Two Independent Channels with Full Isolation

Zero and Span for Each Output

Input and Output LoopTracker LEDs

Output Test/Manual Override for Each Channel

Built-In I/O Power Supplies

Applications

Monitor a DC Signal and Temperature

Convert/Isolate Dual Output Transmitters

Channel 1 DC Input Range

Factory configured, please specify input type and range

Voltage: 0-10 mVDC to 0-100 VDC

Bipolar voltage: ±50 mVDC to ±10 VDC

Current: 0-1 mA DC to 0-50 mA DC, 4-20 mA DC

Voltage input impedance: 200 kΩ minimum

Current input impedance: 50 Ω typical

Input comm. mode rejection: 120 dB minimum

Current input voltage burden: 1.25 VDC max. at 20 mA

Input loop power supply: 15 VDC, ±10%, regulated, 25 mA DC, may be connected for sinking or sourcing mA input

Channel 2 RTD Input Range

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

RTD input:

Resistance at 0°C

Curve: (385, 3916, 392 etc.)

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,

1000 Ω: 0.5 mA, 2000 Ω: 0.2 mA

Leadwire comp.: < ±0.05% of span per 1 Ω change in leadwire resistance, 3 wire sensor

LoopTracker

Variable brightness LEDs indicate I/O levels for each channel

Channel 1 and Channel 2 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 ±10 VDC

20 V compliance, 1000 Ω or 20 mA

Output Calibration

Multi-turn zero and span potentiometers for each output channel. 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

Front buttons set each output to test level when pressed

Each test level potentiometer adjustable 0-100% of span

How to Order

Models are factory ranged. See I/O ranges above left. Ranges and options for each channel must be specified on order

Channel 1 input range

Channel 2 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 (i.e. 20-4 mA out)
R2: Channel 2 I/O reversal (i.e. 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
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.
3. The module can now be removed from the DIN rail.

Calibration
Input and output ranges are factory pre-configured (at 24°C ±1°C). 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 minimum output signal. Example: for 4-20 mA output, the Span control will provide adjustment for the 20 mA or high end of the signal.
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 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 2001 accepts one DC voltage or current input and one RTD input and provides two optically isolated DC voltage or current outputs that are linearly related to the inputs.

Green LoopTracker input LEDs provide a visual indication that each signal is being sensed by the input circuitry of the module. They also indicate the input signal strength by changing in intensity as the process changes from minimum to maximum. If an LED fails to illuminate, or fails to change in intensity as the process changes, check the module power or signal input wiring. Note that it may be difficult to see the LEDs under bright lighting conditions.

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.

To avoid damage to the module, do not make any connections to unused terminals.

To avoid damage to the module, do not make any connections to unused terminals.

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.

Precautions
ATTENTION! Tout le câblage doit être effectué par un électricien ou ingénieur en instrumentation qualifié. Voir le diagramme pour designations 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.

Electrical Connections
Polarity must be observed for signal wiring connections. If the input and/or output do not function, check wiring and polarity.

Each product is factory configured to your exact input and output ranges as indicated on the serial number label.

Outputs
For milliamp 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 1</th>
<th>Terminal 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 (+)</td>
<td>4 (+)</td>
</tr>
<tr>
<td>3 (-)</td>
<td>4 (+20 V)</td>
</tr>
<tr>
<td>2 (+)</td>
<td>3 (-)</td>
</tr>
</tbody>
</table>

Device for Output Channel 2

<table>
<thead>
<tr>
<th>Terminal 1</th>
<th>Terminal 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (+)</td>
<td>8 (+)</td>
</tr>
<tr>
<td>7 (-)</td>
<td>8 (+20 V)</td>
</tr>
<tr>
<td>6 (-)</td>
<td>7 (+)</td>
</tr>
</tbody>
</table>

Input 1, DC
For milliamp 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.

DC Input Channel 1

<table>
<thead>
<tr>
<th>Terminal 1</th>
<th>Terminal 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 (-)</td>
<td>19 (+)</td>
</tr>
<tr>
<td>17 (+)</td>
<td>19 (-)</td>
</tr>
<tr>
<td>19 (-)</td>
<td>18 (+5 V)</td>
</tr>
</tbody>
</table>

Input 2, RTD Temperature
The sensor type and temperature range are factory configured. See the model/serial number label for sensor type and range.

Temperature Input Ch. 2

<table>
<thead>
<tr>
<th>Term.</th>
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<th>Term.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two wire RTD</td>
<td>21 RTD</td>
<td>Jumper 22 &amp; 23</td>
<td>23 RTD</td>
</tr>
<tr>
<td>Three wire RTD</td>
<td>21 RTD</td>
<td>22 Exc.</td>
<td>23 RTD</td>
</tr>
</tbody>
</table>

Module Power Terminals
Check model/serial number 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.

When using DC power, either polarity is acceptable, but for consistency, wire positive (+) to terminal 25 and negative (–) to terminal 28.