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

- 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

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 V$_{RMS}$ 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 mV$_{RMS}$
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 Ripple and Noise
Less than 10 mV$_{RMS}$

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

Accuracy
±0.1% of span (includes adjustment resolution and linearity)

Response Time
70 milliseconds typical

Isolation
Full 4-way, 1200 V$_{RMS}$ minimum

Ambient Temperature Range and Stability
–10°C to +60°C operating ambient
Better than 0.04% span/°C stability

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

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

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

LIFETIME WARRANTY

MADE IN USA

Quick Link
api-usa.com/7393

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

Removable Plugs

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 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.

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

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

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.

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 product 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.

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.

Upper Mount

Spring Clips
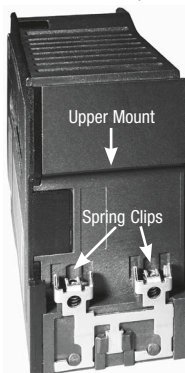
Output Calibration

The output range is pre-configured at the factory. 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. Example: for 4-20 mA output signal, set the Zero control for a 4 mA 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.
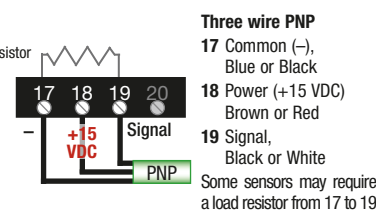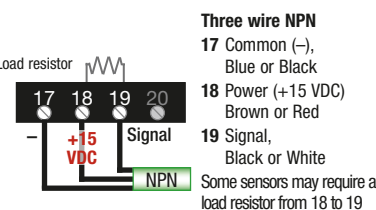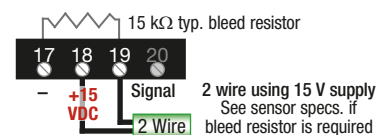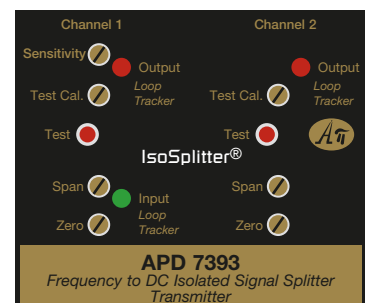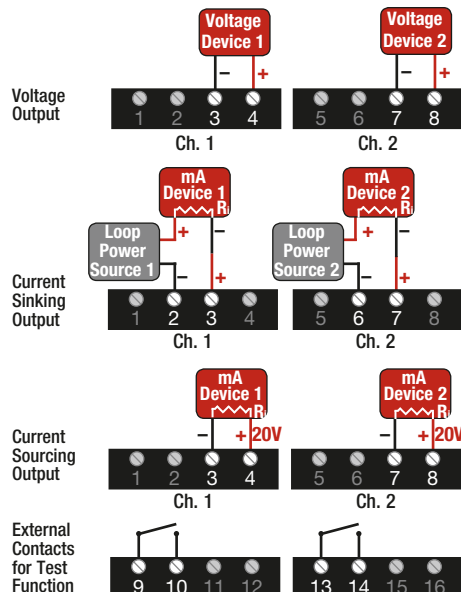
The frequency input is capacitively coupled (to remove any DC component at the input) to a comparator whose threshold is determined by the setting of the sensitivity control. The output from the comparator passes through an opto-coupler to the output stage.

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.
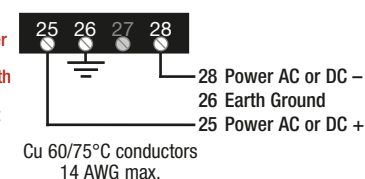
If the LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring.

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.

Voltage Output

Voltage Device 1   Voltage Device 2
1 2 3 4 — Ch. 1   5 6 7 8 — Ch. 2

Current Sinking Output

mA Device 1   Loop Power Source 1   mA Device 2   Loop Power Source 2
1 2 3 4 — Ch. 1   5 6 7 8 — Ch. 2

Current Sourcing Output

mA Device 1   +20V   mA Device 2   +20V
1 2 3 4 — Ch. 1   5 6 7 8 — Ch. 2

External Contacts for Test Function

9 10 11 12   13 14 15 16

Channel 1   **Channel 2**

Sensitivity   Output *Loop Tracker*   Output *Loop Tracker*
Test Cal.   Test Cal.
Test   Test
IsoSplitter®
Span   Input *Loop Tracker*   Span
Zero   Zero

APD 7393
Frequency to DC Isolated Signal Splitter Transmitter

15 kΩ typ. bleed resistor
17 18 19 20   – +15 VDC Signal 2 Wire

2 wire using 15 V supply See sensor specs. if bleed resistor is required

17 18 19 20   – Signal 2 Wire

2 wire self-generating

Load resistor
17 18 19 20   – +15 VDC Signal NPN

Three wire NPN
17 Common (–), Blue or Black
18 Power (+15 VDC) Brown or Red
19 Signal, Black or White
Some sensors may require a load resistor from 18 to 19

Load resistor
17 18 19 20   – +15 VDC Signal PNP

Three wire PNP
17 Common (–), Blue or Black
18 Power (+15 VDC) Brown or Red
19 Signal, Black or White
Some sensors may require a load resistor from 17 to 19

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

25 26 27 28
28 Power AC or DC –
26 Earth Ground
25 Power AC or DC +

Cu 60/75°C conductors 14 AWG max.