

**1 Input:** 0-25 Hz to 0-20 kHz  
**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/7393](http://api-usa.com/7393)

- One Input to Two Outputs with Full Isolation
- Zero and Span Output Calibration Potentiometers
- 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

### Frequency Input Range

Factory configured, please specify input range  
 Frequency: 0-25 Hz to 0-20 kHz  
 Any waveform with 5 microsecond min. pulse, 100 mV min. amplitude change, 100 mV to 150 VRMS amplitude

### Input Impedance

10 kΩ nominal (maximum sensitivity)  
 100 kΩ nominal (minimum sensitivity)

### Input Sensitivity/Hysteresis

Multi-turn potentiometer for sensitivity adjustment  
 Maximum sensitivity: ±25 mV typical  
 Minimum sensitivity: ±2.5 V typical

### Input Protection

Normal mode protection: 200% of input rating  
 Common mode protection: 600 V input to ground

### Sensor Power Supply

15 VDC ±10%, regulated, 25 mADC, Max. ripple, less than 10 mVRMS. May be used to power 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 mADC to 0-20 mADC, 4-20 mADC  
 20 V compliance, 1000 Ω at 20 mA

### 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 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

### 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



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

**Free Factory I/O Setup!**

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



### 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 7393 IsoSplitter accepts a frequency 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 7393 is a 15 VDC sensor excitation supply for the input channel and 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

### Input range

**Channel 1 output range**

**Channel 2 output range**

See options at right

Model	Description	Power
APD 7393	IsoSplitter 1 input to 2 outputs	85-265 VAC, 50/60 Hz or 60-300 VDC
APD 7393 D		9-30 VDC or 10-32 VAC

### 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
- 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 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](http://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!

**Outputs**

Each product is factor configured to your exact ranges as indicated on the serial number label. Polarity must be observed for signal wiring connections. If the input and/or output do not function, check wiring and polarity.

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
Voltage input device	3 (-)	4 (+)
Passive mA device. APD module powers loop.	3 (-)	4 (+20 V)
mA device that powers the current loop.	2 (-)	3 (+)

Device for Output Channel 2	Terminal	Terminal
Voltage input device	7 (-)	8 (+)
Passive mA device. APD module powers loop.	7 (-)	8 (+20 V)
mA device that powers the current loop.	6 (-)	7 (+)

**Input**

The input range is pre-configured at the factory. No input calibration is necessary. The frequency input is compatible with most types of sensors that produce a minimum 100 mV amplitude change and a minimum 5 microsecond pulse width. A 15 VDC supply is available to power the sensor if required. Always refer to the sensor manufacturer's data sheet to determine supply voltage compatibility and proper wiring.

Frequency Sensor	Signal Com.	Sensor Power	Signal Input
2 wire or Namur, externally powered	n/a	18 (+15 V)	19 (+)
2 wire self generating (VR)	17 (-)	n/a	19 (+)
3 wire PNP or NPN	17 (-)	18 (+15 V)	19 (+)

**Sensor Load**

The frequency signal input is capacitively coupled to prevent any DC in the input. Some sensors, typically those without an internal load resistor, require a resistive load in order to function.

The resistor value may be specified by the sensor manufacturer as the "minimum resistive load" or calculated from the sensor manufacturer's specified "load current range".

The 15 VDC power supply is capable of providing 25 mA. A load current range of 3 mA to 25 mA would typically use a 5 kΩ to 500 Ω resistor.

**Module Power**

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.

Either polarity is acceptable for DC power, 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 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.

**Output Calibration**

Input and output ranges are factory pre-configured (at 24°C ±1°C). Front-mounted Zero and Span potentiometers are used to calibrate the output to compensate for load and lead variations.

1. Apply power to the module and allow a minimum 30 minute warm up time. An accurate frequency calibration source such as a signal generator may be required for calibration.
2. Provide an input to the module equal to the minimum input required for the application, typically 0 Hz.
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 frequency to the maximum required for the application. Using an accurate measurement device for the output, 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 signal, set the Span control for a 20 mA output.
5. Repeat adjustments for both output channels for maximum accuracy.

**Sensitivity Adjustment**

This multi-turn potentiometer provides an adjustable threshold level that the incoming signal must overcome before an output can be produced. This is used to limit noise and minimize false input signals that may cause erroneous readings.

Fully clockwise: (max. sensitivity), input threshold is ±25 mV.

Fully counterclockwise: (min. sensitivity), input threshold is ±2.5 volts.

**Output Test Function**

When a 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 7393 IsoSplitter® accepts a frequency input and provides two optically isolated DC voltage or current analog outputs that are linearly proportional to the input.

The frequency input is capacitively coupled (to remove any DC component at the input) to a comparator whose threshold is determined by the setting of the sensitivity control. The output from the comparator passes through an opto-coupler to the output stage.

The green LoopTracker® input LED provides a visual indication that the 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.

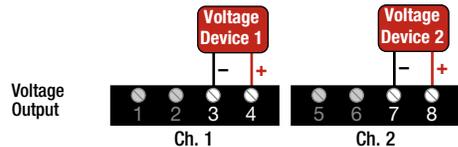
Two red LoopTracker output LEDs provide a visual indication that the output signals are functioning. They become brighter as the input and each corresponding output change from minimum to maximum.

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.



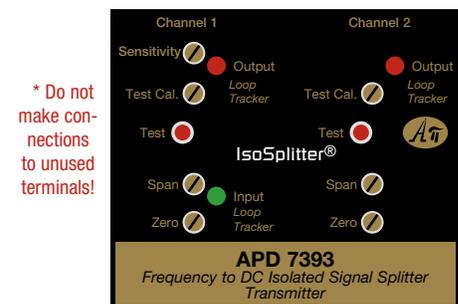
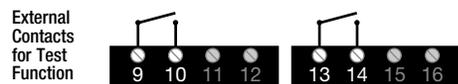
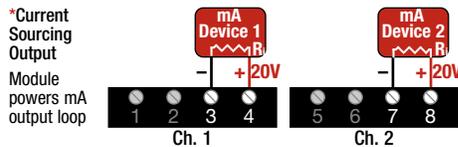
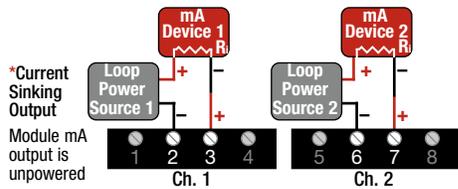
\* Do not make connections to unused terminals!

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



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!

