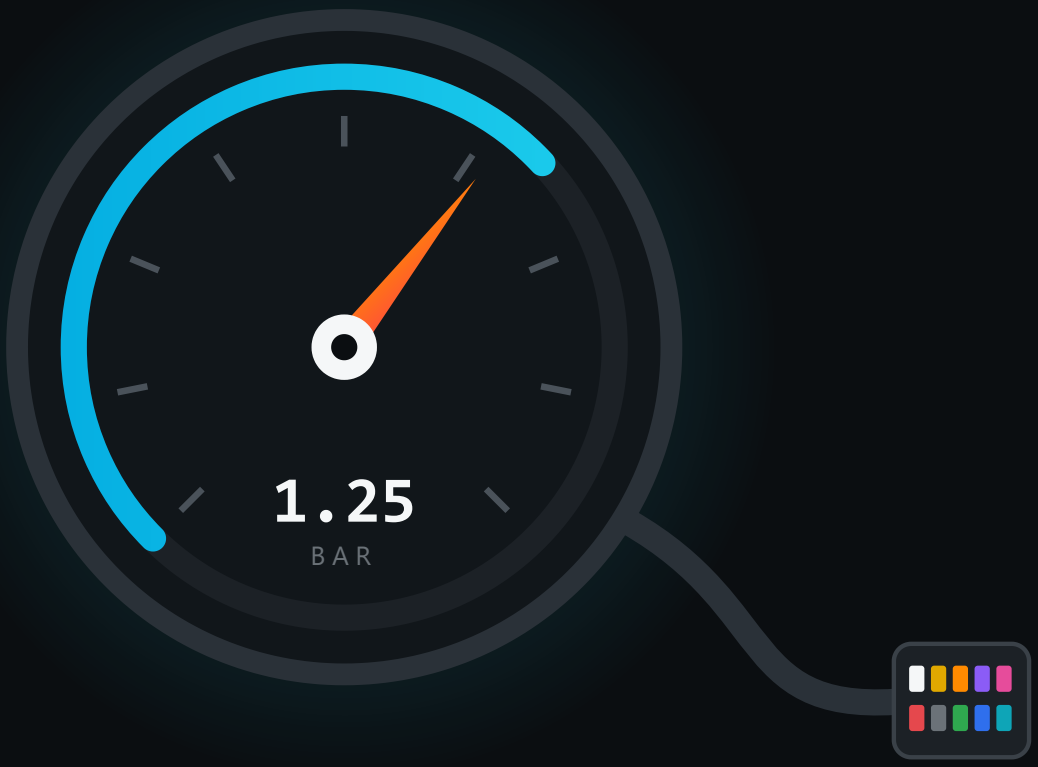
GAUGELAB52



Installation and first-use guide

Connecting the gauge to your car with the OBD cable, wiring 5 V sensors and setting up your first dial with the Gauge Studio app.

PART 1
Installation
10-way connector, OBD cable, 5 V sensors, fitting in the car.

PART 2
First use
Pairing with the app, OBD and 5 V sensors, first dial.

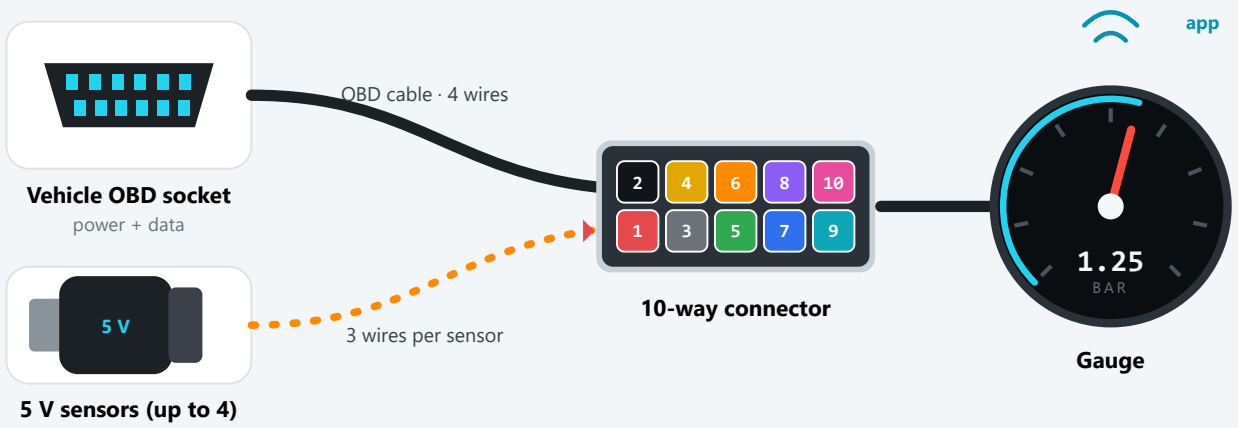
AT THE END
Troubleshooting
What to check if something does not work, technical data.

USER GUIDE · FIRMWARE 0.35 · GAUGE STUDIO APP 0.12 · OCTOBER 2026 EDITION

BEFORE YOU START

How it works, in short

The gauge has a single 10-way connector. Everything goes through it: power and vehicle data (OBD cable) and, if you want, up to four 5 V analog sensors.



Overview: the OBD cable and the 5 V sensors all reach the same 10-way connector.

Two ways to read a value

From the car (OBD). The gauge queries the engine control unit through the diagnostic socket: engine speed, coolant temperature, vehicle speed and every other value your car makes available. No extra sensor is needed.

From a 5 V sensor. For what the control unit does not provide (for example true boost pressure or oil pressure) you connect a three-wire sensor: the gauge powers it at 5 V and measures its signal.

The two sources work together: you can have up to **16 sensors** in total (at most 4 of them 5 V analog), and show them on several dials and screens.

What you need

- GaugeLab52 gauge
- OBD cable with pre-crimped terminals
- 10-way connector (empty housing)
- Smartphone with the **Gauge Studio** app
- For 5 V sensors: 3-wire sensor, crimp terminals for the connector (22–24 AWG), crimping tool, heat-shrink tubing

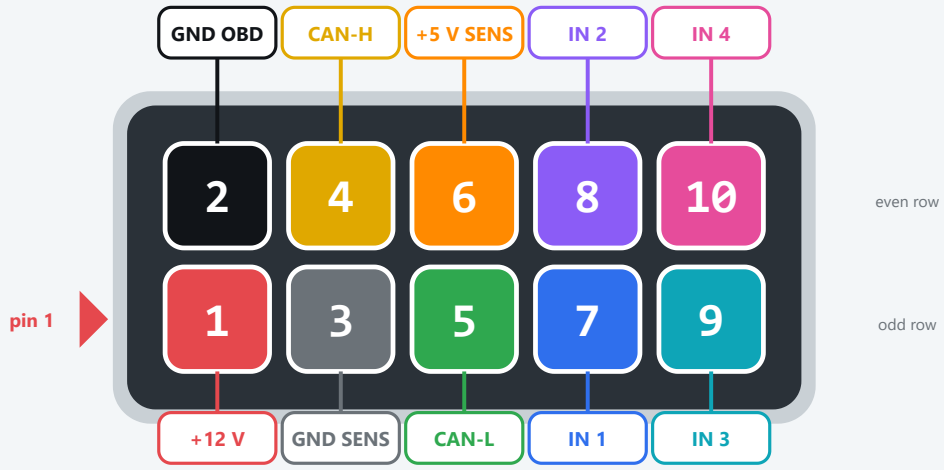
SAFETY

Work with the **engine off and the key removed**. Pin 16 of the OBD socket is always live (12 V), even with the ignition off: plug the cable into the car's socket **only after** you have completed and checked the 10-way connector. Route the cables away from the pedals, the steering column and airbag areas, and secure them with cable ties.

STEP 1

The 10-way connector

Each cavity has a number and a function. Throughout this guide every pin keeps the same colour, so you can spot it at a glance in the diagrams.



Cable connector seen from the **side where the wires go in**. Odd numbers are in one row, even numbers in the other.

HOW TO FIND PIN 1

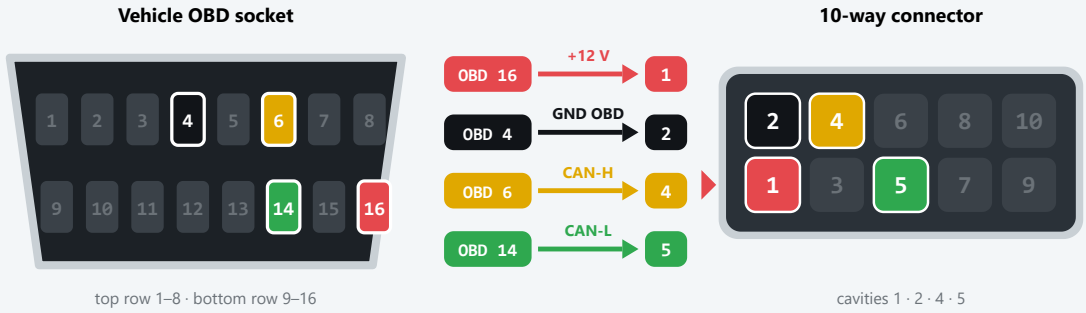
Pin 1 of the cable connector matches **pin 1 of the connector on the gauge**: look for the pin 1 mark (small triangle ▲ or number "1") on the housing and on the board. **Pin 2 is opposite pin 1**, in the other row; pin 3 is next to pin 1, and so on. The connector has a latch and only fits one way round: do not force it.

PIN	NAME	WHAT IT DOES	CONNECTS TO
1	**+12 V**	Power supply for the gauge	OBD socket · pin 16
2	**GND OBD**	OBD cable ground	OBD socket · pin 4 (or 5)
3	**GND SENS**	Common ground for the 5 V sensors	Sensor ground wire
4	**CAN-H**	Vehicle data, high line	OBD socket · pin 6
5	**CAN-L**	Vehicle data, low line	OBD socket · pin 14
6	**+5 V SENS**	Sensor supply (5 V output)	Sensor +5 V wire
7	**IN 1**	0–5 V signal input · Channel 1	Sensor 1 signal
8	**IN 2**	0–5 V signal input · Channel 2	Sensor 2 signal
9	**IN 3**	0–5 V signal input · Channel 3	Sensor 3 signal
10	**IN 4**	0–5 V signal input · Channel 4	Sensor 4 signal

STEP 2

Connecting the OBD cable

Four wires of the OBD cable are used: power, ground and the two CAN data wires. They go into cavities 1, 2, 4 and 5.

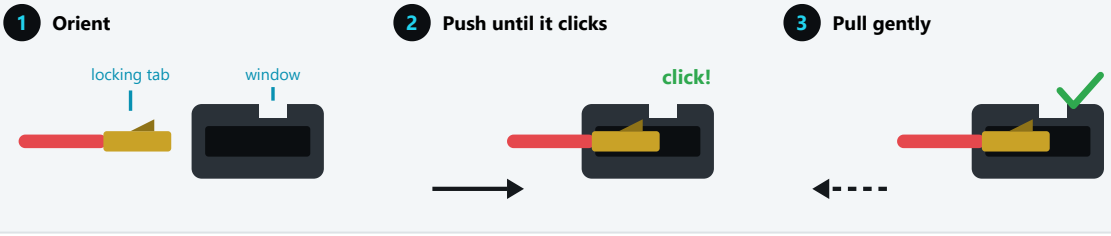


Left: the car's OBD socket seen from the front. Right: the 10-way connector from the wire side.

IDENTIFY WIRES BY NUMBER, NOT BY COLOUR

Wire colours change from one cable to another: the colours in this guide only tell the pins apart in the diagrams. Go by the **OBD pin number** marked on the cable; if the wires are not marked, find each one with a continuity tester between the pin on the OBD plug and the end of the wire. If your cable has two ground wires (OBD pins 4 and 5), fit only one into cavity 2 and insulate the other with heat-shrink tubing.

Fitting the terminals into the connector



1 Orient the terminal
Hold the connector with the wire side towards you. The locking tab of the terminal must face the window of the cavity.

2 Push until it clicks
Insert the terminal into the right cavity and push it straight in until you feel a small “click”.

3 Pull test
Pull the wire gently: it must not come out. Repeat for all four wires, checking the cavity number every time.

4 Wrong cavity?
Gently lift the tab through the window with a needle or an extraction tool and slide the terminal out. Do not pull hard on the wire.

WARNING

The **12 V** wire goes only into cavity **1**. If it ends up in a sensor cavity (6–10) the gauge will be damaged. Check again before plugging the cable into the car.

STEP 3 · OPTIONAL

Connecting 5 V sensors

A three-wire analog sensor receives 5 V from the gauge and returns a voltage that rises with the quantity being measured (usually from 0.5 V to 4.5 V). The gauge reads that voltage and converts it into the value you see on the dial.



One sensor: supply to pin 6, ground to pin 3, signal to one of the inputs (here IN 1, pin 7).

The three sensor wires

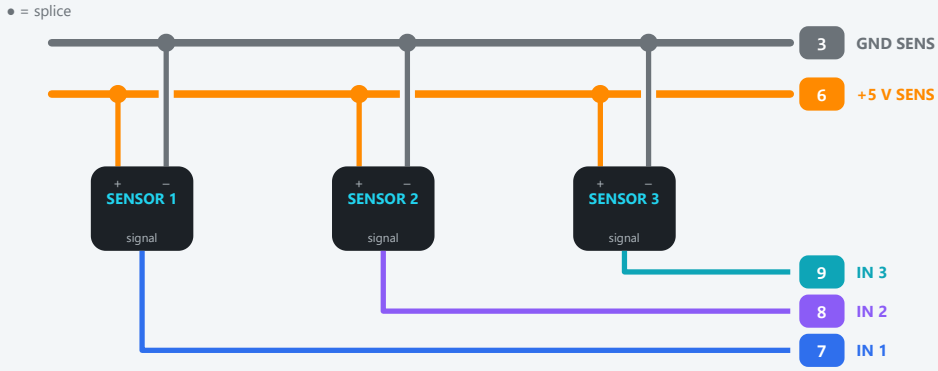
6	**+5 V** · sensor supply
3	**Ground** · sensor return
7 ... 10	**Signal** · one input per sensor

Which wire is which? Check the sensor's datasheet.

Input → channel in the app

PIN	INPUT	IN THE APP
7	IN 1	Channel 1 (AIN0)
8	IN 2	Channel 2 (AIN1)
9	IN 3	Channel 3 (AIN2)
10	IN 4	Channel 4 (AIN3)

Several sensors: shared supply and ground



There is only one pin 6 and one pin 3: the +5 V wires of all sensors join in a splice, and so do the grounds. Each signal has its own input.

LIMITS TO RESPECT

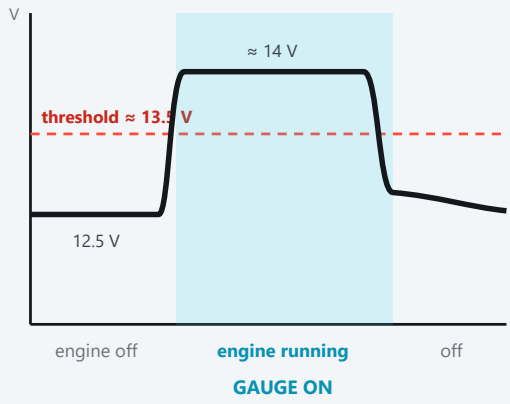
Maximum signal **5 V**: never connect 12 V to pins 6–10. Pin 6 powers sensors only (a few mA each), not other loads. Make the splices **upstream** of the connector and insulate them: **one wire only** (22–24 AWG) goes into each terminal. Two-wire (resistive) sensors cannot be connected directly.

STEP 4

Fitting in the car and first power-on

With the connector complete, hooking up to the car takes a few minutes.

1. **Final check of the connector**
   Compare every wire with the table on page 3. In particular: 12 V in cavity 1, ground in cavity 2.
2. **Plug the connector into the gauge**
   It only fits one way round; press until the latch clicks.
3. **Place the gauge and the cable**
   Choose a clearly visible spot that does not cover the instruments or restrict your view. Run the cable behind the trim and secure it.
4. **Plug the cable into the OBD socket**
   The socket is usually under the dashboard, on the driver's side.
5. **Start the engine**
   The gauge turns on by itself after a few seconds.



The gauge follows the engine, not the key.

Automatic power on and off

The gauge has no switch: it knows the engine is running from the system voltage, which rises above about **13.5 V** when the alternator is charging.

SITUATION	GAUGE	NOTES
Car off, key removed	Off	Negligible current draw: you can leave it plugged in.
Ignition on, engine off	Off	**This is normal.** A resting battery stays below the turn-on threshold.
Engine running	On	It turns on a few seconds after starting.
Engine just switched off	Turns off by itself	After a short delay, adjustable from the app in **Settings**.

WHAT YOU SEE AT FIRST POWER-ON

A new gauge shows a welcome screen with the pairing instructions. **Swipe up** on the display to show the **QR code**: you will need it shortly, in Part 2. On the display you also swipe left and right to change screen.

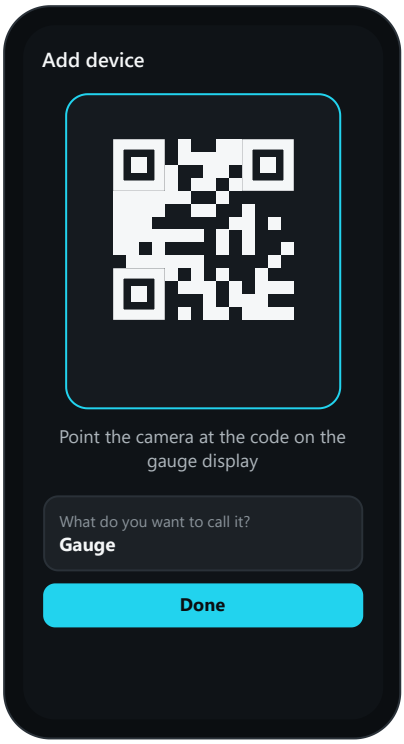
STEP 5

Pairing the gauge with the app

All configuration is done from your smartphone with the **Gauge Studio** app, over Bluetooth. Pairing is done only once.



On the gauge: swipe up to show the QR code.



1. **Install and open Gauge Studio**
   Turn Bluetooth on and grant the permissions requested (Bluetooth and camera).
2. **Start the engine**
   The gauge must be on and showing the welcome screen.
3. **Open "Add device"**
   In the app: `Settings` → `My gauges` → `Add device`.
4. **Scan the QR code**
   The app finds the gauge, connects and pairs it.
5. **Give it a name**
   Choose what to call it and tap `Done`.

The four sections of the app

SECTION	WHAT IT IS FOR
Status	Live reading and quick access to the other sections.
Gauge	The editor: screens, dials, scale, needle, colours. Everything is sent to the gauge from here.
Profiles	Saved configurations, to recall or share.
Sensors	The list of sensors: for each one the value source (OBD or 5 V), calibration and alarm.

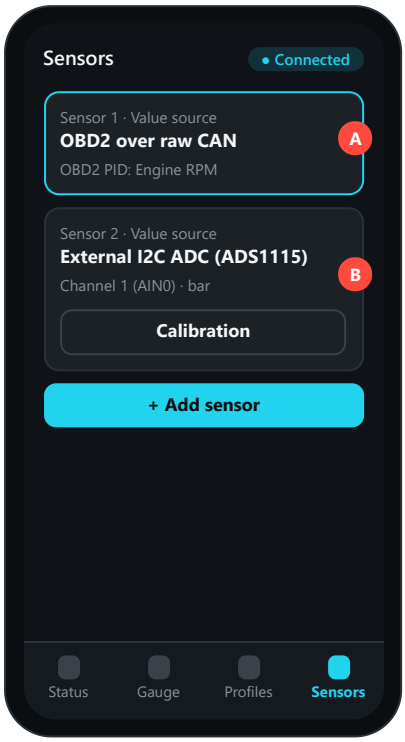
GOOD TO KNOW

After the first pairing the gauge no longer shows the QR code. To connect the next times, tap the connection indicator at the top of the app, or `My gauges`. If you see the dial instead of the code during the first pairing, switch the engine off and start it again.

STEP 6

Setting up the sensors

In the **Sensors** section choose the Value source for each sensor.



A A value from the car (OBD)

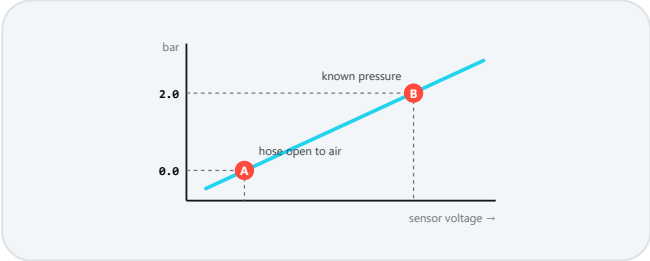
1. In Sensors tap the sensor, then Value source.
2. Choose **"OBD2 over raw CAN (queries the ECU directly, no ELM327 adapter)"**.
3. Tap Detect PIDs supported by the car: the app asks the car which values it makes available.
4. In OBD2 PID choose the value you want (RPM, temperature, speed…).

B A 5 V sensor

1. Tap Add sensor (or an existing sensor) and then Value source.
2. Choose **"External I2C ADC (ADS1115, 4 channels)"**.
3. In ADS1115 channel select the channel of the pin your signal is wired to: pin 7 = Channel 1, pin 8 = Channel 2, pin 9 = Channel 3, pin 10 = Channel 4.

Calibrating a 5 V sensor: two real points

Open Calibration from the sensor, **with the engine running** (the gauge must be on), and show the gauge **two conditions whose true value you know**: it works out the whole scale from those two points.



1. **Point A**
   Bring the sensor to a known low value and enter it. For a pressure sensor: hose still disconnected, open to air = **0 bar**.
2. **Point B**
   Bring the sensor to a second known value, as far as possible from the first (e.g. 2.0 bar from a compressor with a pressure gauge) and enter it.

LIVE VOLTAGE

The Live voltage shown in the app is about **two thirds** of the real sensor voltage (1.0 V at the sensor → about 0.67 V): this is normal. Use the same scale for A and B (both relative to atmosphere, or both absolute).

STEP 7

Your first dial

Now that the sensors are in place, build the screen. The quickest way: start from a preset gauge and adapt it.



1. **Open "Gauge" and select the dial**
   In **Arrange** mode you see the whole screen: tap the dial, then switch to **Edit**.

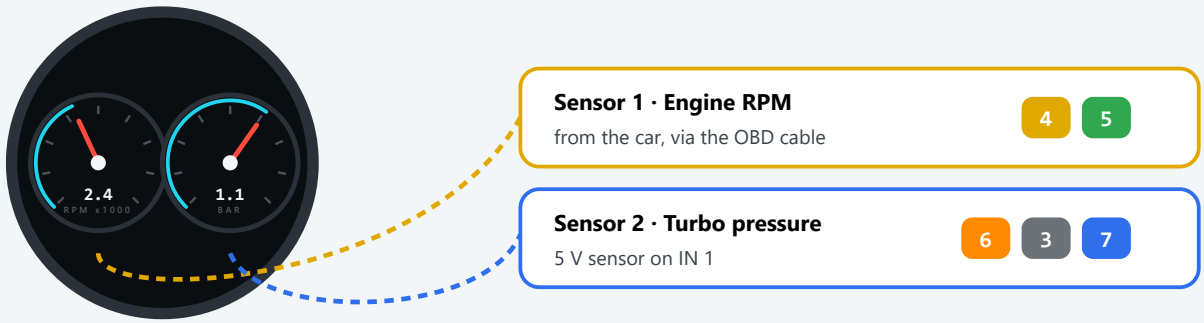
2. **Choose the sensor and the scale**
   Link the dial to one of the sensors you set up. **Sensor preset** sets unit, minimum, maximum and ticks in one go: "Turbo pressure", "Engine temperature", "Oil (pressure)", "Engine RPM", "Speed"…

3. **Choose the look**
   In **Preset gauges** you find ready-made styles. Then, if you like, change needle, ticks, colours and zones in the editor sections: the preview updates straight away.

4. **Send to the gauge**
   Tap the arrow icon at the top (**Send to gauge**): the dial appears on the display within a few seconds.

5. **Save the profile**
   In the **Profiles** section save the configuration: you can recall it or start again from there.

Complete example: engine RPM + turbo pressure



One screen, two dials, two different sources.

SENSOR	VALUE SOURCE	SETTING	SENSOR PRESET
Sensor 1	OBD2 over raw CAN	PID: engine RPM	Engine RPM
Sensor 2	External I2C ADC (ADS1115)	Channel 1 (pin 7) + A/B calibration	Turbo pressure (with vacuum)

To place two dials side by side: in **Arrange** add a second dial, drag and resize it; then select it and repeat steps 2–4. A screen can hold up to 4 dials and the gauge up to 6 screens, which you swipe through on the display.

IF SOMETHING GOES WRONG

Troubleshooting

WHAT HAPPENS	WHAT TO CHECK
The display stays off with the ignition on	This is normal with the engine off: start the engine.
The display stays off with the engine running	Check cavities 1 (12 V) and 2 (ground) and that the connector is fully seated. Check the car's fuse for the OBD socket / cigarette lighter.
The OBD sensor gives no values	Check that CAN-H and CAN-L are not swapped (cavities 4 and 5). Use `Detect PIDs supported by the car` : not every car exposes every value. Cars with OBD2 diagnostics over CAN are supported.
The 5 V sensor shows a fixed or meaningless value	Check that the channel chosen in the app matches the pin (page 5), that the sensor ground reaches pin 3 and the 5 V reaches pin 6. Repeat the calibration.
The value does not change after calibration	Turn the gauge off and on again (switch the engine off and restart it).
The app cannot find the gauge	Bluetooth on, permissions granted, phone nearby and gauge on (engine running). The first pairing needs the QR code on the display.
I changed phone	Hold a finger still on the display for 10 seconds and confirm the reset: the gauge shows the QR code again.

Wiring summary



wire side · ▶ = pin 1

1	**+12 V**	OBD pin 16	6	**+5 V SENS**	Sensor +5 V wire
2	**GND OBD**	OBD pin 4 (or 5)	7	**IN 1**	Sensor 1 signal
3	**GND SENS**	Sensor ground wire	8	**IN 2**	Sensor 2 signal
4	**CAN-H**	OBD pin 6	9	**IN 3**	Sensor 3 signal
5	**CAN-L**	OBD pin 14	10	**IN 4**	Sensor 4 signal

Technical data

Power supply	**12 V** from the OBD socket (pin 16)	Analog inputs	**4**, 0 to 5 V
Protection	Fuse, reverse polarity, overvoltage	Sensor output	5 V, fuse protected
Vehicle data network	CAN (OBD pins 6 and 14)	Configurable sensors	16 in total (4 analog 5 V)
Display	Round touch, 412 × 412 pixels	Screens / dials	6 screens, 4 dials each

NOTICE

Installation on a vehicle is the responsibility of whoever carries it out. Do not look at or configure the gauge while driving: set everything up with the vehicle stationary.