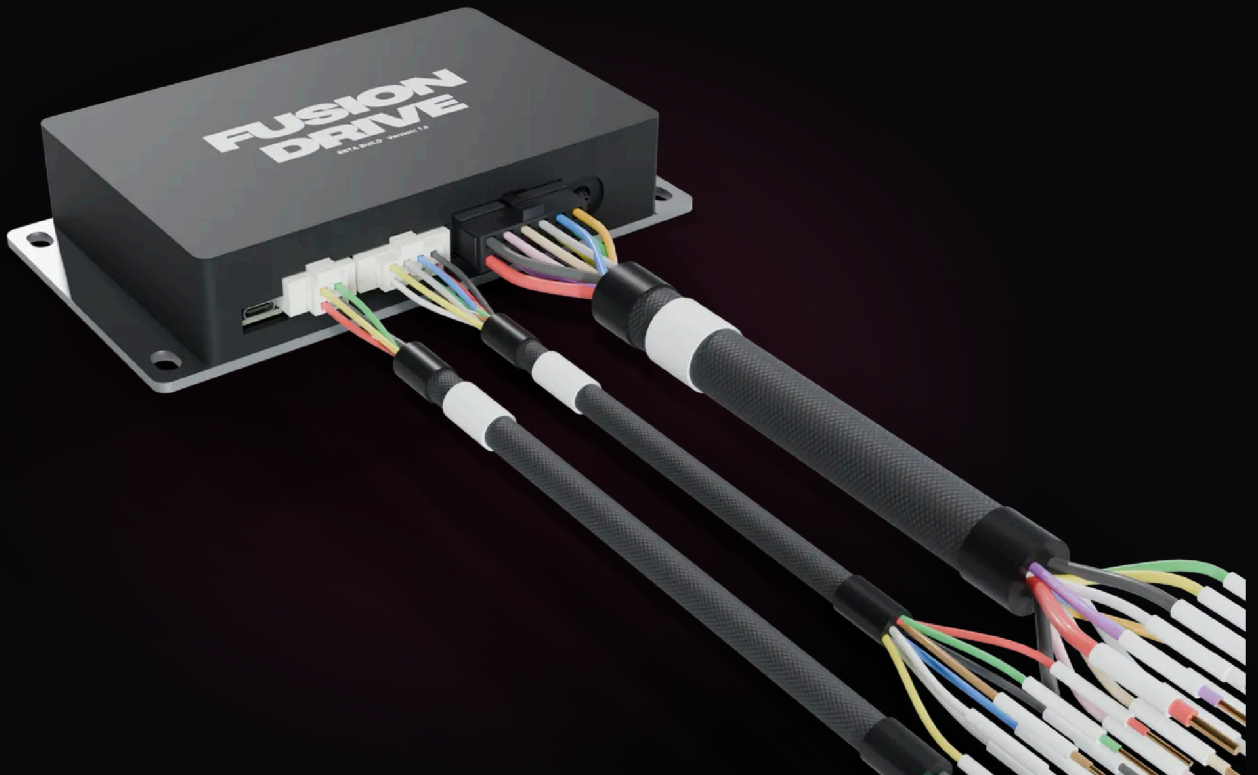




— EXACT-MODEL INSTALLATION GUIDE

AEM 30-2200 Ethanol + fuel temperature

Connect this exact accessory to FusionDrive. Wiring diagrams, app setup, logging and a clear assessment of what can be retained or replaced.



Contents

1	Identify the exact flex-fuel kit	2
2	Wiring diagrams	3
	W1 · AEM 30-2200 through a qualified frequency/pulse-width decoder	
3	Route A · retain the existing ECU or ethanol display	6
	Exact native wire schedule · Before terminating wires	
4	Route B · replace the display/receiver with a decoder and FD	7
5	FD configuration for the selected decoder	8
6	Automations and a useful tuner recording	9
7	Commissioning and failure-state acceptance	10
8	Sources and review scope	11

1

— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Identify the exact flex-fuel kit

This guide covers **AEM 30-2200**, the barbed-fitting kit with 35-2200 sensor and 3/8 inch fittings. The 30-2201 kit uses -6 AN adapters and is a different plumbing package. The electrical sheet is shared; identify the actual sensor and connector before assembly. Fuel installation remains subject to suitable hose, fittings and pressure/flow design.



Identification image: the barbed 30-2200 sensor illustration extracted from the official AEM10-220X manual p1. The 30-2201 AN-fitting illustration is not substituted.

This is a researched FD Design LS installation design for local review; physical compatibility has not been bench/vehicle verified. Match the exact model, manual revision and connector orientation before assembly. The drawings show electrical nets, not universal mating-face views.

FD adds shared visibility, local rules and phone logging. It does not alter the stock ECU tune through a logging connection. The ESP stores device settings; phone and portal are views/configurators. Phone recordings and optional cloud backup are separate.

The sensor encodes **two measurements on one pulse signal**: frequency represents ethanol percentage, and the low pulse duration represents fuel temperature. It does not contain separate analogue wires or a CAN transceiver. FD's six analogue inputs cannot directly decode that waveform. A wire from the sensor to an IN is therefore not the supported route.

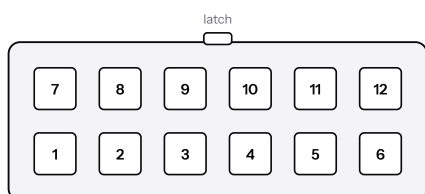
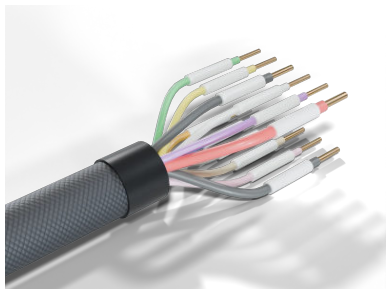
2

— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Wiring diagrams

Start here for the actual wire connections. First locate the FD leads, then choose the drawing for the route you are installing.

Harness B • J6 • 12-way

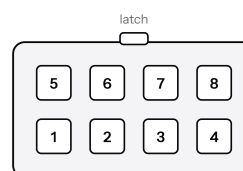
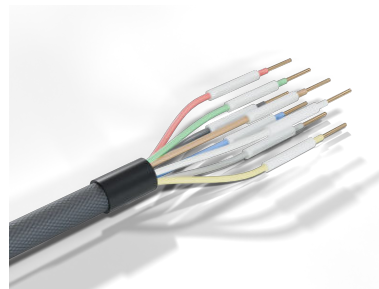


Bottom row, left to right: 1 BATT+ · 2 AUX1 · 3 IGN · 4 GND · 5 CAN2 H · 6 CAN2 L
Top row, left to right: 7 GND · 8 AUX2 · 9 OUT4 · 10 OUT3 · 11 OUT2 · 12 OUT1

Looking into the plug's mating face with the latch at the top

Original FusionDrive harness reference. Look into the plug mating face with the latch at the top. Wire drawings show logical terminal positions.

Harness C • J8 • 8-way



Bottom row, left to right: 1 IN1 · 2 IN2 · 3 IN3 · 4 +5V OUT
Top row, left to right: 5 IN4 · 6 IN5 · 7 IN6 · 8 GND

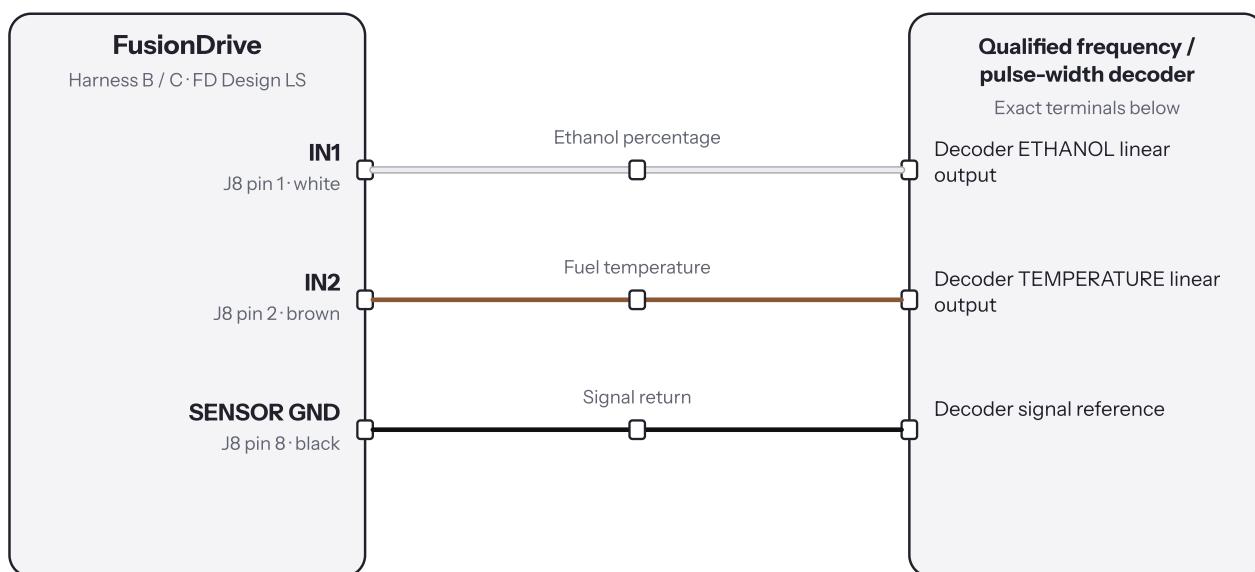
Looking into the plug's mating face with the latch at the top

Original FusionDrive harness reference. Look into the plug mating face with the latch at the top. Wire drawings show logical terminal positions.

Wire colours match the FD flying leads; the accessory segment uses its documented colour where known. A small sleeve marks an insulated splice. Match the lead label and cavity number. Harness B AUX1/AUX2 are low-side ground sinks. OUT1-4 supply positive voltage from the dedicated feed. Harness C inputs accept conditioned 0-5 V signals. Never join competing supplies or output drivers.

1. W1 • AEM 30-2200 through a qualified frequency/pulse-width decoder

2.1

W1 • AEM 30-2200 through a qualified frequency/pulse-width decoder

Wire colours: FD loom at left; documented accessory wire at right. Small sleeve = insulated splice.

Connector positions here are logical; use the mating-face drawings to locate FD cavities.

AEM 30-2200 through a qualified frequency/pulse-width decoder

Terminal-to-terminal wiring schedule

From	To	Signal / electrical condition
Decoder ETHANOL linear output	FD IN1 / J8 pin 1	Ethanol percentage bounded 0–5 V
Decoder TEMPERATURE linear output	FD IN2 / J8 pin 2	Fuel temperature bounded 0–5 V
Decoder signal reference	FD sensor ground / J8 pin 8	Signal return ground

OFF / released: Missing/invalid pulses must produce a diagnosable fault; no ethanol permission

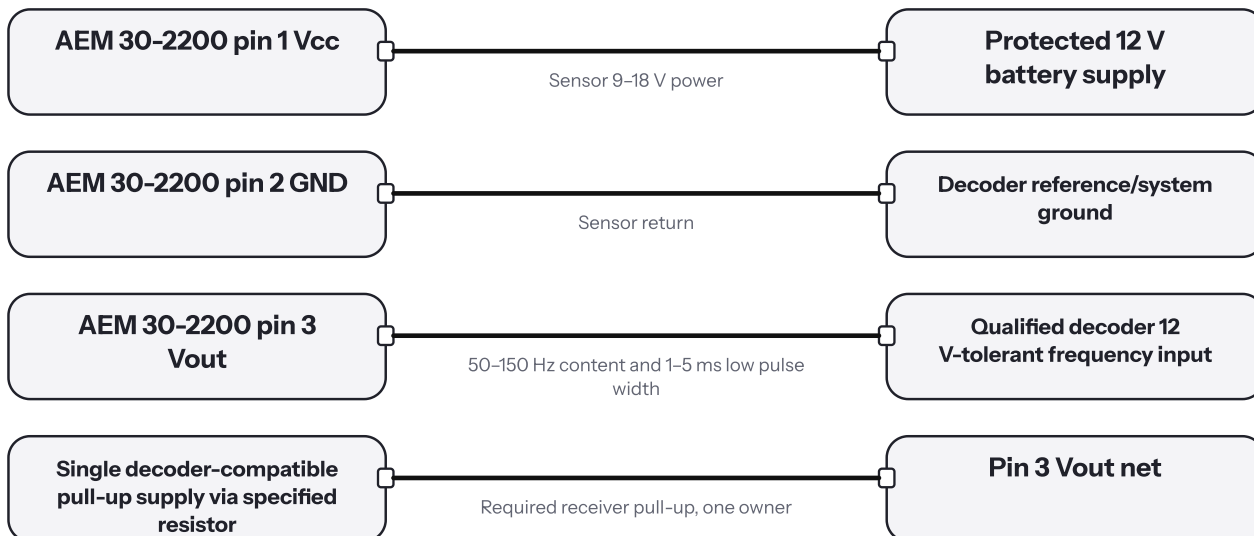
ON / active: Decoder supplies two independently calibrated analogue measurements to FD

Qualification: Exact decoder, pull-up voltage/resistance, pulse thresholds and invalid outputs must be qualified. No direct pin 3-to-FD-IN wire.

Accessory-side connections - 1

AEM 30-2200 Ethanol + fuel temperature · accessory-side connections

Accessory connections for the selected route. Grey bands are complete looms; blue dashes are pressure hoses.



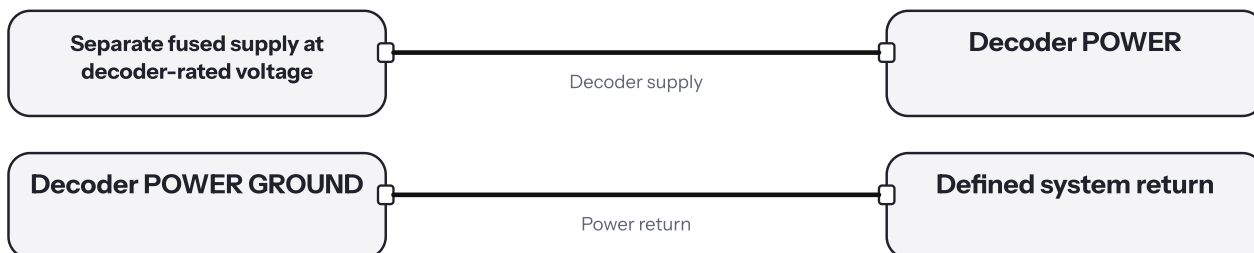
Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

Complete the accessory-side circuit for the selected route. Retain or transfer connections as specified in the installation steps; do not join competing supplies or output drivers.

Accessory-side connections - 2

AEM 30-2200 Ethanol + fuel temperature · accessory-side connections

Accessory connections for the selected route. Grey bands are complete looms; blue dashes are pressure hoses.



Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

Complete the accessory-side circuit for the selected route. Retain or transfer connections as specified in the installation steps; do not join competing supplies or output drivers.

3

— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Route A - retain the existing ECU or ethanol display

Keep the sensor's power, ground, signal receiver and pull-up exactly as commissioned. If the ECU uses ethanol content for fuelling/ignition, it must retain that valid input and its own fallback strategy. FD may receive a separately documented linear output or CAN broadcast from the existing receiver. Obtain that receiver's exact message definition and validity behaviour before configuring it; this AEM sensor manual cannot supply a universal ECU PID or CAN ID.

3.1 Exact native wire schedule

Sensor terminal	Documented function	Installation consequence
Pin 1 Vcc	Battery supply; 9–18 V operating range	Protected 12 V circuit; not FD sensor 5 V
Pin 2 GND	Battery/reference ground	Retain the receiver's defined reference
Pin 3 Vout	Frequency and low-pulse-width output	Requires a12 V-tolerant digital/frequency receiver
Receiver pull-up	Required unless present internally	One designed pull-up; no arbitrary parallel resistor

AEM describes a2.2–10 kOhm output pull-up range, with no external resistor needed for its named compatible ECUs. Do not copy an ECU-specific internal pull-up assumption to a different decoder. Confirm voltage levels, sink loading and the receiver's actual thresholds. Pin numbering follows the manufacturer's sensor connector drawing; check the key and mating-view orientation.

3.2 Before terminating wires

- 1 Record model, sender, connector orientation, settings and existing receivers. Save a baseline log, verify native warnings and isolate power/loads.
- 2 Reserve the illustrated inputs. J8-8 is sensor ground; J8-4 is 5 V and stays unused unless specified. Never parallel active supplies.
- 3 Preserve power returns. Keep motor/heater current out of sensor ground; insulate, strain-relieve and separate wires from heat/ignition.
- 4 Check unpowered continuity. Meter operating and fault voltages against FD sensor ground before attaching IN.

AEM specifies this sensor in the return line between regulator and tank. For a very high-flow system it permits a suitable parallel return sampling path rather than forcing all return flow through the sensor. Its published maximum flow is 400 L/h; treat that as a component specification, not proof that a particular fuel system is unrestricted. Verify leaks and pressure behaviour after installation. Sample transport delay matters after refuelling or when little return fuel is moving.

4

— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Route B - replace the display/receiver with a decoder and FD

If the original ECU still needs the pulse measurement, do not remove its receiver ownership. For an independent display replacement, select a decoder that accepts this exact electrical pulse interface and decodes both frequency and low-pulse duration, with documented missing-pulse handling. A frequency-only converter cannot also provide fuel temperature. No specific decoder is certified here; the following functional-terminal harness is conditional until its part and data sheet are added to the installation record.

Use wiring diagram W1 in the Wiring diagrams chapter for the exact connections. Return here for the installation and app setup steps.

- 1 Disconnect the removed receiver and its pull-up before installing a new sole-owner decoder. If sharing is necessary, separately qualify the loading and fault interaction; two active excitation arrangements are not assumed compatible.
- 2 Retain the sensor's protected 12 V supply and ground. Connect pin 3 only to the decoder's documented frequency input, with the one correct pull-up.
- 3 Supply the decoder from its rated protected circuit and connect its two bounded analogue outputs to FD IN1 and IN2. Connect the decoder signal reference to J8 pin 8. Neither sensor nor an unspecified decoder should be powered from J8 pin 4 by default.
- 4 Confirm ethanol% = frequency Hz-50:50 Hz=0%, 100 Hz=50%, 150 Hz=100%. Confirm temperature°C = $41.25 \times \text{low-pulse-width} - 81.25$: 1 ms=-40°C, 3 ms=42.5°C, 5 ms=125°C. These are bench stimulus checks, not expected values for a particular fuel sample.
- 5 Require missing pulses, out-of-range frequency and decoder reboot to yield a defined fault. A held last value is not acceptable as a fresh healthy ethanol reading.
- 6 Preserve required independent fuel/tune protections. Removing a display does not make FD the ECU's flex-fuel tuner or calibrate its injection map.

5

— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

FD configuration for the selected decoder

Current app workflow: Configure this installation from its function in Settings. Controls provides live actions and the Dashboard provides glance controls; use a card's edit menu to return to setup. A configured output remains visible even when disabled. Enabled rules operate their assigned enabled outputs automatically; there is no extra output mode to select. Live Off, On or duty takes over a generic output until you choose Resume automation. Setup keeps the electrical limits, calibration and response settings. Assigned boost, WMI and nitrous outputs use their controller-specific actions, preserving sensor protections and any paired fuel/stage logic. Nitrous Arm allows its configured activation conditions to operate; it is not an unconditional spray command.

Setup and vehicle data: Starting presets remain editable; Add Sensor includes calibration and fine tuning before Create. Use dedicated IGN, fresh running-engine OBD evidence, or both for vehicle activity; a dedicated IGN wire is optional when valid OBD evidence is available. If the pressure hose is unused, explicitly select OBD pressure in setup. A valid atmospheric sensor reading cannot identify a disconnected hose. These app choices do not change the product-specific electrical compatibility or limitations described below.

The worked assignment is **IN1 ethanol** and **IN2 fuel temperature**. It assumes the selected decoder is deliberately configured for 0.5–4.5 V=0–100% and 0.5–4.5 V=–40–125°C. These are proposed decoder maps, not native AEM outputs. Use the actual converter's values if it cannot implement them.

In **Sensors**, tap each named empty input card, choose **0–5 V Generic**, Type **Analog**, give each a unique name and Create. Edit IN1 to Unit %, Additional voltage scale **1**, Voltage Range **0.5–4.5**, Value Range **0–100**. Edit IN2 to Unit **°C**, scale **1**, Voltage Range **0.5–4.5**, Value Range **–40–125**. Configure Display Range and Show on Dashboard independently. Save each, wait for ESP acknowledgement and reopen to confirm. The plus button uses the first free input rather than a pin selector.

Compare Connector voltage, Current Value and Acquisition age against the pulse generator and decoder display at the points above. Reboot FD, read settings back and test with the phone absent. If using an existing receiver's CAN output instead, configure its documented bus speed, standard/extended ID, byte/bit layout, signedness, multiplier and offset in CAN signals; do not use an AEMnet gauge ID for this non-CAN sensor.



— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Automations and a useful tuner recording

A useful review overlay shows ethanol content and fuel temperature alongside lambda and load after refuelling. Treat an apparent composition change as a measured event to verify; FD reading ethanol does not retune the stock ECU. An ethanol-dependent permission must release on missing/invalid decoder data, not merely on a low numeric value.

Start with a disabled rule called **Ethanol content - AEM 30-2200 decoded - review threshold** and an isolated indicator or dummy load. Use **ALL conditions (AND)**: the named measurement crosses an installer-approved test threshold, its **Valid** field is ON, and its **Acquisition age** is within a tested limit. For an analogue channel, also qualify **Connector voltage** against the accepted source range. These fields appear under the sensor's configured name. CAN freshness and physical validity are different: repeated frames can contain a failed sensor value.

Use a qualified indicator/interface: AUX1 / J6 pin 2 and AUX2/J6 pin 8 sink current; they do not supply 12 V. For a binary AUX test, start at 0, request 100% when true, and enable **Restore Previous Value When False** only with prior value 0 and one output owner. Do not omit required gates to fit rule limits. Independently test source-loss release and latency.

In **Data Log** settings select **Ethanol content - AEM 30-2200 decoded**, raw voltage and age where exposed, then add fuel temperature, lambda, RPM, fuel pressure and boost/nitrous requests, relevant controller request/state and automation transitions. Choose active/idle rates and inspect achieved timestamps after leaving the live screen. A source's published update rate is not a promise of that phone recording rate; a 50 Hz request cannot produce new measurements from a 20 Hz source.

Label commands as requests. Record sender location, model, units, calibration and wiring revision. Overlay modification and vehicle traces to investigate events; Cloud/Intelligence can suggest trends, not prove flow or guarantee engine safety from a command.



— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Commissioning and failure-state acceptance

Use isolated loads and an independent reference first. These are required checks, not recorded test results.

Test	Required observation
FD disconnected	Original display, controller and warnings remain correct
Low/middle/high reference stimulus	Calibration matches within agreed tolerance
Source power absent	Missing data does not grant a healthy permission
Signal and reference individually open	Each fault identified; plausible false values documented
Source fault/warm-up	Error is not accepted as a healthy reading
Dummy accessories switching	No ground-noise false trigger
ESP reboot / phone absent	Saved settings return; local actions behave correctly
Logging outside live screen	Achieved timestamps and gaps recorded

An endpoint-clamped analogue value can conceal a failed source. If a required fault is indistinguishable, retain independent native protection or qualify another status source. An unresolved failure state is a hold point.

Record vehicle, FD serial/board, firmware/iOS build, accessory identity/revision, connector photos, occupied IO, calibration, retained/lost functions, test-log files, installer and date. Reconnect accepted loads only, then repeat a controlled functional run. Keep the original configuration and reversal procedure.



— AEM 30-2200 ETHANOL + FUEL TEMPERATURE

Sources and review scope

[M1] AEM Flex Fuel Sensor Kit30-2200/30-2201, instruction 10-220X,20 April 2016, pp 2-5.

https://documents.aemelectronics.com/techlibrary_30-2200_flex_fuel_content_sensor_kit.pdf

Identification image: the barbed 30-2200 sensor illustration extracted from the official AEM10-220X manual p1. The 30-2201 AN-fitting illustration is not substituted.

FD implementation checked against HardwareMap.swift, SensorsView.swift, SensorManager.swift, CANBusConfigurationView.swift, CANDecodeEditorView.swift, AutomationEditorView.swift and DataLog/LogSettingsView.swift in the local FD project. Electrical interfaces and native operating facts above come from the named manufacturer sources. Any extra interface remains conditional until its actual part, wiring, range and fault behaviour are recorded and tested. No live website publication or physical compatibility certification is implied.



Questions?

Documentation · fusiondrive.io/docs

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

Review library · [Local FD V3](#) / [accessory-integration](#) / [model-guides](#)

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. Independent local review draft. Exact-model electrical compatibility and the commissioning tests in this guide have not received physical sign-off. Product photographs and manufacturer names identify equipment only; no manufacturer endorsement is implied. Follow the matching original manual and the qualification requirements for each proposed interface. No universal replacement or load-rating approval is given.