Frequency to DC Transmitter/Isolator

API 7010 G

Input: ***0-25 Hz to 0-20 kHz***

Output: ***0-1 V to ±10 VDC or 0-1 mA to 4-20 mA***

- ***Precision Frequency to DC Converter***
- ***Input and Output LoopTracker® LEDs***
- ***Full 2000 VRMS Input/Output/Power Isolation***
- ***Functional Test Pushbutton***

Applications

- **Monitor and Control Motor or Line Speed**
- **Convert a Square Wave Output to 4-20 mA**
- **Simplify Interfacing of Frequency Type Devices**

Specifications

Input Range

Factory Configured—Please specify input range

	Minimum	Maximum
Frequency:	0-25 Hz	0-20 kHz
Voltage:	100 mV_{RMS}	150 V_{RMS}

Input Waveform

Sine wave
Sawtooth
Square wave

Most other waveforms with greater than 100 mV amplitude change

Input Impedance

100 kΩ minimum

Input Protection

Normal mode: 200% of input rating
Common mode: 600 VDC or 600 VAC_p input to ground
System voltages must not exceed socket voltage rating

Input Loop Power Supply

18 VDC nominal, unregulated, 25 mADC
Maximum 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

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

Consult factory for other ranges

Output Linearity

Better than ±0.1% of span

Response Time

70 milliseconds typical

Output Zero and Span

Multiturn potentiometers to compensate for load and lead variations. ±15% of span adjustment range typical.

Functional Test Button

Sets output to test level when pressed.
Factory set to approximately 50% of span

Isolation

2000 V_{RMS} minimum
Full isolation: power to input, power to output, input to output

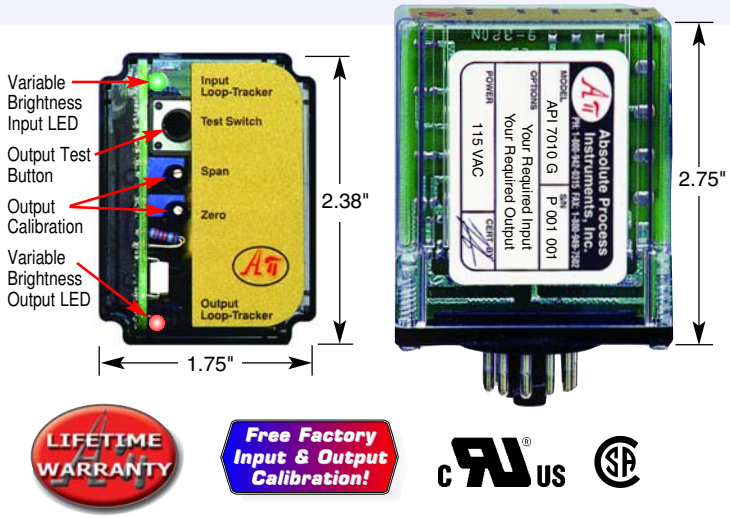
Ambient Temperature Range and Temperature Stability

–10°C to +60°C operating ambient
Better than ±0.02% of span per °C stability

Power

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

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LIFETIME WARRANTY

Free Factory Input & Output Calibration!

Description and Features

The **API 7010 G** accepts a frequency input and provides an optically isolated DC voltage or current analog output that is linearly proportional to the input. The full 3-way (input, output, power) isolation between input and output makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

Common applications include frequency to DC conversions from frequency output type devices such as rotary encoders, magnetic pick-ups, variable speed drives and flow meters. For PLCs that do not have analog outputs, often the pulse rate of a discreet output can be programmed to vary. By connecting the **API 7010 G** to this output, a proportional analog signal can be generated.

API exclusive features include two **LoopTracker** LEDs and a **Functional Test Pushbutton**. The LoopTracker LEDs (Green for input, Red for output) vary in intensity with changes in the process input and output signals. Monitoring the state of these LEDs can provide a quick visual picture of your process at all times. The functional test pushbutton provides a fixed output (independent of the input) when held depressed. The test output level is fixed at 50% of output span. Both the LoopTracker LEDs and functional test pushbutton greatly aid in saving time during initial startup and/or troubleshooting.

Also standard on the **API 7010 G** is an 18 VDC unregulated loop excitation supply. This supply can be used to power passive input devices, often eliminating the need for an additional external power supply.

The **API 7010 G** 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.

Models & Options

Factory Configured—Please specify input and output ranges

API 7010 G	Frequency to DC transmitter, isolated, with loop power supply, 115 VAC

Options—Add to end of model number

A230	Powered by 230 VAC, 50/60 Hz
D	Powered by 9-30 VDC
HC	High current output, >20 mA to 50 mADC
EXTSUP	Open collector output when a “sinking” output is required
U	Conformal coating for moisture resistance

Accessories—Order as a separate line item

API 008	8-pin socket
API 008 FS	8-pin finger safe socket
API TK36	DIN rail, 35 mm W x 39" L, aluminum

MOD-TRONIC INSTRUMENTS LIMITED
1 Delta Park Blvd #12
Brampton, ON L6T 5G1
905-457-6322 or 800-794-5883
www.mod-tronic.com

RANGES

The input and output ranges are pre-configured at the factory as specified on your order. No input calibration is necessary. Consult factory for other available ranges or for special ranges.

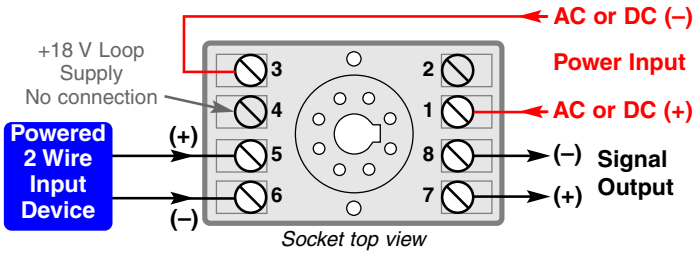
When a current output is ordered, it provides power to the output current loop (sourcing). If an unpowered (sinking) current output is required, order the API 7010 G EXTSUP with open collector output.

ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by qualified personnel only. This module requires an industry-standard 8-pin socket. Order API 008 or finger-safe API 008 FS socket.

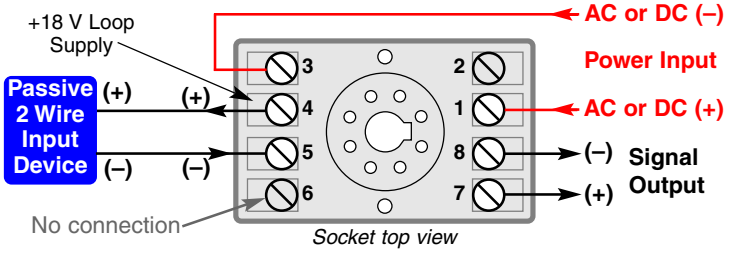
Power Input Terminals – The white label on the side of the API module will indicate the power requirements. AC power is connected to terminals 1 and 3. For DC powered modules, polarity **MUST** be observed. Positive (+) is wired to terminal 1 and negative (–) is wired to terminal 3.

Powered Signal Input – Polarity must be observed when connecting the signal input. The positive connection (+) is applied to terminal 5 and the negative (–) is applied to terminal 6.



Connecting an input device which provides power to the input circuit

Passive Signal Input – Polarity must be observed when connecting the signal input. A passive input device can be powered by the 18 volt DC power supply at terminal 4. This may save the expense of purchasing a separate power supply for the input device. A typical example is shown, however it is very important to consult the manufacturer of your specific sensor to determine its compatibility and proper wiring.



Using the built-in 18 VDC loop supply to power a passive input device

Signal Output Terminals – 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. When a current output is ordered, it provides power to the output current loop (sourcing). If an unpowered (sinking) current output is required, order the API 7010 G EXTSUP with open collector output.

TEST BUTTON

The Test Switch pushbutton may be used to 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. This test signal is factory set to approximately 50% of the calibrated output range. When the button is released, the output will return to normal.

Example: If you are checking a 4-20 mA current loop, when the pushbutton is held depressed, the output from the module will be approximately 12 mA.

OPERATION

The frequency input to the API 7010 G is filtered to remove unwanted noise, converted to a DC voltage, and then passed through an opto-coupler to the output stage.

The frequency input can be virtually any type of signal (sine wave, sawtooth, square wave, etc.) as long as there is a sufficient change in amplitude (greater than 100mV).

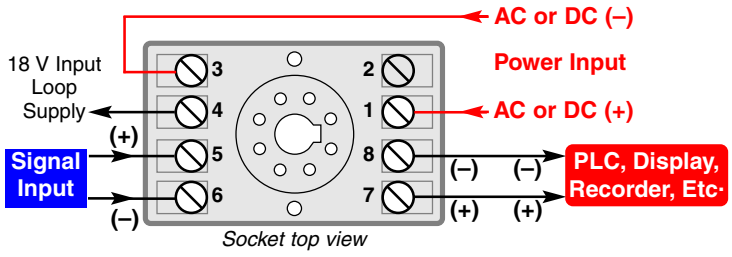
GREEN *LoopTracker*® Input LED – Provides a visual indication that a signal is being sensed by the input circuitry of the module. It also indicates the input signal strength by changing in intensity as the process changes from minimum to maximum. If the LED fails to illuminate, or fails to change in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

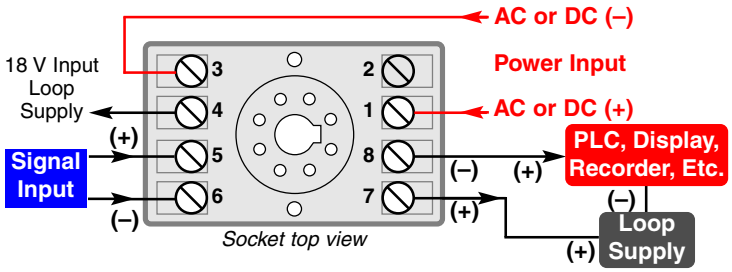
CALIBRATION

Input and output ranges are pre-configured at the factory as specified on your order. Top-mounted, Zero and Span potentiometers can be used should fine-tuning be necessary. Custom ranges may require factory modification.

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 signal, 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 signal, the Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for maximum accuracy.



API 7010 G typical output wiring



API 7010 G EXTSUP typical output wiring

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