

**2 Inputs:** mVDC, ±10 to 0-10 VDC, 0-1 mA to 4-20 mA  
**2 Outputs:** 0-5 V, 0-10 V, ±5 V, ±10 V, 0-20 mA, 4-20 mA

- 2 Independent Channels in a 55 mm Package
- 2000 V Power/Input/Output/Channel Isolation
- Full Isolation Eliminates Ground Loops
- Input and Output LoopTracker® LEDs
- Functional Test Button for Each Channel
- Independent Zero and Span for Each Channel



Free Factory I/O Setup!

Quick Link  
[api-usa.com/4390](http://api-usa.com/4390)



Removable Plugs

### Applications

- Isolate, Convert, Boost, Rescale Process Signals
- One Model to Interface Two Process Signals with Panel Meters, Recorders, Data Acquisition Cards, PLCs, DCS Systems, SCADA Systems

### Input Ranges

Factory configured—specify an input for each channel  
 Voltage: 0-100 mVDC, 0-5 VDC, 0-10 VDC, 0-100 VDC, ±5 VDC, ±10 VDC  
 Current: 0-1 mA, 0-20 mA, 4-20 mA;  
 see sinking or sourcing options  
 Consult factory for special ranges

### Input Characteristics

Voltage: 200 kΩ minimum input impedance per channel  
 Current: 1.25 VDC maximum voltage burden per channel

### Input Loop Supply for L1 Versions

15 VDC nominal, regulated, 25 mA

### LoopTracker

Variable brightness LEDs indicate I/O loop level and status

### Output Ranges

Factory configured—specify an output for each channel  
 Voltage: 0-100 mV, 0-5 VDC, 0-10 VDC, ±5 VDC, ±10 VDC  
 Current: 0-20 mA, 4-20 mA  
 both mA output channels are sourced  
 Consult factory for special ranges

### Output Drive for Sourcing Output

1000 Ω at 20 VDC typical

### Output Zero and Span

Multi-turn zero and span potentiometers for each channel to compensate for load and lead variations.  
 ±15% of span adjustment range typical  
 Ultra-low interaction zero and span, <0.001 ppt

### Output Linearity

Better than ±0.1% of span

### Output Ripple and Noise

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

### Functional Test Buttons

Sets output to approximately 50% of span when pressed  
 One button per channel

### Response Time

70 milliseconds typical  
 Consult factory for optional response times

### Isolation

2000 V<sub>RMS</sub> minimum  
 Full isolation: power to each channel, each input to each output, each channel to each channel

### Common Mode Rejection

120 dB minimum

### Ambient Temperature Range and Stability

-10°C to +60°C operating ambient  
 Better than ±0.04% of span per °C stability

### Housing

Polycarbonate UL #94V-1 housing and UL #94V-2 terminals  
 35 mm DIN rail or surface mount

### Power

Both input power supplies are fuse protected  
 80-265 VAC or 40-300 VDC, 50/60 Hz, 5 W max., 4 linear type  
 DD: 9-30 VDC or 10-32 VAC, 5 W max., 4 switching type

### Dimensions

2.17" W x 3.0" H x 4.33" D (not including connectors)

### Description

The API 4390 DIN, API 4391 DIN and API 4392 DIN accept two analog DC voltage or current inputs and provide two optically isolated analog DC voltage or current outputs that are linearly related to the inputs. The two independent channels provide an economical signal conversion solution where space is limited.

For each channel the input signal is filtered, either amplified or attenuated as required, then passed through an opto-coupler to the output stage. The optical isolation between the inputs and outputs make this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

Applications include signal isolation, signal scaling, signal conversion, signal boosting or a combination of the four. This product is designed to function effectively in electrically noisy industrial environments.

### How to Order

#### All models are factory ranged

API 4390 DIN 4-20 mA version sink and source options L and EX options can be combined. See 4390 table below.

Each input and output can be different.

Normal operating power is 80-265 VAC or 40-300 VDC.

Use DD option for low voltage operation

### LoopTracker

API exclusive features include two LoopTracker LEDs for each channel. The LoopTracker LEDs (green for input, red for output) vary in intensity with changes in the process input and output signals and can provide a quick visual picture of your process loop at all times.

### Functional Test

An API exclusive feature includes a Functional Test Button for each channel. The functional test button provides a fixed output (independent of the input) when held depressed. This output is factory set to approximately 50% of the output span.

Both the LoopTracker LEDs and functional test button greatly aid in saving time during initial startup and/or troubleshooting.

### Please specify

Model number with L and EX options if required

Input range channel 1

Output range channel 1

Input range channel 2

Output range channel 2

Options as required

Model	Input 1	Input 2	Output 1	Output 2
API 4390 DIN	VDC or sinking mA	VDC or sinking mA	VDC or sourcing mA	VDC or sourcing mA
API 4390 DIN EX1	VDC or sinking mA	VDC or sinking mA	Sinking mA	VDC or sourcing mA
API 4390 DIN EX2	VDC or sinking mA	VDC or sinking mA	VDC or sourcing mA	Sinking mA
API 4390 DIN EX3	VDC or sinking mA	VDC or sinking mA	Sinking mA	Sinking mA
API 4390 DIN L1	Sourcing mA	VDC or sinking mA	VDC or sourcing mA	VDC or sourcing mA
API 4390 DIN L1 EX1	Sourcing mA	VDC or sinking mA	Sinking mA	VDC or sourcing mA
API 4390 DIN L1 EX2	Sourcing mA	VDC or sinking mA	VDC or sourcing mA	Sinking mA
API 4390 DIN L1 EX3	Sourcing mA	VDC or sinking mA	Sinking mA	Sinking mA
API 4390 DIN L2	VDC or sinking mA	Sourcing mA	VDC or sourcing mA	VDC or sourcing mA
API 4390 DIN L2 EX1	VDC or sinking mA	Sourcing mA	Sinking mA	VDC or sourcing mA
API 4390 DIN L2 EX2	VDC or sinking mA	Sourcing mA	VDC or sourcing mA	Sinking mA
API 4390 DIN L2 EX3	VDC or sinking mA	Sourcing mA	Sinking mA	Sinking mA
API 4390 DIN L3	Sourcing mA	Sourcing mA	VDC or sourcing mA	VDC or sourcing mA
API 4390 DIN L3 EX1	Sourcing mA	Sourcing mA	Sinking mA	VDC or sourcing mA
API 4390 DIN L3 EX2	Sourcing mA	Sourcing mA	VDC or sourcing mA	Sinking mA
API 4390 DIN L3 EX3	Sourcing mA	Sourcing mA	Sinking mA	Sinking mA
Model	Input 1	Input 2	Output 1	Output 2
API 4391 DIN	VDC or sinking mA	VDC or sinking mA	±VDC	±VDC
API 4392 DIN	±VDC or ±mADC	±VDC or ±mADC	±VDC or sourcing mA	±VDC or sourcing mA

### Options—add to end of model number

- DD** Powered by 9-30 VDC or 10-32 VAC  
 Use DD instead of DIN in model number
- DF** Fast response time, consult factory
- U** Conformal coating for moisture resistance

### Accessories—order as separate line item

- API TK36** DIN rail, 35 mm W x 39" L, aluminum
- API GP8** Spare removable plug, green



## Electrical Connections

**WARNING!** All wiring must be performed by a qualified electrician or instrumentation engineer. See wiring examples below or consult factory for assistance.

The housing can be clipped to a standard 35 mm DIN rail or surface mounted. Each product is factory configured to your exact input and output requirements as indicated on the product label. The power supplies are fuse protected and the unit may be returned to API for fuse replacement.

## Module Power Terminals

The white label on the side of the API module will indicate the power requirements. Power is connected to terminals 12 and 13.

## Signal Input Terminals

Polarity must be observed when connecting the signal input.

The positive connection (+) for channel 1 is applied to terminal 9 and the negative (-) is applied to terminal 10.

The positive connection (+) for channel 2 is applied to terminal 15 and the negative (-) is applied to terminal 16.

## Signal Output Terminals

Polarity must be observed when connecting the signal output to the load.

The positive connection (+) for channel 1 is connected to terminal 6 and the negative (-) is connected to terminal 7.

The positive connection (+) for channel 2 is connected to terminal 3 and the negative (-) is connected to terminal 2.

## Calibration

Front-mounted Zero and Span potentiometers for each channel can be used to compensate for load and lead variations.

1. Apply power to the module and allow a minimum 30 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.
6. Repeat adjustments for second channel.

## Test Function

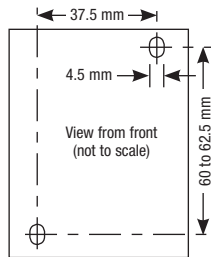
The functional test buttons are factory set to provide approximately 50% output. When depressed they will drive the output side of the loop with a known good signal that can be used as a diagnostic aid during initial start-up or troubleshooting. When released, the output will return to normal.

## Operation

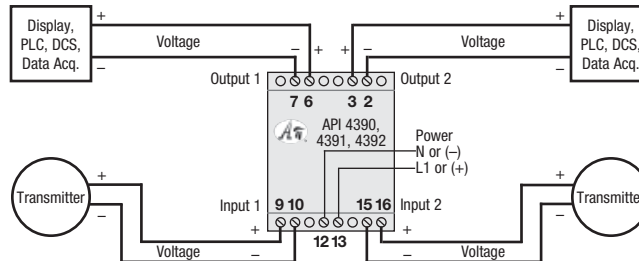
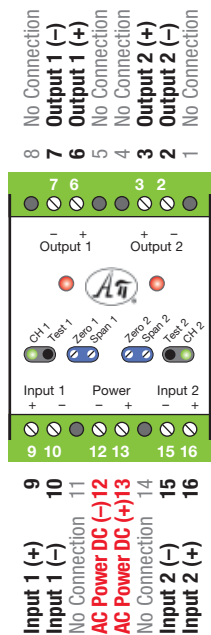
The green LoopTracker® input LED provides a visual indication that a signal is being sensed by the input circuitry of the module. It also indicates the input signal strength by changing in intensity as the process changes from minimum to maximum. If the LED fails to illuminate, or fails to change in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

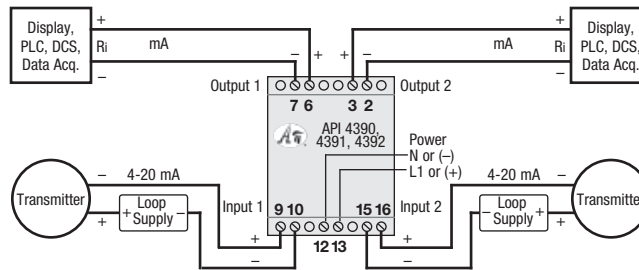
For current outputs, the red LED will only light if the output loop current path is complete. For either current or voltage outputs, failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module power or signal output wiring.



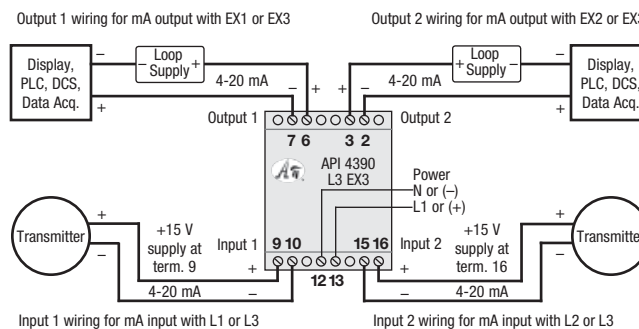
Surface mounting dimensions



API 4390, 4391, 4392 with Voltage Inputs and Outputs



API 4390, 4391, 4392 with Current Inputs and Outputs  
Both mA inputs sink current. Both mA outputs source current.



API 4390 Current Input and Output Sink/Source Options  
L and EX options may be combined, such as API 4390 DIN L1 EX2

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