Thermocouple to DC Isolated Transmitters

See new version for improved perfomance

API 4130 G L

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 20 mA, 4-20 mA

Version before 7-12-16

- *Convert Temperature to DC Output*
- *Zero and Span for Output*
- *Automatic Temperature Compensation*
- *Input and Output LoopTracker® LEDs*
- *Output Test Button*
- *Built-In Loop Power Supply for Sink/Source 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 Range

Factory configured, please specify thermocouple type and temperature range in °F or °C

Thermocouples: J, K, T, E, R, S, N, B, C, D, G, M, P
Full ANSI temperature ranges

Note: 5 mV is the recommended minimum span <still true?

Cold Junction Compensation

Automatic for specified thermocouple

T/C Burnout Protection

Upscale burnout protection standard

B option: Downscale burnout protection

T/C Current

Less than 10 µA, including burnout sense

LoopTracker

Variable brightness LEDs indicate I/O loop level and status

DC Output Range

Factory ranged, please 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 mADC to 0-25 mADC, 4-20 mADC
20 V compliance, 1000 Ω at 20 mA

Calibration

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

Output Ripple and Noise

Less than 10 mVRMS

Output Loop Power Supply

20 VDC nominal, regulated, 25 mADC, max. ripple <10 mVRMS
EXTSUP option: Unpowered mA output

Output Test

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

Accuracy

Typical: ±0.25% of span
HA option, typical: ±0.1% of span
Accuracy includes adjustment resolution and linearity
Better than 0.04% of span per °C temperature stability

Response Time

300 milliseconds typical

Isolation

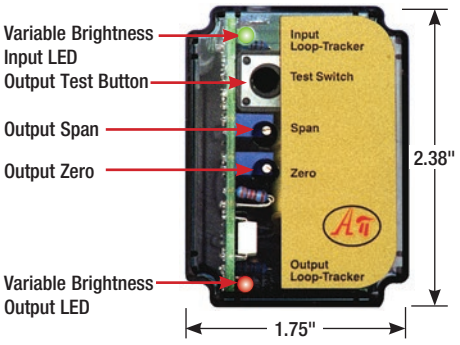
2000 VRMS minimum
Full isolation: power to input, power to output, input to output

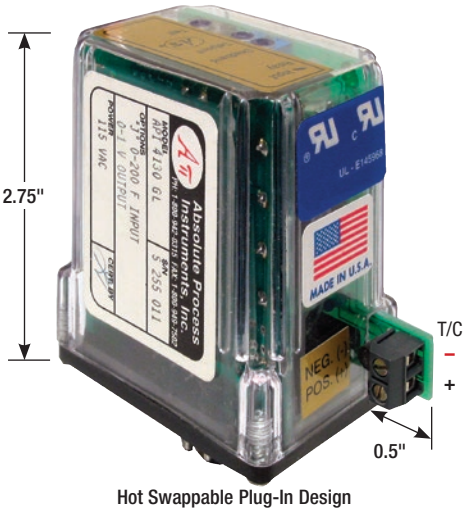
Installation Environment

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
–10°C to +60°C operating ambient

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, 60-300 VDC 2.5 W typ.
D option: 9-30 VDC, 2.5 W typical





Hot Swappable Plug-In Design

LIFETIME WARRANTY

MADE IN USA

c UL us
E145968
115 VAC, 230 VAC
powered models

Free Factory I/O Setup!

Quick Link
api-usa.com/4130

Description

The API 4130 G L accepts a thermocouple input and provides an optically isolated and linearized DC voltage or current output. The thermocouple type, temperature span (°C or °F), and DC voltage or current output are factory configured.

Automatic cold-junction compensation and upscale burnout protection are standard, downscale burnout protection is optional.

The API 4130 GL features a thermocouple connection block on the side of the module. This allows direct temperature compensation at the T/C termination point eliminating cold junction errors.

The input is amplified, and then passed through an optocoupler to the output stage. Microprocessor-based linearization uses 41 to 55 segments or up to a 14th order polynomial depending on the sensor type. The low noise 16-bit analog output is isolated and can be set up for common voltage and milliamp output types.

Full 3-way isolation (input, output, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.

Sink/Source Output Options

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.

Order the API 4130 G L EXTSUP for an unpowered mA output for devices that are powered externally.

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.

Model	Input	Output	Power
API 4130 G L	Factory configured Specify thermocouple type and temperature range in °F or °C	Factory configured specify output range in volts or mA	115 VAC c UL us
API 4130 G L A230			230 VAC c UL us
API 4130 G L P			85-265 VAC or 60-300 VDC
API 4130 G L D			9-30 VDC

Options—add to end of model number

HA	High accuracy, ±0.1% span
B	Downscale T/C burnout protection instead of upscale
EXTSUP	Open collector output when a sinking output is required for an external loop supply
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

API 008 FS
300 V Rating

API 008
600 V Rating

API CLP1

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1220 American Way Libertyville, IL 60048
Phone: 800-942-0315 Fax: 800-949-7502

api-usa.com

Precautions
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.

Précautions
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.

Socket and Mounting
The module installation requires a protective panel or enclosure. Use API 008 or finger-safe API 008 FS socket.

The socket clips to a standard 35 mm DIN rail or can be attached to a flat surface using the two mounting holes.

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.

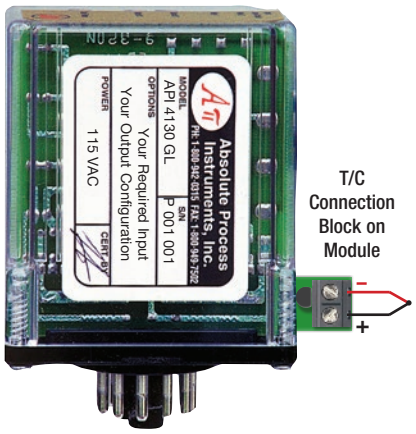
Signal Output
Polarity must be observed when connecting the signal output to the load. The positive connection (+) is connected to terminal 7 and the negative (–) is connected to terminal 8.

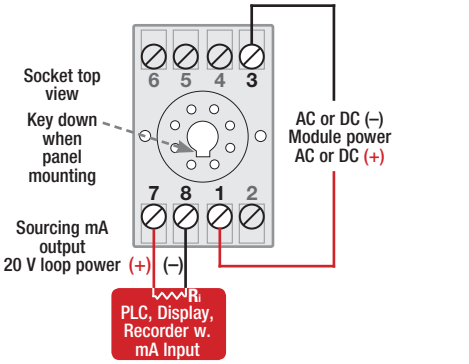
Note that with a current output the module provides power to the output loop unless option EXTSUP was ordered for a sinking output requirement.

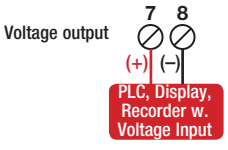
Module Power
Check model/serial number label for module operating voltage to make sure it matches available power.

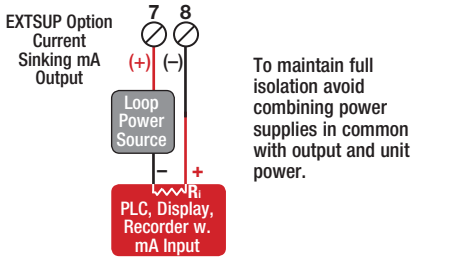
AC power is connected to terminals 1 and 3.

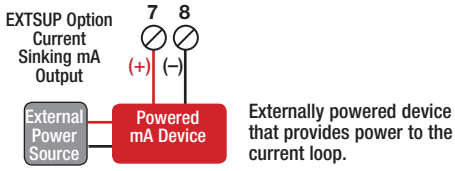
For DC powered modules, polarity MUST be observed.
Positive (+) is wired to terminal 1
Negative (–) is wired to terminal 3

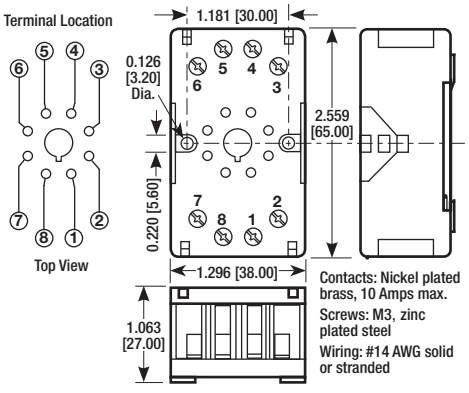




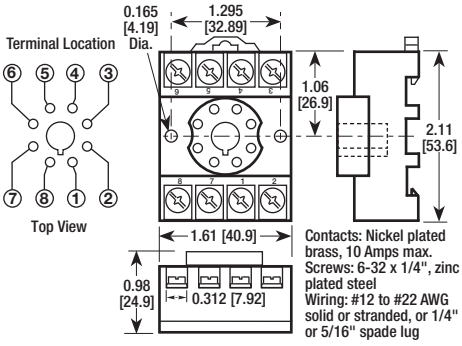








API 008 FS 8-Pin Finger Safe Socket



API 008 8-Pin Socket

Calibration
The API 4130 G L is factory configured to your exact input and output requirements.

Input and output ranges are listed on module labels. Input changes require factory modification.

Top-mounted Zero and Span potentiometers can be used should fine-tuning of the output be necessary.

1. Apply power to the module and allow a minimum 20 minute warm up time.
2. Using an accurate temperature simulator, provide an input to the module equal to the minimum input required for the application.
3. Using an accurate measurement device for the output, adjust the Zero potentiometer for the exact minimum output desired. The Zero control should only be adjusted when the input signal is at its minimum. This will produce the corresponding minimum output signal. Example: for 4-20 mA output, the Zero control will provide adjustment for the 4 mA or low end of the signal.
4. Set the input at maximum, and then adjust the Span pot for the exact maximum output desired. The Span control should only be adjusted when the input signal is at its maximum. This will produce the corresponding maximum output signal. Example: for 4-20 mA output, the Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for maximum accuracy.

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 GL is factory configured to your exact input and output requirements.

The input circuitry filters the T/C input, applies the cold-junction compensation, and amplifies the low-level T/C signal. The amplified signal first passes through an optical isolator, then is passed to the output stage where it is corrected for the inherent non-linearity of the specified T/C type and scaled to the desired output range.

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.

The red LoopTracker output LED provides a visual indication that the output signal is functioning. It becomes brighter as the input and output changes from minimum to maximum.

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.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Contact factory for assistance and see api-usa.com for latest datasheet version.