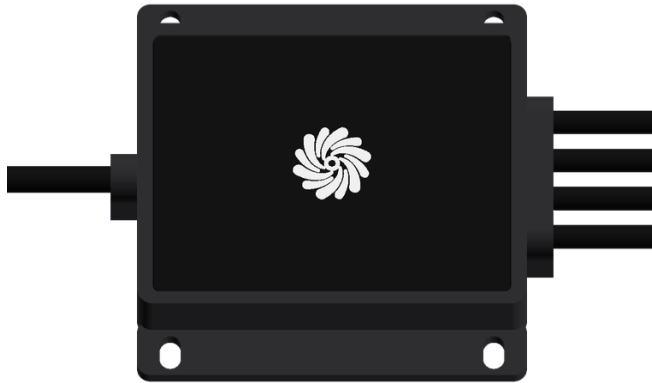


Four engine sensors on the CAN bus. Each input takes a **0 – 5 V sensor, a thermistor or a switch**, chosen from a phone, and the module sends the reading in its unit: pressure, temperature, air-fuel ratio, voltage or a switch state. It is sealed, wires in with **five cable pigtails**, and is set up from its own WiFi page with no app and no laptop.



CANA-4

Specifications

4 ANALOG INPUTS · CAN OUT

Parameter	CANA-4
INPUTS	
Inputs	4, each set to 0 – 5 V, thermistor or switch from the setup page
0 – 5 V mode	0 – 5 V, 20 kΩ input, 16-bit conversion, 0.25 mV per count
Thermistor mode	10 kΩ 0.1% pull-up to the module's own 5 V, switched in per input. Curves for the Bosch NTC M12 family, GM/Delphi coolant and air temperature sensors, a generic 10 kΩ NTC, or a three-point custom curve
Switch mode	Open or closed, to ground
Presets	Raw volts · generic 0.5 – 4.5 V sender · GM 2-bar and 3-bar MAP · AEM UEGO · Innovate LC-2 · Bosch NTC M12 · GM/Delphi temperature · 10 kΩ NTC · switch · custom scale · custom curve
Calibration	One or two points per input, entered as what the sensor should read
Smoothing	Per input, 0.1 to 5 s, off by default
Failed input	Sends a very high value, a very low value, or holds the last good one, chosen per input; the status frame says why
Refresh	Up to 200 Hz per frame, set on the page. The bus load the module may take is capped at 30 %
Accuracy	Design values: 0.1% resistors, 16-bit conversion, the 5 V reference measured by the module itself. <i>No measured system accuracy over temperature yet</i>
SENSOR SUPPLY	
Output	5 V, 100 mA in all, on each sensor cable's red conductor
Protection	Survives a short to ground and a short to battery, and recovers when the fault clears
CAN	
Bus	CAN 2.0B, 50 kbit/s to 1 Mbit/s, 11-bit or 29-bit identifiers. 500 kbit/s by default

Parameter	CANA-4
Frames	Up to four, each with its own identifier and rate. By default a data frame of four signed 16-bit readings at 0x6E0, 20 Hz, and a status frame at 0x6E1, 5 Hz. Every value's position, width, sign, byte order and scale is a setting
Byte order	MS byte first by default, LS first selectable, per value
Termination	120 Ω on board, switched from the setup page, off until first-run setup asks
Bus safety	Silent at power-on, listens before transmitting, backs off if nothing acknowledges it, never transmits at a bit rate the bus is not running
SETUP	
Interface	The module's own WiFi setup page, from any phone or laptop browser. No app, no cable
Window	The WiFi is up for 5 minutes after power-on, stays up while a phone is connected, and can be closed from the page
Security	Each unit has its own WPA2 password, printed on its label
Updates	Firmware updates from the setup page. A new image that does not reach a healthy bus is undone automatically
SUPPLY	
Voltage	8 – 16 V switched, 12 V nominal. Starts above about 7 V; resets below about 6 V, as during a cold crank, and is back on the bus a few seconds after the engine catches
Current	About 50 mA, and up to 150 mA with the setup page open. <i>Design values, not yet measured</i>
Reverse polarity	Protected indefinitely
Jump start	24 V for 5 minutes
Load dump	Transient to 40 V
ENVIRONMENT	
Component rating	–40 to +105 °C
Recommended ambient	Under 105 °C. Mount away from the exhaust side
Ingress	Sealed
MECHANICAL	
Enclosure	73.5 × 56 × 18.1 mm, 83.5 mm over the cable collars, ASA
Mounting	Two zip-tie flanges
Power and CAN cable	300 mm, 4-core 22 AWG, black jacket, marked CAN: red 12 V, black ground, white CAN H, green CAN L. Conductors tinned
Sensor cables	Four, 300 mm, 3-core 22 AWG, black jacket, marked 1 to 4 on the cable and on the module: red 5 V, black ground, white signal. Conductors tinned

Wiring

FIVE CABLE PIGTAILS

One black cable for power and CAN at one end, and four black sensor cables at the other, one per input, numbered on the cable and on the module. Splice them into the harness with the supplied butt splices, or fit the connector your ECU's cable wants. There is no connector on the module because every ECU brand wires its CAN plug differently.

Power and CAN cable · black, marked CAN

Conductor	Goes to
● Red	Switched, fused 12 V. Not the ECU's 5 V sensor supply
● Black	Ground. The ECU's ground, or the chassis ground the ECU uses
○ White	CAN H
● Green	CAN L

Sensor cables 1 to 4 · black, one per input

Conductor	Goes to
● Red	5 V to the sensor, 100 mA for all four together
● Black	Sensor ground
○ White	The sensor's signal: input 1 to 4, by the cable's number

A **0 – 5 V sensor** — a pressure sender, a wideband's analog output, an EGT amplifier — takes its cable's three conductors: red to its supply, black to its ground, white to its signal. If the sensor has its own supply, an EGA12 on switched 12 V for instance, join only black and white.

A **thermistor** — coolant, oil, air or fuel temperature — takes two: white to one terminal, black to the other. Choose the sensor on the setup page and the module switches its pull-up in. Ground it at the cable's black conductor, not the block: every 5 mV of ground offset reads as a fraction of a degree.

A **switch** takes white; the switch closes to ground, or to the cable's black.

A **pre-converted EGT** reaches the module as a 0 – 5 V signal from a separate amplifier. Choose **custom scale** for the input and enter the amplifier's two points from its datasheet: 0 V = 0 °C and its full-scale point.

- **Carry CAN H and CAN L on as a twisted pair** from the cable to the bus, one turn every couple of centimetres. Two parallel wires are not a CAN bus.
- **Use a fused feed.** The module draws under a quarter of an amp; a 3 A fuse protects the wire.
- **Decide where the module sits on the bus** before setup. At the far end of a bus, or alone with the ECU on a bus of its own, it is a bus end and its termination goes on. Spliced into the middle of a bus that already has a terminator at each end, its termination stays off. First-run setup asks this question, and a wrong answer shows up as errors once the car is hot.

Setup

FROM A PHONE, NO APP

1. **Power the module** with the ECU. Its WiFi network, CANA-4- followed by four characters, is up for 5 minutes.
2. **Join it** from a phone, with the password on the module's label. The setup page opens by itself the first time. On a later visit, if it does not open, open the phone's WiFi settings, or go to 192.168.4.1 in a browser.
3. **Answer the termination question:** is this module one end of its bus? Setup does not finish until it is answered.
4. **CAN tab:** pick the bit rate, identifiers and byte order your ECU expects. The module tries a changed setting first and keeps it only once the bus acknowledges it; a change that never reaches a healthy bus is undone after 30 seconds.
5. **Inputs tab:** choose each input's sensor. That sets its mode and the unit it sends. Calibrate if the reading is off: hold the sensor at a value you know and type what it should read. Set smoothing and the failed-input value if the defaults do not suit.
6. **Bus tab** shows what the bus is doing, the counters, and what to check if the module has stopped transmitting.
7. **Unit tab:** firmware updates, a settings backup, display units, and the measured 5 V reference.

Then set up the ECU to read the two frames: the setup guides.

CAN output

TWO FRAMES BY DEFAULT

Two 8-byte frames, set up for a Link ECU by default. Everything about them is a setting: the bit rate, each frame's identifier, length and rate, and each value's position, width, sign, byte order, scale and offset, so any ECU or dash that reads a user-defined CAN frame can be given the bytes it wants. The CAN tab shows the layout and gives it as a text file and as a DBC file. These are the defaults.

Default frames

Frame	Identifier	Rate	Bytes 0 – 1	2 – 3	4 – 5	6 – 7
Data	0x6E0	20 Hz	Input 1	Input 2	Input 3	Input 4
Status	0x6E1	5 Hz	Input 1 and 2 states	Input 3 and 4 states	Flags, counter	Firmware version

Each reading is a signed 16-bit value in the unit its sensor sets, MS byte first:

Units on the bus

Quantity	One count is	Reads up to
Pressure	0.1 kPa	±3,276.7 kPa (±475 psi)
Temperature	0.1 °C	±3,276.7 °C
Voltage	1 mV	±32.767 V
Air-fuel ratio	0.01	±327.67
Lambda	0.001	±32.767
Percent	0.1 %	±3,276.7 %
Switch	1	0 open, 1 closed

The bus stays metric; convert for display at the ECU or dash. A failed input sends 0x7FFF, 0x8000 or its last good reading, as set on the page, and its state byte says why: 1 below the sensor's range, 2 above it, 3 the wire is driven by something else while set to thermistor or switch, 4 not configured, 5 the converter did not answer. The status frame's counter steps by one each frame, so a receiver can tell a live module from a frozen value.

Three fitting rules

READ BEFORE FITTING

1. Terminate once, at the ends.

A CAN bus has one 120 Ω at each physical end and none in between. With everything off, a meter across CAN H and CAN L should read about 60 Ω: two terminators. About 120 Ω is one, about 40 Ω is three. The module's own terminator only exists while it is powered, so a meter reads the others.

2. Feed it switched 12 V that stays on while cranking, through a fuse.

The module resets below about 6 V and comes back on the bus a few seconds after the engine catches; a supply that drops with the starter every time is a nuisance, not a fault.

3. Sensor ground is the black sensor lead, not the block.

A thermistor or a 0 – 5 V sender referenced to the engine reads every millivolt of ground offset as signal. Keep sensor leads short, and away from ignition leads.

For the WiFi setup page, mount the module with its long side away from sheet steel where you can: a firewall between the module and the phone costs more range than anything else.

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In the box

MODULE

The module, its splices and its card.

- **The module**, its five cables marked and their conductors tinned
- **Sixteen butt splices**, 22 AWG
- **A card** with the unit's WiFi name and password, and a link to the setup guides

Warranty

12 MONTHS

12 months, replace, no questions asked.

The module is sealed against vibration, moisture and heat cycling.

Support: sales@rosinalabs.com. Include the ECU it is fitted to, and what the Bus tab shows.

Full terms: rosinalabs.com/policies