# IsoSplitter® RTD to DC Signal Splitter/Isolator/Transmitter, Factory Ranged — APD 1393

**1 Input:** 2 or 3 Wire RTD
**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/1393

- *One RTD Input to Two Independent DC Outputs*
- *Zero and Span for Each Output*
- *Full 1200 V Isolation*
- *Input and Output LoopTracker® LEDs*
- *Output Test Button for Each Channel*
- *Built-In Loop Power Supply for Sink/Source Output*

## Applications

- *Split, Convert Output From One RTD Sensor for PLC Input, Control and/or Validation*
- *Interface an RTD with Multiple Panel Meters, PLCs, Recorders, Data Acq., DCS, & SCADA Systems*

### Temperature Input Range

Factory configured, please provide complete sensor specifications and temperature range.
100°F (55°C) minimum span.

| | |
|---|---|
| RTD input: | Resistance at 0°C<br>Curve (385, 3916, 392 etc.)<br>Temperature range in °F or °C |
| RTD resistance: | Typically 10 Ω to 2000 Ω, 2 or 3 wire |
| Excitation current: | Typically 10 Ω: 10 mA, 100 Ω: 2 mA,<br>1000 Ω: 0.5 mA, 2000 Ω: 0.2 mA |
| Leadwire comp.: | < ±0.05% of span per 1 Ω change in<br>leadwire resistance, 3 wire 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<br>up to 20 VDC with M19, M29, M39 |
| Bipolar voltage: | ±1 VDC to ±10 VDC |
| Current: | 0-1 mADC to 0-20 mADC, 4-20 mADC<br>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 mADC 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

70 milliseconds nominal

### Isolation

Full 4-way, 1200 VRMS 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 10-32 VAC 50/60 Hz, 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

c UL us
File E145968
85-265 VAC, 60-300 VDC model only

6 YEAR WARRANTY

MADE IN USA

Applications Link
api-usa.com/apps

Free Factory I/O Setup!


Sink or Source mA Output for Each Channel
Removable Plugs
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
2 or 3 Wire RTD
Connect Sink or Source mA Input
Universal Power
See Wiring Diagrams on Next Page

### Description

The APD 1393 IsoSplitter accepts an RTD temperature input and provides two optically isolated and linearized DC voltage or current outputs. The sensor type and temperature range and each independent output range can be specified as required. This provides an economical solution when one temperature signal must be sent to two different devices.

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

The temperature input is linearized, 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.

### Output Sink/Source Versatility

Standard on the APD 1393 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 devices.

### 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.

## How to Order

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

**Sensor specifications, input temperature range**
**Channel 1 output range**
**Channel 2 output range**

See options at right

| Model | Description | Power |
|---|---|---|
| **APD 1393** | IsoSplitter<br>1 temperature<br>input to<br>2 DC outputs | 85-265 VAC, 50/60 Hz or 60-300 VDC |
| **APD 1393 D** | | 9-30 VDC or 10-32 VAC |

## Options and Accessories

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

| | |
|---|---|
| **R1** | Channel 1 output reversal (ie. 20-4 mA out) |
| **R2** | Channel 2 I output reversal (ie. 20-4 mA out) |
| **R3** | Channel 1 and channel 2 output 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 |
| **U** | Conformal coating for moisture resistance |

**Accessory—order as separate line item**

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

ABSOLUTE PROCESS INSTRUMENTS
1220 American Way Libertyville, IL 60048
Phone: 800-942-0315 Fax: 800-949-7502
api-usa.com

### 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 is 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. 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!

Each product is factory configured to your exact input and output ranges as indicated on the serial number label. The input range is factory pre-configured (at 24°C ±1°C).

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 API for fuse replacement.

### 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. See note about terminating an unused mA output channel.

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

### RTD Input
The sensor type and temperature range are factory configured. See the model/serial number label for sensor type and range.

The temperature sensor input is connected as shown in the wiring diagrams.

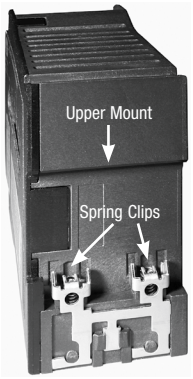
| Temperature Input | Term. | Term. | Term. |
|---|---|---|---|
| Two wire RTD | 17 Signal – | Jumper 18 & 19 | 19 Signal + |
| Three wire RTD | 17 Signal – | 18 Exc. | 19 Signal + |

### 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.

### 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 downward 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 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 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. For example: 4 mA for a 4-20 mA output or –10 V for a ±10V 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. It 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 Test Cal. potentiometer for the desired output level.

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

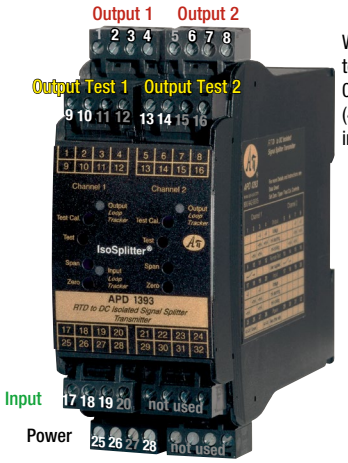
### Operation
The APD 1393 IsoSplitter® accepts an RTD input and provides two linearized and optically isolated DC voltage or current outputs.

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.

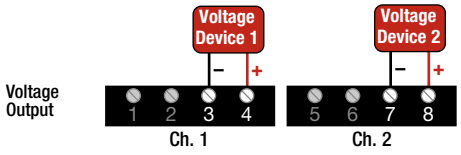
The two red LoopTracker output LEDs provide a visual indication that the output signals are functioning. They become brighter as the input and each corresponding output change from minimum to maximum.

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.



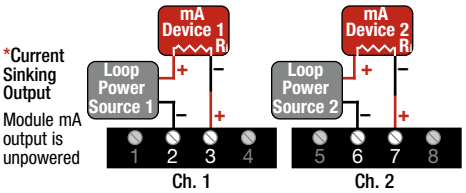

Wire terminal torque 0.5Nm to 0.6Nm (4.4 to 5.3 in-lbs)

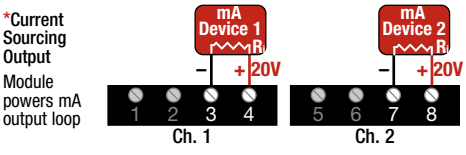
* Do not make connections to unused terminals!



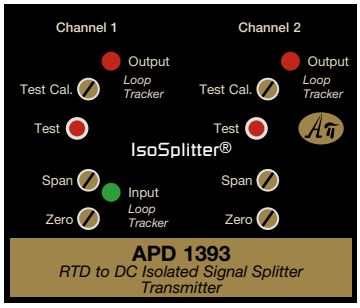

mA output: determine if receiving device has a passive or powered input. The module can be wired for a sinking or sourcing mA output.

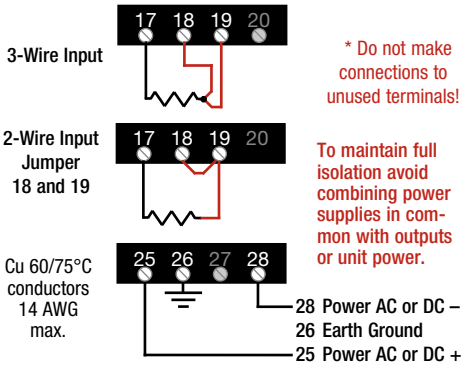
* To avoid damage to the module, do not leave any unused mA outputs disconnected. Use a 1000 Ohm 1/2 Watt resistor across unused mA terminals.








* Do not make connections to unused terminals!

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