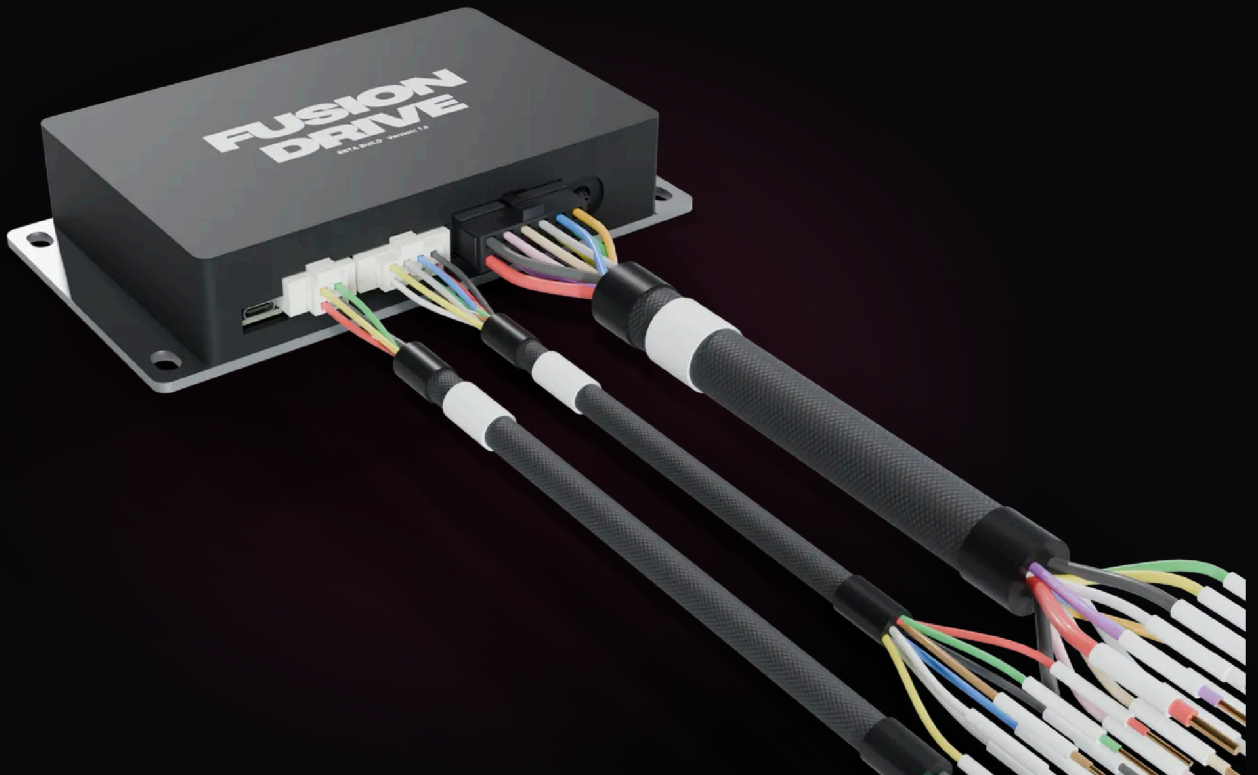




— EXACT-MODEL INSTALLATION GUIDE

Zeitronix KT-4

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



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1

— ZEITRONIX KT-4

Identify the exact product and choose the result

Match KT-4, its four T1-T4 thermocouple connectors, labelled SIGNAL/GAUGE/DATA ports and the CAN mark. Each probe must be K-type. The small Molex connection is polarity-sensitive: use the manufacturer's plus/minus connector illustration or its terminated mini-K extension harness. Probe-wire colours vary by thermocouple standard and are not a universal pinout.



Zeitronix KT-4 four-channel K-type thermocouple amplifier — manufacturer identification image; verify physical revision and connector labels.

Keep a KLCD or existing logger while FD displays four physical temperature locations in one timeline. Those locations can be EGT, coolant, oil, intake, brakes or another suitable K-probe installation; name them by actual location. CAN preserves the documented 0–1350 °C digital range. The analog alternative is narrower because the 0–5 V transfer reaches 1024 °C at 5 V.

This independent FD Design LS guide is a researched connection design for local review, not a passed physical test. Manufacturer references establish interfaces; FD steps are checked against local implementation. Identify both ends before wiring.

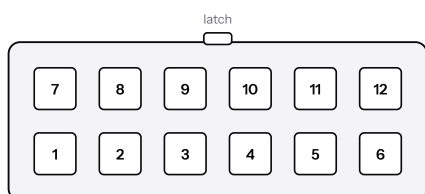
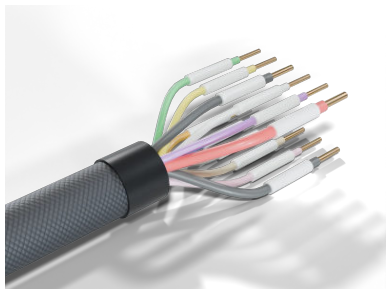
2

— ZEITRONIX KT-4

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

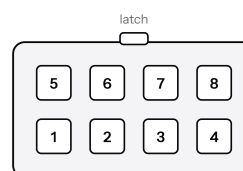
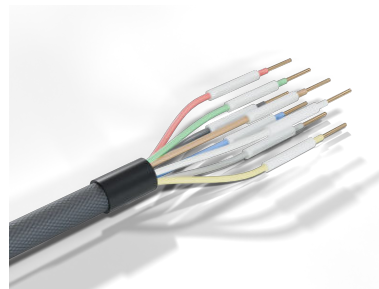


Bottom row, left to right: 1 BATT+ · 2 AUX1 · 3 IGN · 4 GND · 5 CAN2 H · 6 CAN2 L
Top row, left to right: 7 GND · 8 AUX2 · 9 OUT4 · 10 OUT3 · 11 OUT2 · 12 OUT1

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

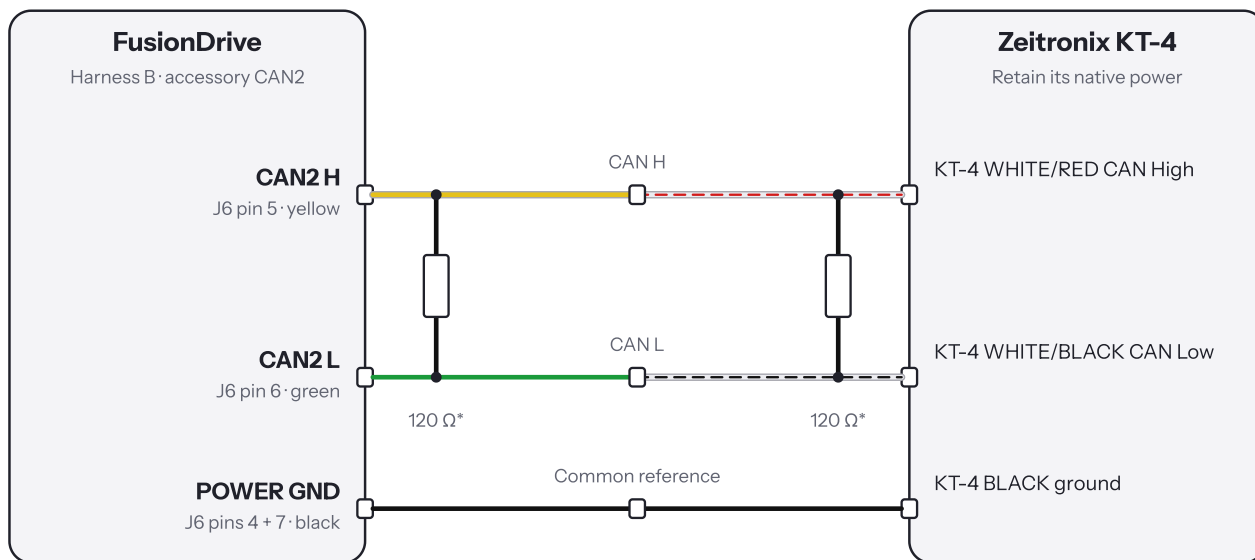
Looking into the plug's mating face with the latch at the top

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 • Zeitronix KT-4 to FD CAN2**
2. **W2 • Zeitronix KT-4 conditioned analog outputs to FD**

2.1 W1 • Zeitronix KT-4 to FD CAN2



*Exactly two end terminations in the complete bus. Use existing resistors; add only missing ones.

Keep H/L twisted. The reference conductor is separate from the CAN pair. Match bitrate and frame format.

Receive documented accessory measurements while the original conditioner and sensor wiring remain in service.

Terminal-to-terminal wiring schedule

From	To	Signal / electrical condition
KT-4 WHITE/RED CAN High	FD J6 pin 5 CAN2 H	CAN H differential high
KT-4 WHITE/BLACK CAN Low	FD J6 pin 6 CAN2 L	CAN L differential low
KT-4 BLACK ground	FD J6 pins 4 and 7 GND	reference common grounding point; retain original power returns

OFF / released: Accessory or valid source absent: measurement cannot grant an output permission.

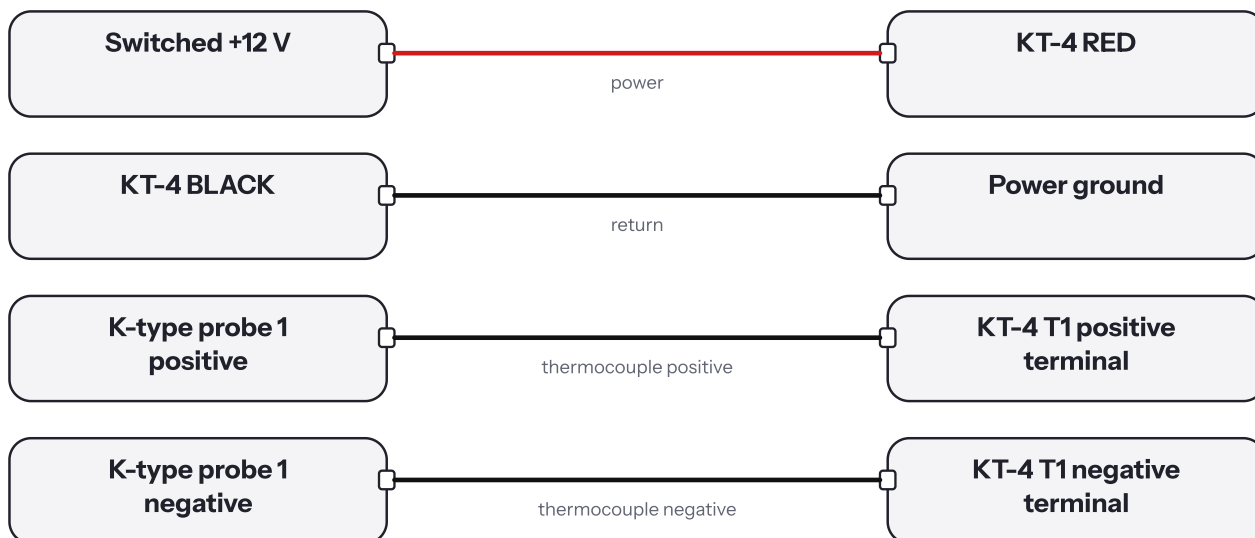
ON / active: Accessory measures; FD receives and decodes named signals. No ECU or accessory commands are introduced.

Qualification: No internal 120 Ω terminator. Use K-type polarity-correct harnesses. Missing-probe error encoding is not published as a numeric CAN sentinel in these sources.

Accessory-side connections - 1

Zeitronix KT-4 · accessory-side connections

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



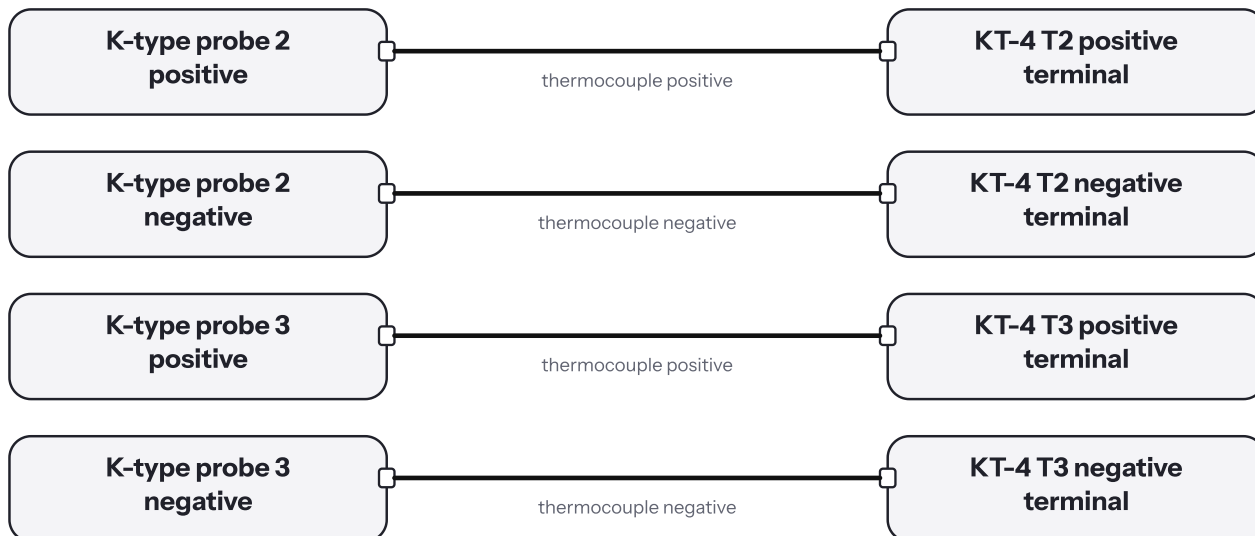
Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

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

Zeitronix KT-4 · accessory-side connections

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



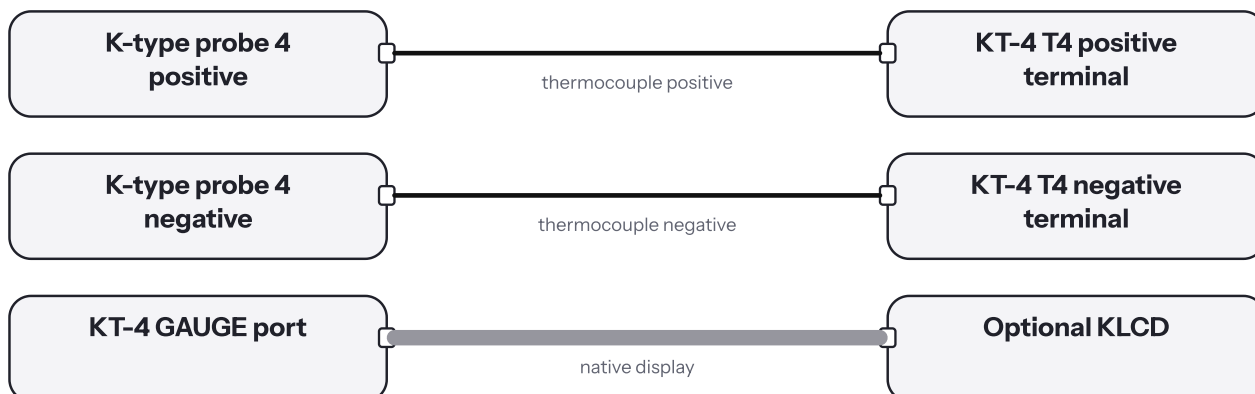
Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

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 - 3

Zeitronix KT-4 · accessory-side connections

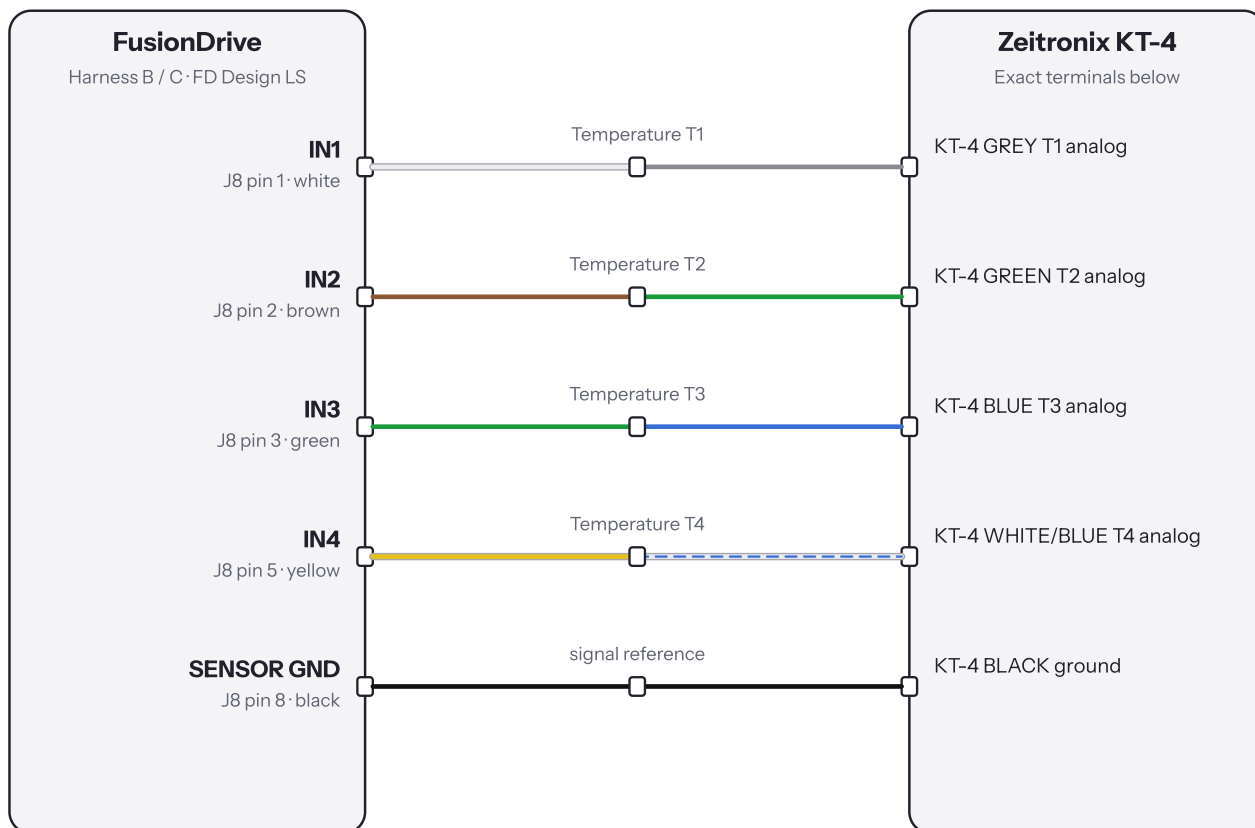
Accessory connections for the selected route. Grey bands are complete looms; blue dashes are pressure hoses.



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.

2.2 W2 • Zeitronix KT-4 conditioned analog outputs to FD



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.

Retain the manufacturer controller; connect only its documented logging output and reference to FD.

Terminal-to-terminal wiring schedule

From	To	Signal / electrical condition
KT-4 GREY T1 analog	FD J8 pin 1 IN1	Temperature T1 0–5 V conditioned output
KT-4 GREEN T2 analog	FD J8 pin 2 IN2	Temperature T2 0–5 V conditioned output
KT-4 BLUE T3 analog	FD J8 pin 3 IN3	Temperature T3 0–5 V conditioned output
KT-4 WHITE/BLUE T4 analog	FD J8 pin 5 IN4	Temperature T4 0–5 V conditioned output
KT-4 BLACK ground	FD J8 pin 8 GND	signal reference no heater, pump or solenoid return current

OFF / released: Missing power, readiness or signal: qualify the resulting voltage and block dependent permissions.

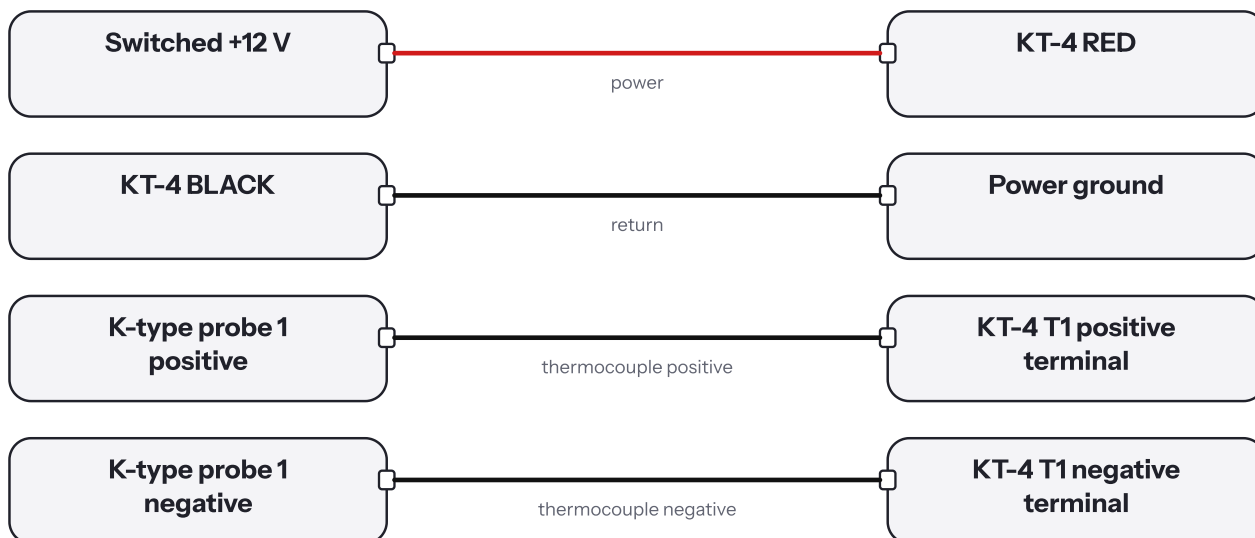
ON / active: FD converts documented connector voltage to the named engineering unit.

Qualification: Leave J8 pin 4 unconnected: the accessory retains its own supply and sensor conditioning. Never connect a raw wideband or thermocouple lead to J8.

Accessory-side connections - 1

Zeitronix KT-4 · accessory-side connections

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



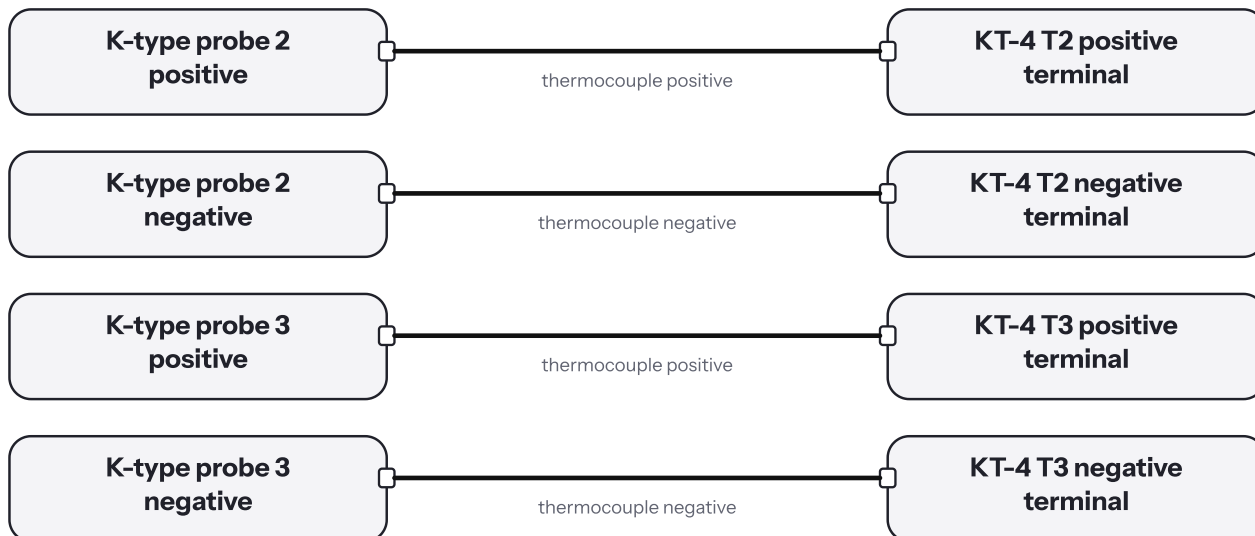
Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

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

Zeitronix KT-4 · accessory-side connections

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



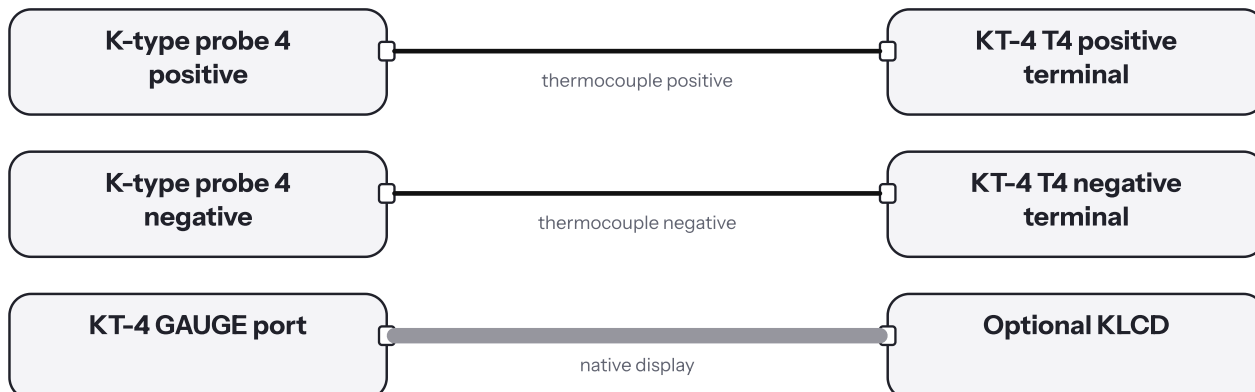
Match the exact harness/revision in the source manual. Unspecified wire colours are drawn black.

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 - 3

Zeitronix KT-4 · 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

— ZEITRONIX KT-4

Prepare the installation

- 1 Save the native configuration, photographs and a baseline log. Record product revision, FD LS serial and firmware/iOS build.
- 2 Isolate power and controlled loads. Check connector cavity markings and the manufacturer view: mating views can mirror pin order.
- 3 Keep the original sensor/controller supply, fuse and power-return path. A signal-reference lead must not become a replacement high-current return.
- 4 Reserve the named FD inputs or CAN2 signals. If a physical input is occupied, assign another free input and update the harness label, app name and acceptance record together.
- 5 Route CAN as a twisted trunk with short branches and exactly two appropriate end terminators. Check existing termination before adding parts. About 60 Ω across an unpowered complete bus is a useful two-120 Ω check, not proof of correct wiring.
- 6 Keep vehicle OBD/CAN1 separate from accessory CAN2. Never join their H/L pairs simply to make an accessory visible in both places.
- 7 Use proper terminals, insulation and strain relief. First test with isolated loads and an independent instrument.

4

— ZEITRONIX KT-4

Route A — retain the system and add CAN2

Record the probe type, physical location, lead polarity and channel number first. Retain the native KLCD if it provides a required always-visible warning. The CAN defaults are standard 0x004B, 500 kbit/s and 125 ms/8 Hz. Use the Zeitronix serial cable and ZDL for ID or bus changes. A second KT-4 must have another ID; map its channels by both module and location. On the KLCD, the default EGT presentation has a 100 °C minimum display; its setup can rename the input and show lower values. That display floor does not redefine FD's Celsius calibration or prove a probe is missing.

4.1 Native electrical schedule

Native terminal or wire	Documented function	Installation decision
RED / BLACK	Switched +12 V / ground	Keep native power; internal 1 A resettable fuse
WHITE/RED / WHITE/BLACK	CAN H / CAN L	FD J6-5 / J6-6
GREY / GREEN	T1 / T2 analog	Optional IN1 J8-1 / IN2 J8-2
BLUE / WHITE/BLUE	T3 / T4 analog	Optional IN3 J8-3 / IN4 J8-5
T1-T4 thermocouple connectors	K-type positive and negative	Stay on KT-4, never raw to J8

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

4.2 Configure the FD CAN signals

Worked network: 500 kbit/s default; standard 11-bit 0x04B default.

- 1 In real device mode open More > OBD Settings > Accessories · CAN2. Enable CAN2 — Accessories, select the saved bitrate, save and reload.
- 2 Initially leave Allow transmitting off and observe the existing network. If FD is the only receiver, a silent/listen-only receiver cannot provide CAN acknowledgement; use an ACK-capable qualified node or deliberately enable normal operation with all custom transmit/poll rules absent.
- 3 Open Accessory signals & decoders. Verify ID, standard/extended identity, DLC and cadence, then choose the observed frame and Add signal.

- 4 Set Accessory/device name and a unique physical signal name. For a byte recipe leave Packed bit layout off and enter the table's byte offset/length, signedness, multiplier, offset and unit. Turn Motorola/big endian on where specified.
- 5 For a packed-bit recipe use its specified start/length and endian rule. Do not substitute whole-byte positions for bit positions. Add separate definitions for value and health/status fields.
- 6 Save each definition to the ESP and reload. Compare against the native instrument/reference. Arithmetic examples check configuration, not physical sensing.
- 7 Reboot and confirm read-back. FD stores its decoder; the accessory stores its native configuration. Retain both records.

Signal / frame	Byte position	Layout	Multiplier	Offset	Unit
T1	0-1	2 bytes, unsigned, big endian	1	0	°C
T2	2-3	2 bytes, unsigned, big endian	1	0	°C
T3	4-5	2 bytes, unsigned, big endian	1	0	°C
T4	6-7	2 bytes, unsigned, big endian	1	0	°C

The current product page explicitly gives big-endian 16-bit Celsius words; the instructions give their byte pairs. A raw 0x0320 means 800 °C. This source sends at 8 Hz. It does not publish a numeric missing-probe sentinel or a separate status byte in this frame. Check the native T1-T4 presence LEDs and establish missing/open/reversed-probe behavior before using a temperature for any critical permission; freshness alone only proves the module is sending.

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— ZEITRONIX KT-4

Conditioned analog connection and FD setup

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.

Use wiring diagram W2 in the Wiring diagrams chapter for the exact connections. Return here for the installation and app setup steps.

For an unused input card, open Sensors and tap that exact card. The floating plus chooses the first free input automatically; it does not offer a later pin picker. Confirm the slot/header, choose Sensor type 0–5 V Generic, Type Analog, temporary Unit V, enter the physical signal name and tap Create. Open the card's Edit action, enter the required free-text unit and keep Additional voltage scale at 1. FD already compensates its input divider.

Enter the voltage and engineering endpoints below, save to the device and reload. Reopen Edit and compare Connector voltage with a meter referenced to J8-8, then compare mapped value with the native source. Use several intermediate values and record tolerances. Display Range and Show on Dashboard affect presentation, not electrical validity. Leave J8 pin 4 +5 V unconnected for all conditioned-output routes in this book. Never parallel an accessory output with another active driver.

Signal	FD input	Unit	Min V	Max V	Min value	Max value
T1	IN1 / J8-1	°C	0	5	0	1024
T2	IN2 / J8-2	°C	0	5	0	1024
T3	IN3 / J8-3	°C	0	5	0	1024
T4	IN4 / J8-5	°C	0	5	0	1024

The published equation $V = (5/1024) \times \text{temperature}$ gives temperature $204.8 \times V$. At 2.5 V expect 512 °C. Do not enter 1350 °C as the 5 V endpoint: that would mis-scale every analog reading. Because the stated analog range is 0–5 V, use CAN for measurement above 1024 °C and qualify analog saturation rather than treating 5 V as

proof of the true high temperature.

6

— ZEITRONIX KT-4

Route B — replace a display or migrate the measurement

Removing a KLCD or old temperature display leaves KT-4 and its K-type probes in service. FD replaces the display/logger role, not cold-junction compensation or thermocouple amplification. If moving probes from another EGT instrument, verify K-type compatibility, polarity, lead/connector materials and grounding before assigning one owner to each probe. A raw thermocouple cannot be converted into a calibrated FD analog input merely by entering a voltage range.

- 1 Prove Route A, then identify the exact receiver being removed.
- 2 Assign an owner for sensing, excitation/heater, calibration, faults, ECU feedback, warnings and logging.
- 3 Preserve required feedback/protection. Never join driven outputs or parallel supplies.
- 4 Repeat calibration, startup/fault and read-back tests; retain service access.
- 5 Provide a verified physical indication for warnings needed without the phone.

6.1 Functions and limits to record

Four thermocouple channels do not establish four exhaust-cylinder measurements unless probes are physically installed there. Cold-junction compensation stays in KT-4. FD cannot synthesize per-cylinder ECU fuelling from these measurements, and a phone graph is unavailable as a physical warning when the phone is absent.



— ZEITRONIX KT-4

Automations, logging and useful comparisons

A bench “temperature review” indicator can combine fresh named channels and an approved bound, but a high-temperature cut requires proven probe fault behavior and an independent protection strategy. Do not implement “temperature below limit = healthy” while an open probe can produce an unqualified low value.

Start with the rule disabled and an isolated dummy output. Choose ALL conditions (AND) where health gates must accompany a measurement threshold. Use the actual configured source name and unit; require valid/fresh data and the documented accessory status. For analog inputs, the app offers the configured name's Valid, Connector voltage and Acquisition age fields. Valid is an ON/OFF condition; age is in milliseconds. Source communication validity is not the same as a healthy sensor.

For a qualified AUX permission, establish its off value 0 and exclusive ownership first. Test Duty 100% with Restore Previous Value When False, captured previous value 0, and release delay 0. Prove missing-source release physically. Respect the reported condition limit; never omit necessary gates.

In Data Log settings select measurements, source status and relevant RPM, throttle, MAP/boost, controller states and automation transitions. Commanded duty or permission is different from measured pressure, flow, mixture or temperature.

Check achieved timestamps, gaps and repeated values after leaving live screens. CAN broadcast rate does not guarantee phone storage rate. Note calibration, location, native settings and firmware. Cloud and Intelligence support comparisons and trends; they cannot guarantee diagnosis from uncertain measurements.

Verify ESP rules/configuration survive reboot and phone disconnection. The phone/portal are viewports and editors. An absent phone cannot record new samples even while local control continues.



— ZEITRONIX KT-4

Commission and record the actual result

Use a traceable thermocouple simulator or controlled temperature reference for several points; verify each physical probe changes only its intended channel. Test an open probe, reversed polarity, controller-power loss and communication loss. Record native LED indication and the exact CAN/analog outputs seen; unresolved error behavior keeps control use unqualified.

Check	Required result	Record
Baseline before FD	Original display/ECU/ABS or logger behavior recorded	Project file, photos, native log
Low/middle/high reference	Correct unit, polarity, transfer and physical channel	Reference and FD readings
Startup and readiness	Warm-up is not accepted as a healthy measurement	Native state and FD trace
Sensor loss/fault	Dependent permission releases or remains unqualified	Actual status/voltage and time
Controller/CAN power loss	Last value cannot masquerade as fresh data	Missing-source trace
FD reboot / phone absent	Saved definitions and local behavior confirmed	Read-back and dummy-output result
Existing receivers	Their function remains correct after connection	Comparison and fault scan

Record vehicle, serials/revisions, sensor location, pins/IDs, calibration, reference, response time, software builds and installer/date. Mark retained, replaced and omitted functions. Unresolved behavior stays out of actuator permissions.



— ZEITRONIX KT-4

Sources and image attribution

[OEM] Zeitronix KT-4 instructions, copyright 2024; current product specification; pages/sections 1.

https://www.zeitronix.com/installation/KT-4_Instructions.pdf

[WEB] Zeitronix KT-4 current product specification; pages/sections CAN DATA / analog output sections.

<https://www.zeitronix.com/Products/KT-4/KT-4.shtml>

Product image: manufacturer photograph or manual identification detail. Source, extraction and SHA256: image-manifest.json. Verify connector orientation and PCB revision independently.

FD implementation evidence: ios/FusionDrive/Models/HardwareMap.swift;

Features/Sensors/SensorsView.swift; Features/OBD/CANDecodeEditorView.swift and

CANBusConfigurationView.swift; Features/Automations/AutomationEditorView.swift;

ESP/FusionDrive/modules/can/CANSignalDecoder.h; docs/V1_LS_HARDWARE_LIMITATIONS.md. These are implementation references, not completed electrical qualification records.



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.