

DC to Frequency Transmitters, Isolated, Field Rangeable

API 7500 G, API 7500 G SS 

Input: 0-50 mV to ± 10 VDC, 0-1 mA to 4-20 mA

Output: 0-1 Hz to 0-30 kHz MOSFET or TTL

- 24 Selectable Inputs and 30 Selectable Outputs
- Setup via Rotary Switches & Easy-to-Use Tables
- 2000 V Full Isolation Input/Output/Power
- Adjustable Low Frequency Cutout
- Input and Output LoopTracker® LEDs
- Functional Test Push Button

Applications

- Analog to Frequency for Totalizers and Counters
- Use With API 7580 for Remote Monitoring

DC Input Ranges

Voltage: 0-50 mVDC to ± 10 VDC

Current: 0-1 mA to 0-20 mA including 4-20 mA
mA input may be wired for sink or source

Consult factory for other ranges

System voltages must not exceed socket voltage rating

Input Impedance

Voltage: 1 M Ω minimum

Current: 50 Ω typical

Input Loop Power Supply

18 VDC nom., unregulated, 25 mA, max. ripple, <1.5 V_{p-p}

LoopTracker

Variable brightness LEDs indicate I/O loop level and status

Frequency Output Ranges

	Minimum	Maximum	Increments
Low range:	0-100 Hz	0-1500 Hz	100 Hz
High range:	0-2 kHz	0-30 kHz	2 kHz

Frequency Output Ranges, SS Version

	Minimum	Maximum	Increments
SS low range:	0-1 Hz	0-15 Hz	1 Hz
SS high range:	0-20 Hz	0-300 Hz	20 Hz

Output Waveform and Type

Square wave

Normal acting, output freq. increases with increasing input

Output Driver

MOSFET output, open drain, 24 VDC maximum

I_{sink} 50 mA maximum

V_{on} 0.6 V maximum at 50 mA I_{sink}

M02 option: TTL output 1 V_{p-p} to 12 V_{p-p} depending on load

Cutout Control

Disables output when input falls below preset level

Adjustable from 2% to 25% of range

Top accessible, multi-turn potentiometer

Output Calibration

Multi-turn zero and span potentiometers

$\pm 15\%$ of selected span typical

Output Test

Pressing top button sets output to test level

Potentiometer adjustable 2-100% of span

Linearity

Better than $\pm 0.4\%$ of span

Ambient Temperature Range and Stability

-10°C to +60°C operating ambient

Better than $\pm 0.02\%$ of span per °C stability

Response Time

70 milliseconds typical

Consult factory for faster response times

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

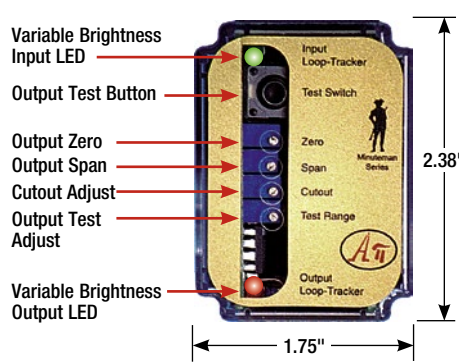
Power

Standard: 115 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.

A230 option: 230 VAC $\pm 10\%$, 50/60 Hz, 2.5 W max.

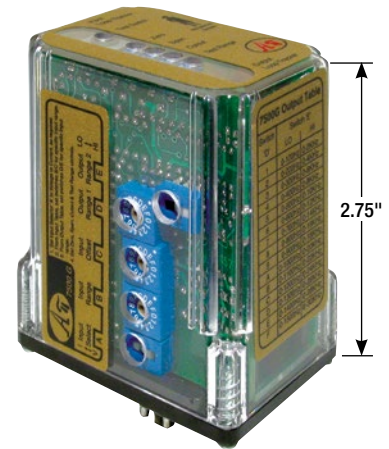
P option: 85-265 VAC 50/60 Hz, 60-300 VDC 2.5 W typ.

D option: 9-30 VDC, 1.5 W typical



Quick Link
api-usa.com/7500

Hot Swappable
Plug-In Design



UL®
E145968
115 VAC, 230 VAC
models





Free Factory
I/O Setup!

Description

The API 7500 G accepts a DC voltage or current input and provides an optically isolated frequency output that is directly proportional to the input. Common applications include pulse counting or totalizing of DC process signals from devices such as flow transmitters, analog signal transmission over long distances, or analog inputs into PLCs. The full 3-way (input, output, power) isolation makes this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.

A low frequency cutout potentiometer can be adjusted to disable the output when the input falls below a pre-determined level. The API 7500 G can be field-configured via external rotary and slide switches. Common ranges are on the module label, however, virtually unlimited combinations are possible.

The API 7500 G has an open drain MOSFET (open collector) output which requires a user supplied external power supply and pull-up resistor allowing the module to be interfaced with a wide variety of devices. For a TTL powered output, order the M02 option.

Model	Input	Output	Power
API 7500 G	Field rangeable voltage or milliamps 0-50 mVDC to ± 10 VDC 0-1 mA to 0-20 mA	Field rangeable 0-100 Hz to 0-30 kHz	115 VAC 
API 7500 G A230			230 VAC 
API 7500 G P			85-265 VAC or 60-300 VDC
API 7500 G D		Field rangeable Low range version 0-1 Hz to 0-300 Hz	9-30 VDC
API 7500 G SS			115 VAC 
API 7500 G SS A230			230 VAC 
API 7500 G SS P			85-265 VAC or 60-300 VDC
API 7500 G SS D			9-30 VDC

Options—add to end of model number

M02 TTL powered output instead of MOSFET output

M03 Adjustable signal generator, no input

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.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. See api-usa.com for latest product information. Consult factory for your specific requirements.



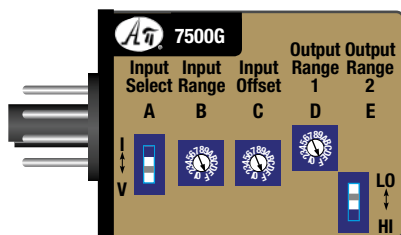
WARNING: This product can expose you to chemicals including lead and nickel, which are known to the State of California to cause cancer or birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

I/O Range Switch Settings

It is easier to select ranges before installation. Ranges are listed below and the module side label lists common ranges. See the model/serial number label for module options, or if a custom range was specified.

Three rotary switches and two slide switches located on the side of the module are used to select input and output ranges. For ranges that fall between the listed ranges use the next highest setting and trim the output signal with the zero and span potentiometers.

1. Set slide switch A to current "I" or voltage "V" depending on input type. The input selector switch determines the input impedance for the module, typically 50 Ω for current inputs and 1 M Ω or greater for voltage.
2. From the table, find the rotary switch settings that match your input range and set Input B and Offset C.
3. From the table, find your frequency output range and set slide switch E to HI or LO to match your frequency output range.
4. From the table, find your frequency output range and set rotary switch D to match your frequency output range.



Electrical Connections

Polarity must be observed for input and output wiring connections. If the input and/or output do not function, check wiring polarity.

Socket and Mounting

This module requires installation in 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.

Input Wiring

See the wiring diagrams. Polarity must be observed when connecting the signal input. The API 7500 G input can be wired to provide power to drive a current loop. It can also be wired to a device that provides loop power.

Determine if your device provides power to the current loop or if the loop must be powered by the API module. Use a multi-meter to check for voltage at your device's output terminals. Typical voltage may be 9-24 VDC if it provides power to the loop.

mV Input	ABC	Volt Input	ABC	mA Input	ABC
0-50 mV	V80	0-1 V	V10	0-1 mA	I00
0-100 mV	V90	0-2 V	V20	0-2 mA	I00
0-200 mV	VA0	0-2.5 V	V40	0-4 mA	I10
0-250 mV	VC0	0-4 V	V30	0-8 mA	I20
0-400 mV	V80	1-5 V	V30	2-10 mA	I20
0-500 mV	V00	0-5 V	V50	0-10 mA	I40
		0-10 V	V60	0-16 mA	I30
		±5 V	V64	0-20 mA	I50
		±10 V	V74	4-20 mA	I30

Standard 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.

The standard API 7500 G has an open drain MOSFET (open collector) output. This output requires a user-supplied external power supply and pull-up resistor unless your input device is compatible with this type of output. The output signal is protected to a maximum of 24 V. See wiring diagram below.

API 7500 G Output LO	DE	API 7500 G Output HI	DE
0-100 Hz	1 L	0-2 kHz	1 H
0-200 Hz	2 L	0-4 kHz	2 H
0-300 Hz	3 L	0-6 kHz	3 H
0-400 Hz	4 L	0-8 kHz	4 H
0-500 Hz	5 L	0-10 kHz	5 H
0-600 Hz	6 L	0-12 kHz	6 H
0-700 Hz	7 L	0-14 kHz	7 H
0-800 Hz	8 L	0-16 kHz	8 H
0-900 Hz	9 L	0-18 kHz	9 H
0-1000 Hz	AL	0-20 kHz	AH
0-1100 Hz	BL	0-22 kHz	BH
0-1200 Hz	CL	0-24 kHz	CH
0-1300 Hz	DL	0-26 kHz	DH
0-1400 Hz	EL	0-28 kHz	EH
0-1500 Hz	FL	0-30 kHz	FH

API 7500 G SS Output LO	DE	API 7500 G SS Output HI	DE
0-1 Hz	1 L	0-20 Hz	1 H
0-2 Hz	2 L	0-40 Hz	2 H
0-3 Hz	3 L	0-60 Hz	3 H
0-4 Hz	4 L	0-80 Hz	4 H
0-5 Hz	5 L	0-100 Hz	5 H
0-6 Hz	6 L	0-120 Hz	6 H
0-7 Hz	7 L	0-140 Hz	7 H
0-8 Hz	8 L	0-160 Hz	8 H
0-9 Hz	9 L	0-180 Hz	9 H
0-10 Hz	AL	0-200 Hz	AH
0-11 Hz	BL	0-220 Hz	BH
0-12 Hz	CL	0-240 Hz	CH
0-13 Hz	DL	0-260 Hz	DH
0-14 Hz	EL	0-280 Hz	EH
0-15 Hz	FL	0-300 Hz	FH

M02 Option TTL Output

The M02 TTL output option uses an internal power supply and an internal pull up resistor. An external power supply is not needed. The output amplitude can vary from 1 VDC to 12 VDC depending on the input impedance of your device. Maximum current drive capability is 10 mA.

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 and negative (-) is wired to terminal 3.

Output Calibration

Top-mounted zero and span potentiometers can be used should fine-tuning be necessary.

Note: Perform the following calibration procedure any time switch settings are changed.

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 frequency 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 of 0 Hz.
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.
5. Repeat adjustments for maximum accuracy.

Cutout Control

This multi-turn potentiometer provides the user with a low threshold adjustment. It disables output when input falls below a preset level. The low cutout potentiometer is adjustable from 2% to 25% of input range. The input signal must overcome this setting to produce an output from the unit.

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. Additionally external contacts across terminals 5 and 6 can be used as a remote test function or manual over ride.

The Test Cal. potentiometer is factory set to approximately 50% output. It can be adjusted to set the test output from 2 to 100% of the output span. Press and hold the Test button and adjust the Test Cal. potentiometer for the desired output level.

Operation

The API 7500 G accepts a DC voltage or current input and provides an optically isolated frequency output that is linearly related to the input. Note the output duty cycle decreases as the frequency increases in the high ranges.

The variable brightness green LoopTracker[®] input LED provides a visual indication of the input level. It changes in intensity as the input changes from minimum to maximum. If the LED fails to illuminate, or change in intensity as the input changes, it may indicate a problem with 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 frequency signal is functioning. It becomes brighter as the input and the corresponding output change from minimum to maximum.

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.

