

**Input:** 0-50 mV to  $\pm 10$  VDC, 0-1 mA to 0-20 mA  
**Output:** 0-1 V to  $\pm 10$  VDC or 0-2 mA to 4-20 mA

**Wide Ranging I/O**  
**One Minute Setup!**

- One Minute Field Setup for Hundreds of I/O Ranges
- External Switches & Tables for Range Selection
- Full 2000 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- Output Test Button
- Built-In Loop Power Supplies for Input and Output

### Applications

- Convert, Boost, Rescale Process Signals
- One Model Covers Multiple Applications
- Interface Process Signals with Panel Meters, PLCs, Recorders, Data Acquisition, DCS, and SCADA Systems

### DC Input Ranges

See table on other side for field selectable ranges  
 Consult factory for special ranges  
 System voltages must not exceed socket voltage rating

Voltage: 0-50 mVDC to 0-10 VDC  
 Bipolar voltage:  $\pm 50$  mVDC to  $\pm 10$  VDC  
 Current: 0-1 mA to 0-20 mA

### Input Impedance

Voltage: 1 M $\Omega$  minimum  
 Current: 50  $\Omega$  typical  
 Input voltage burden (current) 1 VDC at 20 mA

### Common Mode Rejection

120 dB minimum

### Input Loop Power Supply

18 VDC nom., unregulated, 25 mA, max. ripple, <1.5 V<sub>p-p</sub>  
 May be selectively wired for sinking or sourcing mA input

### LoopTracker

Variable brightness LEDs indicate I/O loop level and status

### DC Output Ranges

See table on other side for field selectable ranges  
 Consult factory for special ranges  
 Internal jumper for output reversal

Voltage, 10 mA max.: 0-1 VDC to 0-10 VDC  
 Bipolar voltage:  $\pm 1$  VDC to  $\pm 10$  VDC  
 Current: 0-2 mA to 0-20 mA  
 20 V compliance, 1000  $\Omega$  at 20 mA

### Output Calibration

Multi-turn zero and span potentiometers for output  
 $\pm 15\%$  of span adjustment range typical

### Output Ripple and Noise

Less than 10 mV<sub>RMS</sub>

### Output Loop Power Supply

20 VDC nominal, regulated, 25 mA, max. ripple <10 mV<sub>RMS</sub>

### Output Test

Sets output to test level when pressed. Adjustable 0-100% of span. Potentiometer factory set to approx. 50% of span.

### Accuracy

$\pm 0.1\%$  of span (includes adjustment resolution and linearity)  
 Better than 0.04% of span per °C temperature stability

### Response Time

100 milliseconds typical  
 DF option: 1 millisecond typical, or consult factory

### Isolation

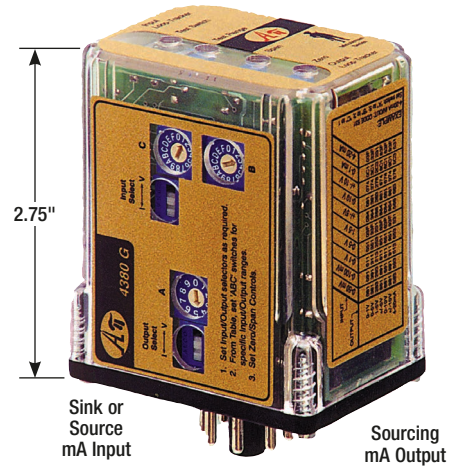
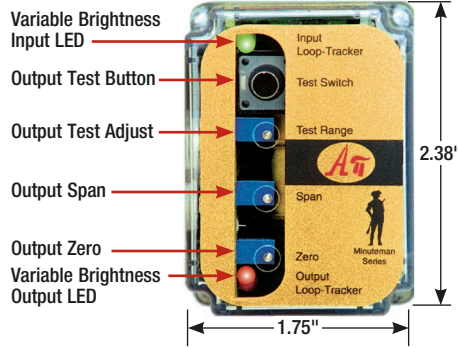
2000 VRMS minimum  
 Full isolation: power to input, power to output, input to output

### 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  $\pm 10\%$ , 50/60 Hz, 2.5 W max.  
 P option: 85-265 VAC 50/60 Hz, 60-300 VDC, 2.5 W  
 A230 option: 230 VAC  $\pm 10\%$ , 50/60 Hz, 2.5 W max.  
 D option: 9-30 VDC, 2.5 W typical



Free Factory I/O Setup!



Quick Link  
[api-usa.com/4380](http://api-usa.com/4380)

Hot Swappable Plug-In Design

  
 E145968  
 115 VAC, 230 VAC models



### Description

The API 4380 G accepts a DC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input. Typical applications include signal isolation, signal conversion, signal boosting or a combination of the three.

The optical isolation between input and output makes this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction. The module power supply is isolated, resulting in full 3-way (input, output, power) isolation.

The API 4380 G input and output can be field-configured via external rotary and slide switches. Common range settings are on the module label. Most common ranges are built-in, and can be selected from the table on the module, however virtually unlimited combinations are possible. Consult the factory for assistance with special ranges.

The built-in 18 VDC unregulated loop excitation power supply can be used to power passive input devices.

### LoopTracker

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

### Functional Test



An API exclusive feature includes the Functional Test Button to provide a fixed output (independent of the input) when held depressed. The test output level can be set via a potentiometer from 0 to 100% of the output span.

The functional test button greatly aids in saving time during initial startup and/or troubleshooting.

### Installation

The API 4380 G plug 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.

The plug-in design, 3-way isolation, and robust electronics allows the module to be quickly hot-swapped without removing the power or I/O signals.

Model	Input	Output	Power
API 4380 G	Field configurable Specify input range if factory is to set switches	Field configurable Specify output range if factory is to set switches	115 VAC 
API 4380 G A230			230 VAC 
API 4380 G P			85-265 VAC or 60-300 VDC
API 4380 G D			9-30 VDC

### Free Factory Setup

Specify I/O ranges if factory is to set switches

### Options—add to end of model number

- DF 1 millisecond response time, or consult factory
- 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

## 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.

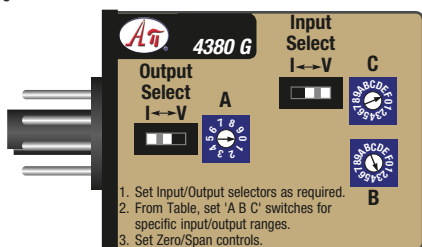
**ATTENTION!** Éviter les risques de choc! Fermez le signal d'entrée, le signal de sortie et l'alimentation électrique avant de connecter ou de déconnecter le câblage, ou de retirer ou d'installer le module.

## Socket and Mounting

The module installation requires a protective panel or enclosure. Use API 008 or finger-safe API 008 FS socket. See specifications for maximum allowable socket voltages. Note that some relay sockets may have lower voltage ratings. The socket clips to a standard 35 mm DIN rail or can be attached to a flat surface using the two mounting holes.

## Range Selection

Three rotary switches and two slide switches located on the side of the module are used to select input and output ranges. Popular ranges are listed on the module label or see table below.



1. Unplug the module from its socket. Do not change ranges while the module is powered.
2. Set the **Input Select** slide switch to current (I) or voltage (V) depending on input type. This sets the input impedance, typically 50 Ω for current inputs and 1 MΩ or greater for voltage inputs.
3. Set the **Output Select** slide switch to current (I) or voltage (V) depending on output type.
4. From the table, find the rotary switch combination that matches your input and output ranges.
5. Set the three rotary switches **A**, **B**, and **C** to the values found in the table.
6. Proceed to Calibration and Output Test Function setup

## Signal Input

Polarity must be observed when connecting the signal input. If your transmitter has a current output and provides power to the current loop, wire the device to terminals 6 and 5. Use a multi-meter to confirm voltage at the transmitter output terminals. Typical voltage may be in the range of 9 to 24 VDC.

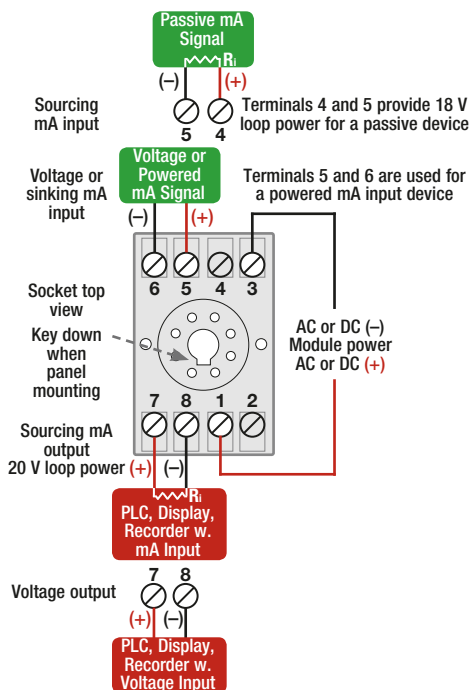
A passive input device can be powered by the 18 volt DC power supply at terminal 4. See wiring diagram for example.

## Signal Output

Polarity must be observed when connecting the signal output to the load. If the output does not function, check wiring, polarity, and correct setting of output select switch. When set up for milliamp output, the current loop will be powered by the API module.

## Module Power

AC power is connected to terminals 1 and 3. For DC powered modules (D option), polarity **MUST** be observed. Positive (+) is wired to terminal 1 and negative (-) is wired to terminal 3.



## Calibration

Top-mounted Zero and Span potentiometers calibrate the output.

1. Apply power to the module and allow a minimum 20 minute warm up time.
2. Using an accurate calibration source, 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. Next, set the input at maximum, 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

The Test button may be pushed to provide a fixed output when depressed. This will drive the device on the output side of the loop (a panel meter, chart recorder, etc.) with a known good signal that can be used as a system diagnostic aid during initial start-up or during troubleshooting.

It can be adjusted to vary the output signal from 0 to 100% of the calibrated output range. When released, the output will return to normal. Turn the multi-turn Test Range potentiometer while holding the Test Switch depressed until the desired output test level is reached.

## Operation

The API 4380 G input is filtered, either amplified or attenuated as required, then passed through an optical isolation circuit to the output stage.

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 the corresponding output change 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.

Output	0-1 V	0-2 V	0-4 V	1-5 V	0-5 V	0-8 V	2-10 V	0-10 V	±5 V	±10 V	0-2 mA	2-10 mA	0-10 mA	0-16 mA	4-20 mA	0-20 mA
Switches	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC
Input	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC	ABC
0-1 mA	0C1	1C1	2C1	2C3	3C1	5C1	5C3	6C1	8C1	9C1	0C1	2C3	3C1	5C1	5C3	6C1
0-2 mA	001	101	201	203	301	501	503	601	801	901	001	203	301	501	503	601
0-4 mA	011	111	211	213	311	511	513	611	811	911	011	213	311	511	513	611
0-8 mA	021	121	221	223	321	521	523	621	821	921	021	223	321	521	523	621
0-10 mA	041	141	241	243	341	541	543	641	841	941	041	243	341	541	543	641
0-16 mA	031	131	231	233	331	531	533	631	831	931	031	233	331	531	533	631
4-20 mA	03F	13F	23F	231	33F	53F	531	63F	83F	93F	03F	231	33F	53F	531	63F
0-20 mA	051	151	251	253	351	551	553	651	851	951	051	253	351	551	553	651
2-10 mA	02F	12F	22F	221	32F	52F	521	62F	82F	92F	02F	221	32F	52F	521	62F
0-50 mV	081	181	281	283	381	581	583	681	881	981	081	283	381	581	583	681
0-100 mV	091	191	291	293	391	591	593	691	891	991	091	293	391	591	593	691
0-200 mV	0A1	1A1	2A1	2A3	3A1	5A1	5A3	6A1	8A1	9A1	0A1	2A3	3A1	5A1	5A3	6A1
0-250 mV	0C1	1C1	2C1	2C3	3C1	5C1	5C3	6C1	8C1	9C1	0C1	2C3	3C1	5C1	5C3	6C1
0-400 mV	0B1	1B1	2B1	2B3	3B1	5B1	5B3	6B1	8B1	9B1	0B1	2B3	3B1	5B1	5B3	6B1
0-500 mV	001	101	201	203	301	501	503	601	801	901	001	203	301	501	503	601
0-1 V	011	111	211	213	311	511	513	611	811	911	011	213	311	511	513	611
0-2 V	021	121	221	223	321	521	523	621	821	921	021	223	321	521	523	621
0-2.5 V	041	141	241	243	341	541	543	641	841	941	041	243	341	541	543	641
0-4 V	031	131	231	233	331	531	533	631	831	931	031	233	331	531	533	631
0-5 V	051	151	251	253	351	551	553	651	851	951	051	253	351	551	553	651
1-5 V	03F	13F	23F	231	33F	53F	531	63F	83F	93F	03F	231	33F	53F	531	63F
±5 V	064	164	264	266	364	564	566	664	864	964	064	266	364	564	566	664
0-10 V	061	161	261	263	361	561	563	661	861	961	061	263	361	561	563	661
±10 V	074	174	274	276	374	574	576	674	874	974	074	276	374	574	576	674