**APD 3393**

**Potentiometer to DC Signal Splitter/Isolator/Transmitter, Factory Ranged**

1 Input: 100 Ω to 1 MΩ Potentiometer

2 Outputs: 0-1 V to 0-10 V, ±1 V to ±10 V, 0-1 mA to 20 mA, 4-20 mA

- 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
- Isolated Sample and Hold
- DC Signal Splitter
- DC Signal Isolator
- DC Signal Transmitter
- DC Signal Regulator
- DC Signal Source
- DC Signal Booster
- DC Signal Rescaler

### Potentiometer Input Ranges
- 3 wire connection and full potentiometer travel is required
- Consult factory for other ranges and configurations
- 1 VDC excitation provided to potentiometer

- **Minimum range:** 0-100 Ω
- **Maximum range:** 0-1 MΩ

### Input Impedance
- 100 Ω to 1 MΩ minimum

### Input Protection, Common Mode
- 100 dB minimum

### 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 DC to 0-20 mA DC, 4-20 mA DC
- 20 V compliance, 1000 Ω at 20 mA

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

### Output Loop Power Supplies
- 20 VDC nominal, regulated, 25 mA DC for each output channel
- May be selectively wired for sinking or sourcing mA output

### 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
- Standard: 70 milliseconds nominal
- DF option: Output noise levels will be greater than standard specifications. Consult factory.

### Isolation
- Full 4-way, 1200 Vats minimum

### Installation Environment
- IP 40, requires installation in panel or enclosure with adequate ventilation
- For use in Pollution Degree 2 Environment
- Mount vertically (as shown in picture) to a 35 mm DIN rail
- Allowing minimum 1” (25 mm) above and below housing vents for air circulation.

### Power
- 85-265 VAC, 50-60 Hz, 6 W maximum
- D versions: 9-30 VDC or 60-300 VDC, 6 W maximum

### Dimensions and Connectors
- 1.78” W x 4.62” H x 4.81” D
- 45 mm W x 117 mm H x 122 mm D
- Eight 4-terminal removable connectors, 14 AWG max wire size

### Description
- The APD 3393 IsoSplitter accepts a potentiometer 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 voltage drop across a stable 1 VDC excitation source is measured allowing any full-range 3-wire potentiometer to be used.
- 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) makes this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.
- I/O Sink/Source Versatility
- Standard on the APD 3393 are 20 VDC loop excitation supplies for each output channel. These 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

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>APD 3393</td>
<td>IsoSplitter 1 input to 2 outputs</td>
<td>85-265 VAC, 50/60 Hz or 60-300 VDC</td>
</tr>
<tr>
<td>APD 3393 D</td>
<td></td>
<td>9-30 VDC or 10-32 VAC</td>
</tr>
</tbody>
</table>

### 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, consult factory
- U: Conformal coating for moisture resistance

### Accessories
- Order as separate line item
- API BP4: Spare removable 4 terminal plug, black

---

**IsoSplitter® Potentiometer to DC Signal Splitter/Isolator/Transmitter, Factory Ranged**

1 Input: 100 Ω to 1 MΩ Potentiometer

2 Outputs: 0-1 V to 0-10 V, ±1 V to ±10 V, 0-1 mA to 20 mA, 4-20 mA

- 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 Aqc., DCS, & SCADA Systems**

### Potentiometer Input Ranges
- Consult factory for other ranges and configurations
- 1 VDC excitation provided to potentiometer

- **Minimum range:** 0-100 Ω
- **Maximum range:** 0-1 MΩ

### Input Impedance
- 100 Ω to 1 MΩ minimum

### Input Protection, Common Mode
- 100 dB minimum

### 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 DC to 0-20 mA DC, 4-20 mA DC
- 20 V compliance, 1000 Ω at 20 mA

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

### Output Loop Power Supplies
- 20 VDC nominal, regulated, 25 mA DC for each output channel
- May be selectively wired for sinking or sourcing mA output

### 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
- Standard: 70 milliseconds nominal
- DF option: Output noise levels will be greater than standard specifications. Consult factory.

### Isolation
- Full 4-way, 1200 Vats minimum

### Installation Environment
- IP 40, requires installation in panel or enclosure with adequate ventilation
- For use in Pollution Degree 2 Environment
- Mount vertically (as shown in picture) to a 35 mm DIN rail
- Allowing minimum 1” (25 mm) above and below housing vents for air circulation.

### Power
- 85-265 VAC, 50-60 Hz or 60-300 VDC, 6 W maximum
- D versions: 9-30 VDC or 60-300 VDC, 6 W maximum

### Dimensions and Connectors
- 1.78” W x 4.62” H x 4.81” D
- 45 mm W x 117 mm H x 122 mm D
- Eight 4-terminal removable connectors, 14 AWG max wire size

### Description
- The APD 3393 IsoSplitter accepts a potentiometer 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 voltage drop across a stable 1 VDC excitation source is measured allowing any full-range 3-wire potentiometer to be used.
- 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) makes this module useful for ground loop elimination, common mode signal rejection, and noise pickup reduction.
- I/O Sink/Source Versatility
- Standard on the APD 3393 are 20 VDC loop excitation supplies for each output channel. These 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

### 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, consult factory
- U: Conformal coating for moisture resistance

### Accessories
- 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 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

**Electrical Connections**

See wiring diagrams at right. Observe polarity. If the output does not function, check wiring and polarity.

* Do not make any connections to unused terminals or use them as wiring junctions for external devices. This may cause permanent damage to the module!

Input and output ranges are factory pre-configured (at 24°C ±1°C). Use the front-mounted Zero and Span potentiometers to calibrate the outputs.

**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.

**Channel 1 Output Device**

<table>
<thead>
<tr>
<th>Measuring or recording device accepts a voltage input.</th>
<th>– Terminal + Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.</td>
<td>3 (+) 4 (+)</td>
</tr>
<tr>
<td>Measuring or recording device accepts a mA (current) input and provides power to the current loop.</td>
<td>3 (+) 4 (+)</td>
</tr>
</tbody>
</table>

**Channel 2 Output Device**

<table>
<thead>
<tr>
<th>Measuring or recording device accepts a voltage input.</th>
<th>– Terminal + Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.</td>
<td>7 (+) 8 (+)</td>
</tr>
<tr>
<td>Measuring or recording device accepts a mA (current) input and provides power to the current loop.</td>
<td>7 (+) 8 (+)</td>
</tr>
</tbody>
</table>

**Potentiometer Input**

The potentiometer must be connected to all three signal input terminals as shown. 0-100% of the potentiometer range must be used. A stable 1 VDC source is used to excite the potentiometer. Voltage drop is measured across the potentiometer, thus allowing any full-range potentiometer to be used.

**Module Power Terminals**

Check label for module operating voltage to make sure it matches available power. The power supplies are fuse protected and the unit may be returned to AP for fuse replacement.

When using DC power, either polarity is acceptable, but for consistency, wire positive (+) to terminal 25 and negative (–) to terminal 26.

**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 spring 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.

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 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 maximum output signal. For example: 4 mA for a 4-20 mA output or –10 V for a ±10 V output.
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, the Span control will provide adjustment for the 20 mA or high end of the signal.
5. Repeat adjustments for both output channels for maximum 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 is factory set to approximately 50% output. Each 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 3393 IsoSplitter® accepts a potentiometer 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.

**ADJUSTMENTS**

* Do not make 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.

* To avoid damage to the module, do not leave any unused mA outputs disconnected. Use a 1000 Ohm 1/2 Watt resistor across unused mA terminals.

**Absolute Process Instruments**

1220 American Way Libertyville, IL 60048
Phone: 800-942-0015 Fax: 800-949-7502
api-usa.com