

**1 Input:** One 350 Ω Sensor, 1 mV to 2000 mV, 4-10 VDC Excitation  
**2 Outputs:** 0-1 V to 0-10 V, ±1 V to ±10 V, 0-1 mA to 20 mA, 4-20 mA

**Quick Link:** [api-usa.com/5393](http://api-usa.com/5393)

- One Input to Two Outputs with Full Isolation
- Zero and Span for Each Output
- Full 1200 V Input/Output /Power Isolation
- Input and Output LoopTracker® LEDs
- Output Test Button for Each Channel
- Built-In Loop Power Supplies for Sink/Source I/O

**Applications**

- Split, Convert, Boost, and Rescale Process Signals
- Split Process Signals for Control and Validation
- Interface a Process Signal with Multiple Panel Meters, PLCs, Recorders, Data Acq., DCS, & SCADA Systems

**Bridge/Load Cell Input Range**

Factory configured, please specify sensor mV/V and mV range  
 Minimum sensor range 0-1 mV  
 Maximum sensor range: 0-2000 mV  
 Millivolt output range is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied.  
 mV/V sensitivity X excitation voltage = total mV range

**Input Impedance**

1 MΩ minimum

**Input Protection, Common Mode**

100 dB minimum

**Excitation Voltage**

Range: 4 to 10 VDC factory set, please specify  
 Adjustment: ±10% via front potentiometer  
 Maximum output: 10 VDC maximum at 30 mA  
 Stability: ±0.01% per °C  
 Designed for one 350 Ω (or greater) sensor

**LoopTracker**

Variable brightness LEDs indicate I/O loop level and status  
 One for input, one for each output

**Channel 1 and Channel 2 DC Output Ranges**

Factory configured, please specify for each output channel  
 Voltage: 0-1 VDC to 0-10 VDC, 10 mA max  
 up to 20 VDC with M19, M29, M39  
 Bipolar voltage: ±1 VDC to ±10 VDC  
 Current: 0-1 mA to 20 mA, 4-20 mA  
 20 V compliance, 1000 Ω at 20 mA

**Output Loop Power Supplies**

20 VDC nominal, regulated, 25 mA for each output channel  
 May be selectively wired for sinking or sourcing mA output

**Output Calibration**

Multi-turn zero and span potentiometers for each output channel  
 ±15% of span adjustment range typical

**Output Test/Override**

Front momentary buttons or external contact closures for each channel to set output test levels.  
 Each output test level potentiometer adjustable 0-100% of span

**Output Ripple and Noise**

Less than 10 mVRMS

**Linearity**

Better than ±0.1% of span

**Ambient Temperature Range and Stability**

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

**Response Time**

70 milliseconds typical  
 Fast response time option DF, 10 milliseconds typical

**Isolation**

Full 4-way, 1200 VRMS minimum

**Power**

85-265 VAC, 50/60 Hz or 60-300 VDC, 6 W maximum  
 D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 6 W maximum

**Housing and Connectors**

IP 40, requires installation in panel or enclosure  
 For use in Pollution Degree 2 Environment  
 Mount vertically to a 35 mm DIN rail  
 Eight 4-terminal removable connectors, 14 AWG max wire size



**Applications Link**  
[api-usa.com/apps](http://api-usa.com/apps)

**Free Factory I/O Setup!**

**Dimensions**  
 1.78" W x 4.62" H x 4.81" D  
 45 mm W x 117 mm H x 122 mm D  
 Height includes connectors

**Description**

The APD 5393 IsoSplitter accepts a strain gauge, bridge, or load cell input and provides two optically isolated DC voltage or current outputs that are linearly related to the input. The input range and each output range are independent and can be specified as required. This provides an economical solution when one signal must be sent to two different devices.

Typical applications include isolation, output splitting, output device separation and redundancy (i.e. to prevent failure of the entire loop if one device fails), or a combination of these.

The input signal is filtered, amplified, split, and then passed through an opto-coupler to the output stages. Full 4-way isolation (input, output 1, output 2, power) make this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.

**I/O Sink/Source Versatility**

Standard on the APD 5393 is an adjustable excitation supply for the input channel and 20 VDC loop excitation supplies for each output channel. The output power supplies can be selectively wired for sinking or sourcing allowing use with any combination of powered or unpowered milliamp I/O devices.

**How to Order**

Models are factory ranged. See I/O ranges above left.  
 Please specify ranges and options on order

**Input mV range and excitation voltage**

**Channel 1 output range**  
**Channel 2 output range**

See options at right

Model	Description	Power
APD 5393	IsoSplitter 1 input to 2 outputs	85-265 VAC, 50/60 Hz or 60-300 VDC
APD 5393 D		9-30 VDC or 10-32 VAC

Sink or Source mA Output for Each Channel

Output LoopTracker LED for Each Channel

Adjustable Output Test Function for Each Channel

Zero and Span for Each Channel

Input LoopTracker LED

Custom I/O Ranges

Connect Sink or Source mA Input

Universal Power

Removable Plugs



See Wiring Diagrams on Next Page

**LoopTracker**

API exclusive features include three LoopTracker LEDs (green for input, red for each output) that vary in intensity with changes in the process input and output signals.

These provide a quick visual picture of your process loop at all times and can greatly aid in saving time during initial startup and troubleshooting.

**Output Test**

An API exclusive feature includes output test buttons for each channel to provide a fixed output (independent of the input) when held depressed. A test button is provide for each output channel. The output test greatly aids in saving time during initial startup and/or troubleshooting.

The test output level for each channel is potentiometer adjustable from 0 to 100% of the output span.

Terminals are provided to operate the test functions remotely for each channel. This also allows use as a remote manual override to provide a temporary fixed output if desired.

**Options and Accessories**

**Options—add to end of model number**

- R1** Channel 1 I/O reversal (ie. 4-20 mA in to 20-4 mA out)
- R2** Channel 2 I/O reversal (ie. 4-20 mA in to 20-4 mA out)
- R3** Channel 1 and channel 2 I/O reversal
- M19** Channel 1 high voltage output >10 V up to 20 V
- M29** Channel 2 high voltage output >10 V up to 20 V
- M39** Channel 1 and channel 2 high voltage output
- DF** Fast response time, 10 milliseconds typical  
 DF option will cause output noise levels to be greater than standard specifications.
- U** Conformal coating for moisture resistance

**Accessory—order as separate line item**

**API BP4** Spare removable 4 terminal plug, black

**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](http://api-usa.com) for latest product information. Consult factory for your specific requirements.

**WARNING:** This product can expose you to chemicals including 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](http://www.P65Warnings.ca.gov)

**Electrical Connections**

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

Each product is factory configured to your exact input and output ranges as indicated on the serial number label.

**Outputs**

For milliamp output ranges determine if your devices provide power to the current loop or if the loop must be powered by the APD module. Typical voltage may be 9-24 VDC at your device's terminals if it provides power to the loop.

Device for Output Channel 1	Terminal	Terminal
Measuring/recording device accepts a voltage input.	3 (-)	4 (+)
Measuring/recording device has an unpowered or passive mA input. APD module provides the loop power.	3 (-)	4 (+20 V)
Measuring/recording device has a mA input and powers the current loop.	2 (-)	3 (+)
Device for Output Channel 2	Terminal	Terminal
Measuring/recording device accepts a voltage input.	7 (-)	8 (+)
Measuring/recording device has an unpowered or passive mA input. APD module provides the loop power.	7 (-)	8 (+20 V)
Measuring/recording device has a mA input and powers the current loop.	6 (-)	7 (+)

**Bridge, Strain Gauge, Load Cell Input**

Refer to wiring diagram at right and strain gauge manufacturer's data sheet for wiring and color-coding. Polarity must be observed when connecting input. Sensor shield wire (if equipped) should be grounded at one end only.

The excitation voltage is factory set and should match the sensor manufacturer's recommendations. A front potentiometer allows approximately ±10% fine adjustment of the excitation voltage.

**CAUTION:** Never short the excitation leads together. This will cause internal damage to the module.

Strain Gauge Input	- Terminal	+ Terminal
Strain gauge signal input	17 (+)	19 (-)
Excitation voltage	18 (-)	20 (+)

**Module Power Terminals**

Check model/serial number label for module operating voltage to make sure it matches available power.

When using DC power, either polarity is acceptable, but for consistency, wire positive (+) to terminal 25 and negative (-) to terminal 28.

The power supplies are fuse protected and the unit may be returned to API for fuse replacement.

**Mounting to a DIN Rail**

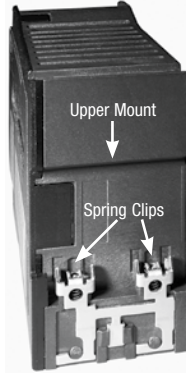
Install module vertically on a 35 mm DIN rail in a protective enclosure away from heat sources. Do not block air flow. Allow 1" (25 mm) above and below housing vents for air circulation.

1. Tilt front of module down and position the lower spring clips against the bottom edge of DIN rail.
2. Push front of module upward until upper mount snaps into place.

**Removal**

Avoid shock hazards! Turn signal input, output, and power off.

1. Push up on bottom back of module.
2. Tilt front of module downward to release upper mount from top edge of DIN rail.
3. The module can now be removed from the DIN rail.



**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 voltmeter on terminals 18 and 20 adjust the excitation voltage fine adjustment potentiometer to the desired value.
3. Using an accurate calibration 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. For example: 4 mA for a 4-20 mA output or -10 V for a ±10V output.
4. 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.
5. 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, the Span control will provide adjustment for the 20 mA or high end of the signal.
6. Repeat adjustments for both output channels for best accuracy.

**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.

Each Test Cal. potentiometer can be adjusted to set the test output from 0 to 100% of the output span. Press and hold the Test button and adjust the corresponding Test Cal. potentiometer for the desired output level.

They may optionally be externally wired for remote test operation or a manual override. See wiring diagram at right.

**Operation**

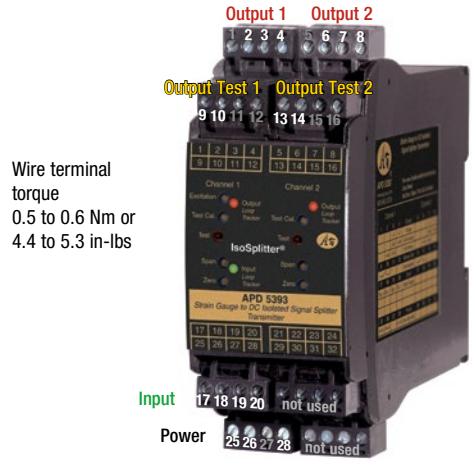
The APD 5393 IsoSplitter® accepts a strain gauge input and provides two optically isolated DC voltage or current outputs that are linearly related to the input.

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.

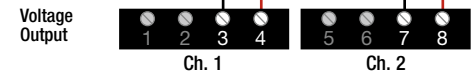
The two red LoopTracker output LEDs provide a visual indication that the output signals are functioning. They become brighter as the input and each corresponding output change from minimum to maximum.

For a current output 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. Note that it may be difficult to see the LEDs under bright lighting conditions.

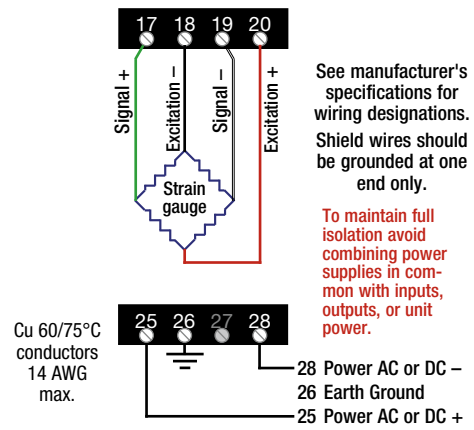
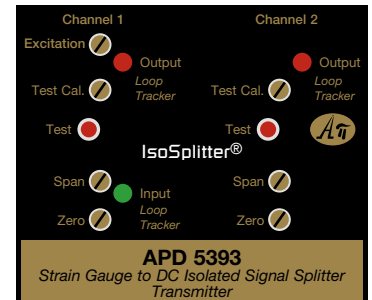
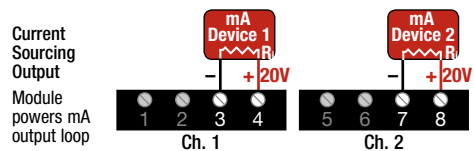
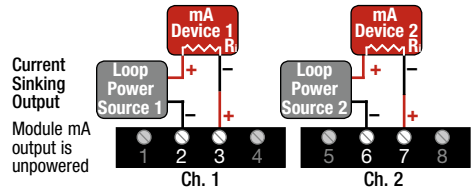


Wire terminal torque  
0.5 to 0.6 Nm or  
4.4 to 5.3 in-lbs

To avoid damage to the module, do not make any connections to unused terminals



mA output: determine if receiving device has a passive or powered input. The module can be wired for a sinking or sourcing mA output.



See manufacturer's specifications for wiring designations. Shield wires should be grounded at one end only.

To maintain full isolation avoid combining power supplies in common with inputs, outputs, or unit power.

Cu 60/75°C conductors  
14 AWG max.