



Input: 0-100 mV to 0-200 VDC or 0-1 mA to 0-50 mA
Outputs: One SPDT Relay, ± 10 VDC, 0-20 mA, Non-Isolated Transmitter

- Built-In 4-20 mA Loop Power Supply
- Field Adjustable Setpoints
- High Capacity 7 Amp Relay Contacts
- Input & Output LoopTracker® & Alarm Status LEDs
- Alarm Test/Reset Pushbutton

Applications

- Process Signal Retransmission with Limits
- Alarm and Rescale Process Signals

Specifications

Input Range

Factory Configured—Please specify input range (see list at right)

	Minimum	Maximum
Voltage:	0-100 mVDC	0-200 VDC
Current:	0-1 mADC	0-50 mADC

System voltages should not exceed socket voltage rating

Input Impedance (Voltage)

Voltage: 200 k Ω minimum

Input Voltage Burden (Current)

1.25 VDC maximum

Input Protection, Common Mode

750 VDC or 750 VAC_p

Input Loop Power Supply

18 VDC nominal, unregulated, 25 mADC, max. ripple less than 1.5 V_{p-p}

LoopTracker

Variable brightness LEDs indicate input/output loop level and status

Output Range

Factory Configured—Please specify output range (see list above right)

	Minimum	Maximum	Load Factor
Voltage:	0 to 1 VDC	± 10 VDC	
Current (20 V compliance):	0 to 2 mA	0 to 20 mA	1000 Ω at 20 mA

Output Zero and Span

Multiturn potentiometers to compensate for load and lead variations
 $\pm 15\%$ of span adjustment range typical

Output Linearity

Better than $\pm 0.1\%$ of span

Relay Output

Factory Configured—See Options for other relay configurations

One SPDT contact, High Alarm, Non-Latching Standard
 7 A @ 240 VAC resistive load or 3.5 A @ 240 VAC inductive load
 8 A @ 30 VDC maximum

CAUTION: Socket voltage rating may limit system rating. External contact protection such as an RC snubber is recommended for inductive loads.

Setpoint

12 turn potentiometer adjustable from 0 to 100% of span

Deadband

Adjustable from 1.0 to 100% of span, 12 turn potentiometer

Functional Test Button

Toggles relay to opposite state and sets output to test level when pressed.
 Resets relay to normal state when pressed with HT latching option

Response Time

70 milliseconds typical

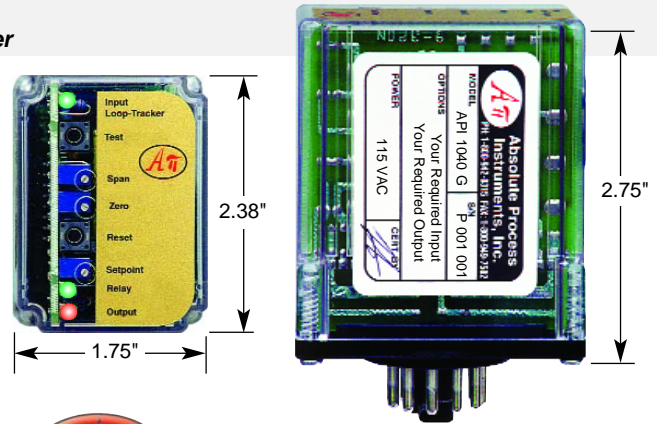
Ambient Temperature Range and Temperature Stability

-10°C to $+60^{\circ}\text{C}$ operating ambient

Better than $\pm 0.02\%$ of span per $^{\circ}\text{C}$ temperature stability

Power

Standard: 115 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.
P option: Powered by 80-265 VAC or 48-300 VDC, 50/60 Hz
A230 option: 230 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.
D option: 9-30 VDC, 2.5 W typical



Common Input Ranges			Common Outputs		
0 to 100 mV	± 100 mV	0 to 1 V	0 to 1 mA	0 to 1 V	0 to 20 mA
0 to 200 mV	± 200 mV	0 to 2 V	0 to 10 mA	0 to 5 V	4 to 20 mA
0 to 500 mV	± 500 mV	0 to 5 V	0 to 20 mA	1 to 5 V	
	± 1 V	0 to 10 V	10 to 50 mA	0 to 10 V	
	± 2 V	0 to 20 V	4 to 20 mA	± 5 V	
	± 5 V	0 to 50 V		± 10 V	
	± 10 V	0 to 100 V			

DC Input

Description and Features

The **API 1040 G** accepts a DC voltage or current input and provides a visual alarm indication and an SPDT alarm relay output when the input exceeds a high alarm trip point or falls below a low alarm trip point. The **API 1040 G** also provides a linearly-transferred DC voltage or current output. The **API 1040 G** transmitter output is useful for signal scaling, or translation from current to voltage or vice-versa in applications that do not require isolation.

This module includes an unregulated 18 VDC loop excitation supply that can be used to power an external loop-powered transmitter or other passive input device eliminating the need for an additional DC loop supply. Heavy-duty relay contacts allow the module to directly control high capacity loads.

API exclusive features include a **LoopTracker** LED that varies in intensity with changes in the process signal, alarm status LEDs for each alarm, and a **Functional Test Pushbutton** to toggle the relays independent of the input.

The **API 1040 G** provides a single setpoint adjustment and SPDT relay contacts. The alarm output can be factory configured for HI or LO operation, non-latching or latching, normal or reverse acting.

Models, Options & Accessories

Factory Configured—Specify input range, output range, and options

API 1040 G DC to DC non-isolated transmitter with alarm, 1 SPDT relay, HI alarm, normal action, non-latching, with loop power supply, 115 VAC

Options—Add to end of model number

- P** Powered by 80-265 VAC or 48-300 VDC, 50/60 Hz
- A230** Powered by 230 VAC, 50/60 Hz
- D** Powered by 9-30 VDC
- HT** Latching alarm with pushbutton reset
- HP** Latching alarm with power-off reset
- R** Reverse-acting alarms
- L** Low trip (on decreasing signal)
- SPR** Alarm set point retransmit, 0-1 VDC
- U** Conformal coating for moisture resistance

Accessories—Order as a separate line item

- API 011** 11-pin socket
- API 011 FS** 11-pin finger safe socket
- API TK36** DIN rail, 35 mm W x 39" L, aluminum



ELECTRICAL CONNECTIONS

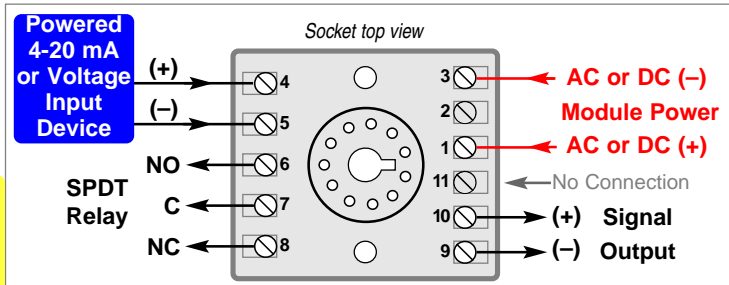
WARNING! All wiring must be performed by qualified personnel only. This module requires an industry-standard 11-pin socket. Order API 011 or finger-safe API 011 FS socket separately.

Power Input Terminals – The white label on the side of the API module will indicate the power requirements. AC power is connected to terminals 1 and 3. For DC powered modules, polarity **MUST** be observed. Positive (+) is wired to terminal 1 and negative (-) is wired to terminal 3.

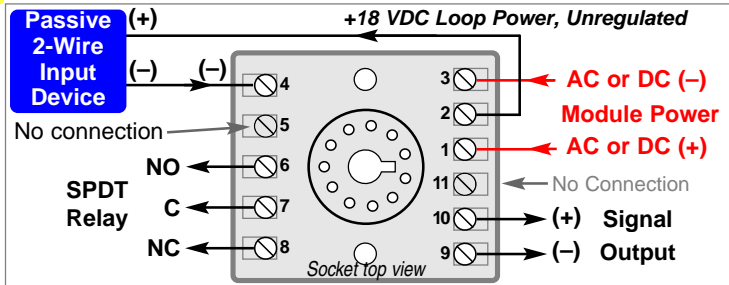
Signal Input – Polarity must be observed when connecting the signal input. The positive connection (+) is applied to terminal 4 and the negative (-) is applied to terminal 5.

Relay Output Terminals – Terminals 6, 7, 8 provide the appropriate connections for the desired relay operations. (NO = Normally Open, NC = Normally Closed, C = Common).

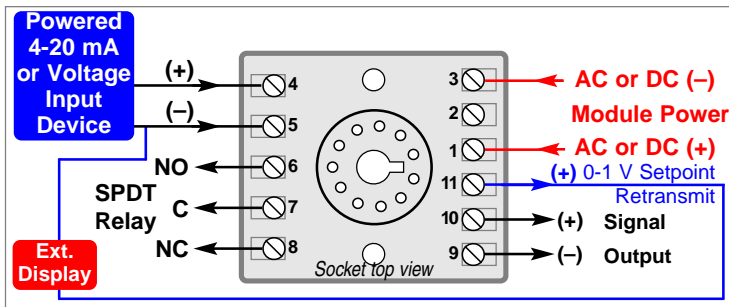
WIRING EXAMPLES



API 1040 G with Powered Current or Voltage Input



API 1040 G Using +18V Loop Power Supply



API 1040 G SPR Output Wiring Example

SETUP

The input range and alarm configuration are pre-configured at the factory as specified on your order. No input calibration is necessary.

Setpoint Control – This multi-turn potentiometer allows the operator to adjust the level at which the alarm is activated. This control is adjustable from 0 to 100% of the input range.

Deadband Control – This potentiometer allows the alarm trip and reset window to be adjusted symmetrically about the setpoint from 1 to 100% of the span. This allows the operator to fine tune the point at which the alarm trips and resets. The deadband is typically used to prevent chattering of the relays or false trips when the process signal is unstable or changes rapidly.

Test Button – The functional Test pushbutton toggles the alarm status independent of the input when depressed. It verifies the alarm and system operation without having to alter the input signal. For modules with the HT option, it also resets the latching alarm.

OPERATION

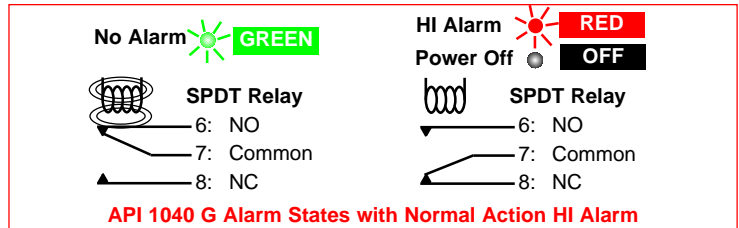
GREEN LoopTracker® Input LED – Provides a visual indication that a signal is being sensed by the input circuitry of the module. It indicates the input signal strength by changing in intensity as the process changes from minimum to maximum. If the LED fails to illuminate, or fails to change in intensity as the process changes, this may indicate a problem with module power or signal input wiring.

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 current outputs, the 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.

Bi-Color Alarm LED – Provides a visual indication of the alarm status. In all configurations, a GREEN LED indicates a non-alarm condition and a RED LED indicates an alarm condition.

Alarm Relay – In the normal mode of operation, the relay coil is energized in a non-alarm condition and de-energized in an alarm condition. This will create an alarm condition if the module loses power. For a normal acting, non-latching configuration, the alarm will activate when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then will automatically reset when the alarm condition no longer exists.

For a reverse acting alarm, the relay coil is de-energized in a non-alarm condition and energized in an alarm condition. The alarm activates when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then automatically resets when the alarm condition no longer exists.



API 1040 G HT Latching Alarm – For units with the HT latching alarm option, the Reset button is used to reset the alarm relay. The alarm relay contacts will remain in the alarmed condition until the input signal falls below the high alarm setpoint (or above low alarm setpoint, depending on configuration) and the Reset pushbutton has been pressed or power to the unit has been switched off.

API 1040 G HP Latching Alarm – For units with the HP latching alarm option, the alarm relay contacts will remain in the alarmed condition until the input signal falls below the high alarm setpoint (or above low alarm setpoint, depending on configuration) and the power to the unit has been switched off.

API 1040 G SPR Set Point Retransmission – With the SPR option, a transmitted signal (0-1 VDC) indicates the value of the alarm setpoint.

CALIBRATION

The unit comes from the factory calibrated to customer specifications. However, the top-mounted zero, span, and setpoint controls allow recalibration of the unit if required. Calibration requires an accurate signal source and measuring equipment, such as an accurate digital voltmeter.

Set the signal source to the minimum desired input. Adjust the zero control for the minimum desired output. Set the signal source to the maximum desired input, adjust the span control for the maximum desired output. Repeat steps if necessary.

To calibrate the alarm section, set the deadband control to the minimum. Set the signal source to a reference that represents the desired trip point. Adjust the setpoint control to the point at which the relay changes state from a non-alarm to an alarm condition. The deadband will be 1.0% of span in this case.

If a larger amount of deadband is desired, the deadband control may be increased by turning the control clockwise. The deadband is symmetrical about the setpoint; both transition points will change as deadband is increased. Also, the test button can be used at any time to toggle the relay state independent of the input and the output to verify system operation.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.