal, and the controller's base plate is bolted down
- ☐ All three plugs are latched: press each one home until it clicks
- ☐ The 30 A fuse at the battery is intact and the **BATT+ 30A** ring terminal is tight
- ☐ The vehicle's OBD socket fuse is intact (it often shares a fuse with the cigarette lighter or the radio)
- ☐ The phone has Bluetooth on and the FusionDrive app has Bluetooth permission (iPhone Settings → FusionDrive)
- ☐ The app and firmware are current



WHERE TO LOOK IN THE APP

The controller has no external lights: its status is shown in the app. *Connection* shows whether the controller is found and connected. *More → Outputs* shows whether the dedicated 12 V feed is present. *More → Diagnostics* shows the controller's own log, sleep history and sensor health. Most of the checks below refer to those three screens.

2 No power / controller never appears

Likely cause	How to check	Fix
OBD socket not powered	Measure between OBD socket pin 16 and pin 4 with a multimeter: expect battery voltage. Try another OBD device.	Replace the vehicle fuse that feeds the diagnostic socket. On vehicles where the socket is only live with the key on, fit the dedicated feed or the IGN lead.
Harness A not fully seated	The OBD plug should be pushed fully into the socket; the 4-way plug should have clicked into the controller.	Re-seat both ends.
Controller is asleep	With the key off and no bus traffic the controller sleeps after about a minute and is invisible to the app.	Turn the ignition on. It wakes instantly on CAN traffic or the IGN lead.

Likely cause	How to check	Fix
Dedicated feed only, no ground	If the controller is powered only from BATT+ (no OBD), a missing ground means no power at all.	Connect both GND leads to bare metal. Check the 30 A fuse at the battery.
Reversed BATT+ / GND	Check polarity at the leads with a meter.	Correct the wiring. If the controller then still does not power up, contact support: reversed power can damage it.
Internal 30 A fuse open	Dedicated 12 V shows as <i>not present</i> in the app even though there is 12 V on the BATT+ lead and grounds are good.	Something drew more than 30 A through the outputs, usually a shorted load. Find and fix the short and fuse the load, then contact support for fuse replacement. Do not open the enclosure yourself while under warranty.

3 Won't pair / not found in the app

1 Confirm the controller is awake.

Ignition on, or engine running. A sleeping controller does not advertise.

2 Check the phone.

Bluetooth on, FusionDrive allowed to use Bluetooth in iPhone Settings, and no other phone currently connected to the controller. Only one phone connects at a time.

3 Get closer.

For the first connection sit in the car within a couple of metres of the controller.

4 Identify it.

The controller appears under its serial number (printed on the unit) until you give it a name in the app. If there are several FusionDrive units nearby, match the serial.

5 Do not pair in iPhone Settings.

FusionDrive connects from inside the app. If you previously added it in iPhone Settings → Bluetooth, tap the ⓘ and *Forget This Device*, then connect from the app.

6 Restart both ends.

Close and reopen the app; switch the ignition off, wait two minutes for the controller to sleep, switch on again.

4 Drops connection

Likely cause	How to check	Fix
Drops when a pump or fan starts	Watch the connection while you run the load at 100 % from <i>Controls</i> .	Supply or ground problem. Add or improve the chassis ground for the controller and the load; make sure both GND leads are connected; check the battery feed terminals. Check the load is on the dedicated feed, not the OBD supply.

Likely cause	How to check	Fix
Range	Drops when the phone is in a bag or the controller is in the engine bay behind the firewall.	Move the phone; consider relocating the controller to the cabin.
Controller going to sleep	Drops happen about a minute after the engine is switched off, or on a vehicle whose bus goes quiet while running.	Expected at key-off. If it happens while driving, wire the IGN lead (see sleeps unexpectedly).
Phone power saving	Drops when the phone screen locks for a long time.	Allow FusionDrive background activity; keep CarPlay connected.
Interference from unshielded ignition components	Drops only at high RPM.	Move the controller and its harnesses away from coils and plug leads.

5 OBD not detected / no vehicle data

1 Ignition on, engine running.

Many ECUs answer nothing with the engine off. Give the controller 30 seconds after start-up.

2 Is your vehicle CAN-based?

FusionDrive reads OBD-II over CAN (see [specifications](#)). Vehicles built before CAN became standard receive power from the socket but do not supply data. The controller still works for sensors, outputs and boost; wire the IGN lead so it knows when the engine is running.

3 Check the mode.

In *CAN & OBD* settings, *Auto* listens first and then requests. If the vehicle only answers requests, switch to *Active*. Aftermarket ECUs that broadcast (for example Haltech) need *Passive* plus decode rules.

4 Another device on the socket?

Dongles or splitters on the OBD socket can disrupt the bus. Remove them and try again.

5 Check the plug.

The OBD plug must be fully home. Check the socket for bent or pushed-back pins at positions 6 and 14.

6 Reset CAN.

In *CAN & OBD*, clear the registry and let discovery run again with the engine running.

6 No PIDs, or a value you expect is missing

Symptom	Likely cause	Fix
RPM, coolant, throttle appear, but not boost or AFR	Your ECU does not answer those standard parameters. Very common.	Use the built-in boost sensor for boost; add a wideband with a 0–5 V output on a sensor input for AFR; or decode a documented compatible CAN broadcast. The custom sensor-transmit editor does not add proprietary OBD polling.

Symptom	Likely cause	Fix
Nothing at all after discovery	Engine was off during discovery, or the vehicle only answers active requests.	Run discovery with the engine running; set the mode to <i>Active</i> .
Values update slowly	Many parameters enabled on a slow ECU.	Disable parameters you do not use; the ones you keep update faster.
Values from an aftermarket ECU are wrong	Decode rule uses the wrong byte order, scale or offset.	Check the ECU's CAN documentation; import the DBC file if available; adjust the rule and compare against the ECU's own display.
Fault codes won't read or clear	Engine running, or the ECU does not support clearing over the bus.	Read and clear with the engine off, ignition on.

7 Sensor reads wrong or shows "No signal"

Symptom	Likely cause	Fix
<i>No signal</i>	The signal failed its configured validity/freshness checks. Possible causes include wiring, power/reference, calibration, source selection or stale data; zero volts alone is not a universal fault.	Check the signal wire lands on the input you configured; check 5 V at the sensor between +5V OUT and GND; set validity, calibration and digital thresholds to the actual sensor specification rather than bypassing a fault with a different preset.
Reads full scale all the time	Signal wire touching 12 V or the sensor supply, or the sensor is a 12 V type.	Only 0–5 V sensors are supported. Never connect 12 V to an input; check for chafed wiring.
Reads zero with a healthy sensor	Sensor grounded to the engine rather than Harness C GND, or the range is set wrongly (for example minimum voltage above what the sensor produces).	Ground the sensor to Harness C GND; check the preset's voltage range against the sensor data sheet.
Reading is noisy or jumps	Wiring runs alongside ignition or output wiring; poor ground; sensor supply overloaded.	Re-route away from noise sources, use twisted or shielded wire, check the total load on +5V OUT.
Level switch always on or always off	The switch circuit's bias, threshold or inversion does not match the configured full/empty states.	Measure both switch states and confirm suitable bias and 0–5 V levels. Set threshold, hysteresis, debounce and inversion to the actual circuit; see the wiring example.
Temperature is way off	Two-wire sender configured without the external resistor, or scaled with the wrong points.	Fit the resistor from +5V OUT (see wiring); scale from two known temperatures.
Reading offset by a constant amount	Sensor's true range differs from the preset (for example a 0–100 psi sensor with a 0–150 psi preset).	Edit the sensor and enter the correct minimum and maximum values.

8 Output won't switch

1 Check the app first.

In *Controls*, is the output enabled and in *Manual* mode? An output assigned to the boost controller, water/meth or an automation is controlled by that feature, and a failsafe can hold it off. The output's duty and controlling source are shown on its card.

2 Dedicated 12 V present?

OUT 1–4 need the dedicated feed. If *More* → *Outputs* says it is not connected, check the 30 A fuse at the battery, the BATT+ terminal, and both GND leads. AUX1/2 switch a compatible external supply/load to ground; they do not supply 12 V. On Rev A-LS, verify the dedicated feed electrically because the app indication can be affected by backfeed.

3 Ignition seen?

Check each output/controller's configured ignition-off policy. IGN is a firmware sense input, not a physical OUT interlock. If the app shows ignition off with the key on, the IGN lead is unwired, on an accessory circuit, or on a blown fuse. Measure it: expect battery voltage with the key on.

4 Measure at the lead.

With a suitable test load and 100 % duty, an active OUT1–4 lead should approach its supply voltage relative to power ground. An active AUX1/2 lead instead approaches ground, with voltage across the load from its fused positive supply. Verify supply, return and load current; an unloaded pin reading is not proof of delivery.

5 Check the load's fuse.

A fuse that blows immediately means a short or a load that draws more than expected at start-up. Do not fit a bigger fuse than the output rating.

6 Check the output type.

OUT1–4 supply load positive, with load negative to common ground. AUX1/2 connect load negative to ground when active; load positive goes to a compatible fused supply. Use the LS diagram and test with a suitable dummy load. An unloaded AUX voltage alone does not establish correct switching.

7 PWM and relays.

A mechanical relay driven with a PWM duty below 100 % chatters or does not pull in. Set the output to on/off (100 %) for relays.

9 Output or controller gets hot

Likely cause	How to check	Fix
Load draws more than the output rating	Measure the load's current with a clamp meter at 100 %; check the load's specifications, especially start-up and stall current for pumps and fans.	Stop and validate the load, inrush, PWM, wiring and thermal conditions. OUT1–4 share a 30 A fused path; AUX is nominal 1 A-class. These do not establish safe continuous assembly limits. Use a correctly rated external driver where required.

Likely cause	How to check	Fix
Solenoid, relay or motor without a suppression diode	Inductive loads switched with PWM and no diode across them stress the output every cycle.	Follow the load maker's suppression requirements. For a compatible diode, cathode/stripe goes to load positive: OUT for a high-side circuit, fused +12 V for an AUX low-side circuit. Select current, transient and release-time ratings for the load; see the separate wiring examples .
Controller not heat-sunk	Mounted on plastic, carpet, or hanging from the harness.	Bolt the base plate flat to a metal panel or bracket. The plate is the heatsink.
Poor airflow or hot location	Mounted near exhaust, turbo or radiator, or wrapped in insulation.	Relocate.
Several high loads at once	Total current over 30 A trips the fuse; sustained totals near 30 A run hot.	Spread loads, use relays, or stagger them with automations.
Wrong PWM frequency for the load	A motor run at very low frequency draws high peak currents; a solenoid run at very high frequency may not switch cleanly.	Select the load role, then explicitly set and verify Frequency and Duty Limits against the load maker's requirements before saving.

Warm is normal at sustained high current. Too hot to touch for more than a moment, or a smell, is not: switch the loads off and investigate.

10 Boost reads negative, flat or wrong

Symptom	Likely cause	Fix
Negative at idle	That is vacuum: correct behaviour with the engine idling.	Nothing to fix. Boost goes positive under load.
Negative or nonsense with the engine off	Hose blocked with liquid, or sensor fault.	Disconnect the hose at the controller and let it read open air: expect close to 0 psi. Clear or replace the hose. If it still reads wrong, contact support.
Flat at zero, never moves	Hose off, kinked, split, or tapped before the throttle body; a hose too large for the 2 mm barb that leaks at the joint; or boost source set to OBD MAP with no MAP data.	Check the hose end to end; use 2 mm bore hose at the barb; move the tap to a post-throttle manifold source; in <i>Boost</i> set the source to the built-in sensor.
Reads lower than the ECU or a gauge	Long hose with a small leak, or a restricted T-piece.	Shorten the hose, replace the T-piece, check every joint.
Reads higher than the ECU	ECU shows absolute pressure (MAP) rather than gauge boost, or the tap is before the throttle.	Compare with a gauge, not the ECU's MAP; move the tap.

Symptom	Likely cause	Fix
Spikes or oscillates	Hose picking up pulsation from a single cylinder port, or PID gains too aggressive.	Tap a plenum or common manifold source; lower the response level or gains in <i>Boost</i> .
Over 60 psi shown	Beyond the sensor's range.	The built-in sensor reads to 60 psi. Use an external 0–5 V sensor on an input for higher pressures.

11 Controller sleeps unexpectedly

The controller sleeps about 60 seconds after the vehicle CAN bus has been quiet for 30 seconds *and* the IGN lead is not at 12 V. A connected phone does not keep it awake.

Situation	Why it sleeps	Fix
Non-CAN or aftermarket-ECU vehicle	No bus traffic to keep it awake.	Wire the IGN lead to an ignition-switched circuit.
Vehicle goes quiet on the bus while the engine runs	Some vehicles stop broadcasting when no diagnostic tool is talking.	Wire the IGN lead; or set CAN mode to <i>Active</i> so the controller keeps the bus busy with requests.
IGN lead wired but no effect	Connected to an accessory circuit that is off, or to a circuit that is not 12 V.	Measure the IGN lead: expect battery voltage with the key on. Move it to a proper ignition-switched fuse.
Sleeps during a phone-only session in the garage	Engine off and bus quiet.	Turn the ignition on while you configure, or wire the IGN lead to a switched circuit you can leave on.
Never sleeps, battery goes flat	IGN lead on always-on power, or a vehicle that keeps its bus awake.	Move IGN to an ignition-switched circuit. If the vehicle bus never sleeps, contact support.

More → *Diagnostics* shows the controller's sleep and wake history and the reason for each wake, which tells you exactly which of these is happening.

12 Firmware update fails

1 Wi-Fi details.

The controller needs a 2.4 GHz network and the exact network name and password. 5 GHz-only networks and captive-portal networks (hotel or café logins) do not work. A phone hotspot set to 2.4 GHz is a reliable fallback; on iPhone turn on *Maximise Compatibility*.

2 Signal.

The controller must be within range of the network from where the car is parked. A steel garage door between the car and the router is a common cause. Park closer or use a hotspot placed in the cabin.

3 Keep it awake.

Leave the ignition on for the whole update. If the controller sleeps mid-download, the update is abandoned and retried next time.

4 Read the status.

The update screen shows the stage: connecting, checking, downloading with a percentage, complete. *Wi-Fi is not configured* means the details were not saved; *Connecting...* that never progresses means wrong password or no signal.

5 Interrupted download.

Safe: the controller verifies the whole file before installing it and keeps running the old firmware if verification fails. Simply start the update again.

6 Still failing.

Send a support report (below). Include the network type and where the car was parked.

13 Sending a support report from the app

A support report bundles the controller's own log, a snapshot of its configuration and state, its sleep and wake history, and the app's recent activity. It is the fastest way to get help because it shows us what the controller saw.

1 Reproduce the problem

if you can, with the phone connected to the controller, so the log contains it.

2 Open

More → *Settings* → *Device & firmware* and scroll to *Support & Actions*.

3 Tap

Report an Issue.

4 Describe

what you expected, what happened, and when. Add your email if you want a reply.

5 Submit.

The app collects diagnostics from the controller (a few seconds) and uploads the report. You will see a confirmation.

If the phone cannot connect to the controller at all, you can still send a report: it will contain the app's side of the story, which is often enough to point at the cause. Every report is emailed to hello@fusiondrive.io. You can also write there directly or use the contact form.

14 Configured output missing or not responding

Configured outputs should remain visible even when disabled or following saved rules. If device sync is interrupted, reconnect and wait for a fresh configuration before assuming a save succeeded. For a generic output, live On first enables manual control after device acknowledgement; a rejected setup does not proceed

to the duty command. Use the assigned controller's live actions for controller-owned channels; raw output duty does not bypass its protection or paired fuel logic. If an interrupted-save warning remains, complete recovery and wait for the device to confirm the cleared status.



Questions?

Documentation · fusiondrive.io/docs

Support · in the app: [More](#) → [Settings](#) → [Device & firmware](#) → [Report an Issue](#)

Latest PDFs · fusiondrive.io/docs/#downloads

FusionDrive switches real current to real loads and can control boost, water/methanol injection and nitrous. Fuse every feed and every load, respect the ratings in the specifications, and set failsafes before you drive. Configure and tune with the vehicle stationary. The installer is responsible for compliance with local vehicle regulations. This is a beta-build document; figures marked as design targets will be confirmed for production units.