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 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 Aq., 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 mA DC, 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
- 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 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 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

**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 |

**Options and Accessories**
Options—add to end of model number
- R1 Channel 1 I/O reversal (e. 4-20 mA in to 20-4 mA out)
- R2 Channel 2 I/O reversal (e. 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 and 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!** Évitez les rejets de chocs! 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.

Electronic Connections

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

See wiring diagram 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 factory 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

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Device for Output Channel 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input device</td>
<td>3 (–) 4 (+)</td>
</tr>
<tr>
<td>Passive mA device, APD module powers loop</td>
<td>3 (–) 4 (+20 V)</td>
</tr>
<tr>
<td>mA device that powers the current loop</td>
<td>2 (+) 3 (–)</td>
</tr>
</tbody>
</table>

### Device for Output Channel 2

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Device for Output Channel 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input device</td>
<td>5 (–) 6 (+)</td>
</tr>
<tr>
<td>Passive mA device, APD module powers loop</td>
<td>7 (+) 8 (+20 V)</td>
</tr>
<tr>
<td>mA device that powers the current loop</td>
<td>6 (–) 7 (+)</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Sensor Load</th>
<th>Frequency Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 wire or Niarm, externally powered</td>
<td>10 (+15 V) 19 (+)</td>
</tr>
<tr>
<td>2 wire self generating (VR)</td>
<td>17 (–) 19 (+)</td>
</tr>
<tr>
<td>3 wire PNP or NPN</td>
<td>17 (–) 18 (+15 V) 19 (+)</td>
</tr>
</tbody>
</table>

### 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 fused and the unit may be returned to API for fuse replacement. Either polarity is acceptable for DC power, but for consistency, wave 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 lead 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 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 ±10 V 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 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 0.1% 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 signal 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.

### Outputs

For Test 1

**Output Test 1**

<table>
<thead>
<tr>
<th>Device</th>
<th>Voltage Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Power AC or DC</td>
<td>+15 V</td>
</tr>
</tbody>
</table>

**Output Test 2**

<table>
<thead>
<tr>
<th>Device</th>
<th>Voltage Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Power AC or DC</td>
<td>+15 V</td>
</tr>
</tbody>
</table>

Remove any connections to unused terminals.

* Do not make connections to unused terminals!

**Power AC or DC**

15 kΩ±lpd bleeder resistor

2 wire using 15 V supply

See sensor spec. if bleed resistor is required

2 wire self-generating

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 18 to 19

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

Cu 60/75°C conductors

14 AWG max.

28 Power AC or DC

26 Earth Ground

25 Power AC or DC +

Instructions

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