Input: -50-0 mV to 20-40 VDC, 0-200 uA to 10-50 mADC 0-1 V to ±10 VDC or 0-2 mA to 4-20 mA **Output:**

- Non-Interactive Zero & Span
- One Minute Field Setup for Hundreds of I/O Ranges
- Full 2000 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- **Output Test Button**
- Built-In Loop Power Supplies for Input and Output

- 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

-50-0 mVDC 20-40 VDC Voltage: to Bipolar voltage: ±50 mVDC ±10 VDC to Current: 0-200 uADC to 10-50 mADC Offset: ±100% max., ±75% max. for 40 mA input

Input Impedance

Voltage: $1 M\Omega$ minimum Current: 50 Ω 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 mADC, max, ripple, <1.5 V_{D-D} 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: ±1 VDC to ±10 VDC Current: 0-2 mADC to 0-20 mADC 20 V compliance, 1000 Ω at 20 mA

Output Calibration

Non-interactive multi-turn zero and span potentiometers ±15% of span adjustment range typical

Output Ripple and Noise

Less than 10 mVRMS

Output Loop Power Supply

220 VDC nominal, regulated, 25 mADC, max. ripple <10 mVRMs

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

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

Response Time

70 milliseconds typical

DF option: 5 millisecond typical response time

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

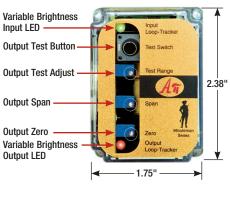
Socket mounts to 35 mm DIN rail or can be surface mounted UL 508C pollution degree 2 environments or better -10°C to +60°C operating ambient

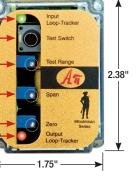
Power

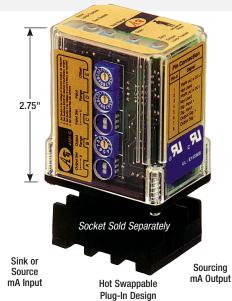
115 VAC ±10%, 50/60 Hz, 2.5 W max. Standard: P option: 85-265 VAC 50/60 Hz, 60-300 VDC, 2.5 W 230 VAC ±10%, 50/60 Hz, 2.5 W max. A230 ontion:

D option: 9-30 VDC, 2.5 W typical

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









IFÉTIME

VARRANT





ree Factor I/O Setup

Quick Link api-usa.com/4385

Description

The API 4385 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 $% \left(\frac{1}{2}\right) =\left(\frac{1}{2}\right) \left(\frac{1}{2}\right$ 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 or noise pickup reduction. The module power supply is isolated, resulting in full 3-way (input, output, power) isolation.

The API 4385 G input, output and zero offset can be fieldconfigured via external rotary and slide switches. Zero offset is adjustable in 15% increments to a maximum of ±100% of span. Common range settings are on the module label. Noninteractive zero and span adjustments simplifies calibration. Output reversal (4-20 mA input to 20-4 mA output) can be changed via an internal jumper.

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.

Output 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 4385 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 4385 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	c FM us
API 4385 G A230			230 VAC	c FL us
API 4385 G P			85-265 VAC or 60-300 VDC	
API 4385 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

M01 I/O reversal, such as 4-20 mA in to 20-4 mA out 5 millisecond response time, or consult factory Conformal coating for moisture resistance

Accessories-order as separate line item

API 008 8-pin socket

API 008 FS 8-pin finger-safe socket

Module hold-down spring for high vibration or API CLP1

mobile applications



API 008 FS

300 V Rating





API 008 600 V Rating

© 08-15

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.

Précaution:

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.

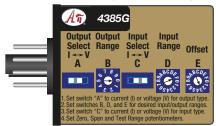
Socket and Mounting

The module requires a protective panel or enclosure. Use API 008 or finger-safe API 008 FS socket. See specifications for maximum allowable socket voltages. 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

Set I/O ranges first with the three rotary switches and two slide switches on the side of the module. Popular ranges are listed on the module label.

- Set the Output Select slide switch A to current (I) or voltage (V) depending on output type.
- 2. Set the **Input Select** slide switch ${\bf C}$ to current (I) or voltage (V) depending on input type. This determines the input impedance for the module, typically 50 Ω for current inputs and 1 M Ω or greater for voltage inputs.
- From the range table, find the rotary switch combination that matches your input and output ranges.
- 4. Set the three rotary switches **B**, **D**, and **E** to the values found in the table that match your input and output ranges.
- 5. Proceed to Calibration and Output Test Function setup.



Additional Ranges

The table at the bottom right can be used to set up special ranges. For example, if a 1-10 V input is required:

Set the Input Select switch to V.

Set switch \mathbf{D} to position C = 10 V.

Set switch \mathbf{E} to position 1 = +15% offset.

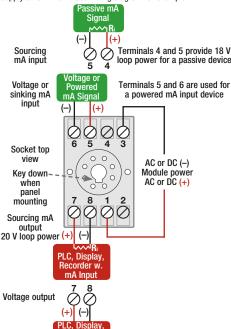
This will create an input range of 1.5 V to 11.5 V.

Use the zero and span potentiometers to calibrate output to desired range.

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.



0-1V 0-2V 0-4V 1-5V 0-5V 0-8V 2-10V 0-10V ±10V 0-2mA 2-10mA 0-10mA 4-20mA 0-20mA 0-16mA **Switches** RDF BDE **BDE** Input 0-200 μΑ 020 820 620 920 220 720 320 420 520 020 620 920 220 720 320 120 660 960 260 760 360 460 560 060 960 260 760 0-1 mA 060 860 160 660 360 0-2 mA 000 800 100 600 900 200 700 300 400 500 000 600 900 200 700 300 0-4 mA 010 810 110 610 910 210 710 310 410 510 010 610 910 210 710 310 0-8 mA 080 880 180 | 680 | 980 | 280 780 380 480 580 080 680 980 280 780 380 040 840 140 640 940 240 740 340 440 540 040 640 940 240 740 340 0-10 mA 090 890 190 690 990 290 790 390 490 590 090 690 990 290 790 390 0-16 mA 59A 99A 39A 4-20 mA 09A 89A 19A 69A 99A 29A 79A 39A 49A 09A 69A 29A 79A 0-20 mA 050 850 150 650 950 250 750 350 450 550 050 650 950 250 750 350 8CA 1CA 6CA 9CA 2CA 7CA 3CA 4CA 5CA 6CA 9CA 2CA 7CA 3CA 10-50 mA 0CA 0CA 02F 82F 12F 62F 92F 22F 72F 32F 42F 52F 02F 62F 92F 22F 72F 32F -50-0 mV 0-50 mV 020 820 120 620 920 220 720 320 420 520 020 620 920 220 720 320 730 330 530 930 0-100 mV 030 830 130 630 930 230 430 030 630 230 730 330 0-200 mV 0A0 8A0 1A0 6A0 9A0 2A0 7A0 3A0 4A0 5A0 0A0 6A0 9A0 2A0 7A0 3A0 0-250 mV 060 860 160 660 960 260 760 360 460 560 060 660 960 260 760 360 0-400 mV 0B0 8B0 1B0 6B0 9B0 2B0 **7B0** 3B0 4B0 5B0 0B0 6B0 9B0 2B0 7B0 3B0 0-500 mV 000 800 700 300 400 500 000 600 900 200 700 300 100 600 900 200 610 910 210 710 310 410 510 910 210 710 310 0-1 V 010 810 110 010 610 0-2 V 080 | 880 | 180 | 680 | 980 | 280 780 380 480 580 080 680 980 280 780 380 0-2.5 V 040 840 140 640 940 240 740 340 440 540 040 640 940 240 740 340 090 890 190 690 990 290 790 390 490 590 090 690 990 290 790 390 0-5 V 050 850 150 650 950 250 750 350 450 550 050 650 950 250 750 350 1-5 V 19A 69A 99A 29A 79A 39A 49A 59A 69A 99A 39A 09A 89A 09A 29A 79A 003 803 103 603 903 203 703 303 ±5 V 4C3 5C3 0C3 6C3 9C3 2C3 7C3 3C3 000 800 100 600 900 200 700 300 4C0 5C0 000 600 900 200 700 300 0-10 V ±10 V 003 803 1D3 6D3 903 2D3 7D3 3D3 4D3 5D3 003 6D3 903 2D3 7D3 3D3 0-20 V 0D0 8D0 1D0 6D0 9D0 2D0 7D0 3D0 4D0 5D0 0D0 6D0 9D0 2D0 7D0 3D0 ODF 8DF 1DF 6DF 9DF 2DF 7DF 3DF 4DF 5DF 6DF 9DF 2DF 7DF 3DF 20-40 V ODF

Signal Output

Polarity must be observed for output wiring connections. If the output does not function, check wiring and polarity.

When set up for current output (switch ${\bf A}$ to I), the output 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.

- Apply power to the module and allow a minimum 20 minute warm up time.
- 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 4385 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 4385 G User-Set Special Ranges										
Output Range			Input Span			Input Offset				
Voltage	Current	Sw.	Voltage	Current	Sw.	Input	Sw.			
A = V	A = I	В	C = V	C = I	D	Span %	E			
0-1 V	0-2 mA	0	50 mV	200 μΑ	2	+100%	7			
0-2 V	0-4 mA	8	100 mV	400 μA	3	+90%	6			
0-4 V	0-8 mA	1	200 mV	800 μΑ	Α	+75%	5			
0-5 V	0-10 mA	9	250 mV	1 mA	6	+60%	4			
0-8 V	0-16 mA	2	400 mV	1.6 mA	В	+45%	3			
0-10 V	0-20 mA	3	500 mV	2 mA	0	+30%	2			
1-5 V	2-10 mA	6	1 V	4 mA	1	+15%	1			
2-10 V	4-20 mA	7	2 V	8 mA	8	0%	0, 8			
±5 V		4	2.5 V	10 mA	4	-15%	9			
±10 V		5	4 V	16 mA	9	-30%	Α			
For ranges that are in		5 V	20 mA	5	-45%	В				
between listed ranges			10 V	40 mA*	C	-60%	C			
set to the next highest			20 V		D	-75%	D			
range and trim with			* Max. allowable offset			-90%	Е			
zero and span pots.			±75% for 40 mA			-100%	F			

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.

