Thermocouple to DC Isolated Transmitters, Microprocessor-Based

API 4130 G L

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**Input:** Thermocouples J, K, T, E, R, S, N, B, C, D, G, M, P

**Output:**
- 0-1 V to 0-10 V, ±1 V to ±10 V, 0-1 mA to 25 mA, 4-20 mA

- Convert Temperature to DC Output
- Zero and Span Output Calibration Potentiometers
- Automatic Temperature Compensation
- Input and Output LoopTracker® LEDs
- Output Test Button
- Built-In Loop Power Supply for Output

**Applications**

- Convert Output From Thermocouple Sensor for PLC Input, Control and/or Validation
- Interface an Thermocouple with Panel Meters, PLCs, Recorders, Data Acq., DCS, & SCADA Systems

**Thermocouple Input Types, Factory Set**

- Specify thermocouple type and temperature range in °F or °C

Full ANSI temperature ranges

- Linearization: 41-55 segment or up to 14th order polynomial

**Cold Junction Compensation**

- Automatic for specified thermocouple

**T/C Burnout Protection**

- Upscale burnout protection standard
- B option: Downscale burnout protection
- N option: None, last valid value

**T/C Current**

- Less than 10 μA, including burnout sense

**LoopTracker**

- Variable brightness LEDs indicate I/O loop level and status

**Status LED**

- Yellow LED indicates I/O errors

**DC Output Range**

- Factory ranged: specify output type and range
- Voltage: 0-1 VDC to 0-10 VDC, 10 mA max
- Bipolar voltage: ±1 VDC to ±10 VDC
- Current: 0-1 mA to 0-25 mA, 4-20 mA
- 20 V compliance, 1000 Ω at 20 mA

**Calibration**

- Multi-turn zero and span potentiometers for output
- ±15% of span adjustment range typical

**Output Loop Power Supply**

- 20 VDC nominal, regulated, 25 mA DC, max. ripple <10 mV RMS

**Output Test**

- Sets output to test level when pressed
- Test level factory set to approx. 50% of span
- Call factory for custom setting

**Output Ripple and Noise**

- Less than 10 mV RMS

**Accuracy**

- ±0.25% of span typical, 16-bit analog output
- HA option: ±0.1% of span typical, 18-bit analog output

**Ambient Temperature Range and Stability**

- −10°C to +60°C operating ambient
- Better than ±0.04% of span per °C stabilization, calculated, not tested

**Response Time**

- 300 milliseconds typical

**Isolation**

- 2000 V RMS minimum

**Installation Environment**

- IP 40, requires installation in panel or enclosure
- Use with API 008 or API 008 FS socket
- Socket mounts to 35 mm DIN rail or can be surface mounted
- UL 508C pollution degree 2 environments or better

**Power**

- Standard: 115 VAC ±10%, 50/60 Hz, 2.5 W max.
- A230 option: 230 VAC ±10%, 50/60 Hz, 2.5 W max.
- P option: 85-265 VAC 50/60 Hz, 6-300 VDC 2.5 W typ.
- D option: 9-30 VDC, 2.5 W typical

**Sourcing Output**

- The API 4130 G L has a 20 VDC loop excitation supply for the output. This power supply can be used to power a passive mA device.

**LoopTracker**

- API exclusive features include LoopTracker LEDs (green for input, red for output) that vary in intensity with changes in the process input and output signals.
- They provide a quick visual picture of your process loop at all times and can greatly aid in saving time during initial startup and troubleshooting.

**Output Test**

- An API exclusive feature includes an output test button to provide a fixed output (independent of the input) when held depressed. The output test greatly aids in saving time during initial startup and/or troubleshooting. The test output level is factory set at 50% of output span.

**Mounting**

- The API 4130 G L plugs into an industry standard 8-pin octal socket sold separately. Sockets API 008 and finger-safe API 008 FS allow either DIN rail or panel mounting.

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**Model** | **Input** | **Output** | **Power**
---|---|---|---
API 4130 G L | Factory configured | Factory configured | 115 VAC
API 4130 G L A230 | Specify thermocouple type and temperature range in °F or °C | specify output range in volts or mA | 115 VAC
API 4130 G L P | | | 230 VAC
API 4130 G L D | | | 85-265 VAC or 60-300 VDC

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**Options—add to end of model number**

- HA: High accuracy, ±0.1% span
- B: Downscale T/C burnout protection
- N: No T/C burnout protection
- U: Conformal coating for moisture resistance

**Accessories—order as separate line item**

- API 008: 8-pin socket
- API 008 FS: 8-pin finger-safe socket
- API CLP1: Module hold-down spring for high vibration or mobile applications

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**Free Factory I/O Setup!**

**Quick Link**

api-usa.com/4130

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Precautions

ATTENTION! Tout le câblage doit être effectué par un électricien ou ingénieur en instrumentation qualifié. Voir le diagramme pour désignations des bornes et des exemples de câblage. Consulter l’usine pour assistance.

ATTENTION! Éviter les risques de choc! Fermez le signal d’entrée, le signal de sortie et l’alimentation électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d’installer le module.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. See api-usa.com for latest product information. Consult factory for your specific requirements.

WARNING: All wiring must be performed by a qualified electrician or instrumentation engineer. See diagram for terminal designations and wiring examples. Consult factory for assistance.

WARNING! Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring, or removing or installing module.

Electrical Connections

See model/serial number label for module power requirements, and any applicable options or custom ranges. The sensor type and temperature range are factory configured. See the model/serial number label for module information, sensor type, temperature range and options. Polarity must be observed for output wiring connections. If the output does not function, check wiring polarity.

Thermocouple Input Block

The thermocouple connection is made to the block on the side of the module. Polarity must be observed. ANSI/ASTM thermocouples use red for negative, IEC thermocouples use white for negative. Other countries’ standards may use other color coding.

Signal Output

Polarity must be observed when connecting the signal output to the load. The positive connection (+) is connected to terminal 7 and the negative (–) is connected to terminal 8.

Note that with a current output the module provides power to the output loop.

Module Power

Check model/serial number label for module operating voltage to make sure it matches available power.

AC power is connected to terminals 1 and 3.

For DC powered modules, polarity MUST be observed.

Positive (+) is wired to terminal 1

Negative (–) is wired to terminal 3

Plug-in Module

Socket and Mounting

Install module in a protective panel or enclosure. Allow space around module for air flow. Use API 008 or API 008 FS socket. See specifications for maximum allowable socket voltages. The socket clips to a standard 35 mm DIN rail or can be mounted to a flat surface.

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Output Test Function

When the Test button is depressed it will drive the output with a known good signal that can be used as a diagnostic aid during initial start-up or troubleshooting. When released, the output will return to normal.

The Test Cal. level is factory set to approximately 50% output. Example: If you are checking a 4-20 mA current loop, when the push button is held depressed, the output from the module will be approximately 12 mA.

Operation

The API 4130 accepts a temperature input and provides a linearized and optically isolated DC voltage or current output. The green LoopTracker® input LED provides a visual indication that a signal is being sensed by the input circuitry of the module. It also indicates the input signal strength by changing in intensity as the process changes from minimum to maximum. If the LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring. Note that it may be difficult to see the LEDs under bright lighting conditions.

For a current output, the red LED will only light if the output loop current path is complete. For either current or voltage outputs, failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module power or signal output wiring.

The yellow status LED provides a visual indication of operational modes.

Normal operation: Off

Push-to-Test mode: Steadily on

Operational error: Blinking 2 digit code as listed below.

Check sensor and wiring, or consult factory.

1 1 Analog-digital converter out-of-range

1 2 Sensor under range

1 3 Sensor over range

1 4 CJC sensor abnormal range

1 5 CJC failure

1 6 Hard ADC out-of-range

1 7 Sensor hard fault

Quick check: disconnect the thermocouple and install a jumper across the thermocouple input connection. If the error code goes away, check thermocouple and thermocouple wiring.