2 Channel DC to DC Isolator Transmitters

API 4390 DIN, API 4391 DIN API 4392 DIN

DC Input

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 Pushbutton for Each Channel***
- ***Independent Zero and Span for Each Channel***



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**

Specifications

Input Ranges

Factory Configured—Specify an input for each channel
Voltage: ±5 VDC, ±10 VDC, 0-100 mVDC, 0-5 VDC, 0-10 VDC, 0-100 VDC
Current: 0-1 mADC, 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

LoopTracker

Variable brightness LEDs indicate input/output loop level and status

Output Ranges

Factory Configured—Please 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 output channels are sourced
Consult factory for special ranges

Output Zero and Span

Multiturn 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_{RMS}

Functional Test Buttons

Sets output to test level when pressed. One button per channel.
Factory set to approximately 50% of span

Response Time

70 milliseconds typical. Consult factory for optional response times.

Isolation

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

Common Mode Rejection

120 dB minimum

Ambient Temperature Range and Temperature Stability

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

Case Material

Polycarbonate: gray UL #94V-1 housing and black UL #94V-2 terminals

Power

Both input power supplies are fuse protected and all are fully isolated
Standard: 115 VAC ±10%, 50/60 Hz, 5 W max., four linear type
A230 option: 230 VAC ±10%, 50/60 Hz, 5 W max., four linear type
D option: 9-30 VAC/VDC, 5 W max., four switching type

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Description and Features

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. 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. The two independent channels provide an economical signal conversion solution where space is limited. This product is designed to function effectively in electrically noisy industrial environments.

API exclusive features include two ***LoopTracker*** LEDs and **Functional Test Pushbuttons** 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.

The functional test pushbutton 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 pushbutton greatly aid in saving time during initial startup and/or troubleshooting. The modules clip to an industry standard 35 mm DIN rail or they can be surface mounted.

Models & Options

Specify input and output ranges for each channel and options

Model	Power	Inputs	Outputs
API 4390 DIN	115 VAC	VDC, mADC	VDC, mADC
API 4391 DIN	115 VAC	VDC, mADC	±5, ±10 VDC
API 4392 DIN	115 VAC	±VDC, ±mADC	±VDC, mADC

Options–Add to end of model number

A230	Powered by 230 VAC, 50/60 Hz
D	Powered by 9-30 VAC/VDC
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

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

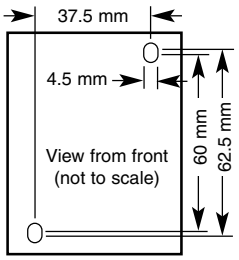
API 4390 DIN, API 4391 DIN API 4392 DIN

Installation and Setup

ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by a qualified electrician or instrumentation engineer. See wiring examples at right 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.

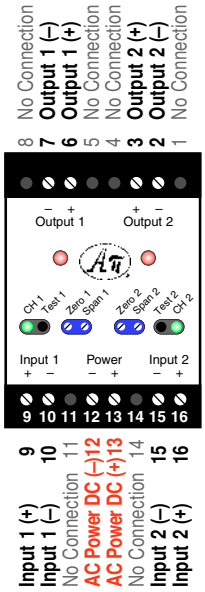


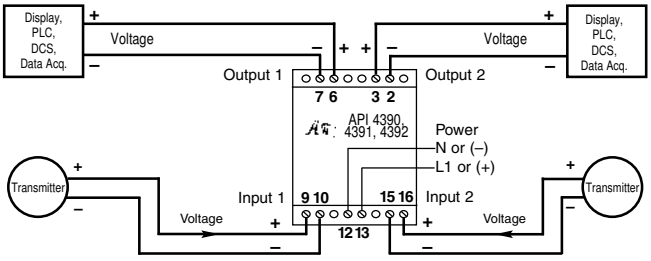
Surface mounting dimensions

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

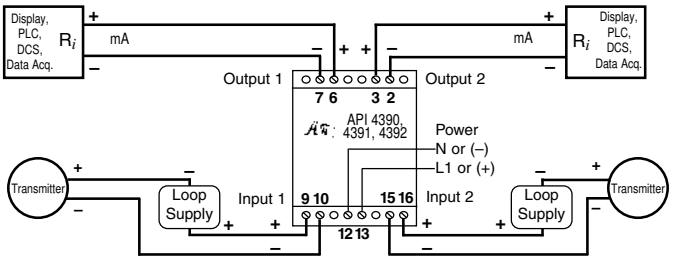
Signal Input Terminals – Polarity must be observed when connecting the signal input. The positive connection (+) for channel 1 is applied to terminal 9 and the negative (–) is applied to terminal 10. The positive connection (+) for channel 2 is applied to terminal 16 and the negative (–) is applied to terminal 15.

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.





Voltage Inputs and Outputs



Current Inputs and Outputs
Both API inputs sink current. Both API outputs source current.

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 BUTTONS

The Test pushbuttons 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

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.

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.

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

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