**4-20 mA Loop Powered Isolators**

**Input:** 4-20 mA, One or Two Channels  
**Output:** 4-20 mA, One or Two Channels

- Single or Twin Pack Fully Isolated Transmitters  
- High Output Drive  
- Low Input Voltage Burden  
- Output LoopTracker® LED  
- Functional Test Switch  
- Simple Plug-In Design

### Applications
- Isolate 4-20 mA Process Signals  
- Isolate Two Loops With One API LPI-2  
- Eliminate Ground Loops, Reduce Noise Effects

**4-20 mA Input**  
API LPI-1: One channel: 4 to 20 mA  
API LPI-2 Channel 1: 4 to 20 mA  
Channel 2: 4 to 20 mA

**Input Voltage Burden**  
Approximately 9 VDC at 20 mA  
See graph on back

**Common Mode Rejection**  
Negligible output effect for 50/60 Hz common mode signals

**LoopTracker**  
Continuous visual indication of output loop current  
LED brightness varies with current level over 4-20 mA range

**4-20 mA Output**  
API LPI-1 One channel: 4 to 20 mA  
API LPI-2 Channel 1: 4 to 20 mA  
Channel 2: 4 to 20 mA

**Output Drive Capability**  
Up to 1000 Ω with 20 V compliance at 20 mA at 30 VDC or approximately 750 Ω at 24 VDC depending on the supply voltage of the input loop.  
See graph on back

**Change in Load Effect**  
Less than ±0.08% of span for load changes from 0 Ω to 1000 Ω

**Output Calibration**  
Multi-turn zero and span potentiometers for output  
±10% of span adjustment range typical

**Calibration Reference Level**  
4.0 mA ±0.10 mA  
Requires a minimum of 4 mA input current

**Output Test Switch**  
Momentary contact switch with spring-loaded return  
Sets output to calibration reference level of 4 mA to allow testing of module circuits and output loop

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

**Response Time**  
60 milliseconds typical

**Isolation**  
API LPI-1: 1200 Vrms minimum, input to output  
API LPI-2: 1200 Vrms minimum, input to output, channel to channel

**Ambient Temperature Range and Stability**  
–10°C to +60°C operating ambient  
Better than ±0.2% of span per °C stability

**Housing and Sockets**  
IP 40, requires installation in panel or enclosure  
API 008 or API 008 FS socket  
Socket mounts to 35 mm DIN rail or can be surface mounted

---

**Output Test Switch**  
API LPI-1

**Output Test Switch**  
API LPI-2

---

**Description**  
The API LPI-1 is a single channel loop-powered isolator that accepts a 4-20 mA input and provides a linear and isolated output current proportional to the input. The API LPI-2 contains two completely independent and identical channels in the same housing. When calculating power usage and reviewing specifications, consider each channel separately. The API LPI-1 and each channel of the API LPI-2 function as two-wire transmitters that derive their operating power from the input loop eliminating the need for external power supplies and additional power wiring. Due to the unique design, the calibration and linearity of each channel is unaffected by output load changes from 0 to 1000 Ω. The API LPI-1 and API LPI-2 provide a cost effective, drop-in solution for eliminating the ground loops and noise problems commonly found in process loops.

**LoopTracker**  
An API exclusive feature includes a LoopTracker LED that varies in intensity with changes in the process input signal. The LED will extinguish if either the input or output loops should open. The API LPI-2 has one LoopTracker LED for each channel.

This provides a quick visual picture of your process loop at all times and can greatly aid in saving time during initial startup and/or troubleshooting.

**Output Test**  
The spring return functional test switch substitutes a stable 4.0 mA signal into the input loop to allow easy calibration or system testing without the need for external calibrators or wiring modifications.

**Installation**  
The LPI-1 and LPI-2 plug into an industry standard 8-pin octal socket sold separately. Sockets API 008 and finger-safe API 008 FS allow either DIN rail or panel mounting.

The plug-in design, isolation, and robust electronics allows the module to be quickly hot-swapped without removing the I/O signals.

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Input</th>
<th>Output</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>API LPI-1</td>
<td>4-20 mA</td>
<td>4-20 mA</td>
<td>4-20 mA loop</td>
</tr>
<tr>
<td>API LPI-2</td>
<td>2 independent 4-20 mA channels</td>
<td>2 independent 4-20 mA channels</td>
<td>4-20 mA loop</td>
</tr>
</tbody>
</table>

**Option—add to end of model number**  
U Conformal coating for moisture resistance

**Accessories—order as separate line item**  
API 008 8-pin socket  
API 008 FS 8-pin finger-safe socket  
API CLP1 Module hold-down spring for high vibration or mobile applications

---

© 04-14  
api-usa.com  
1220 American Way Libertyville, IL 60048  
Phone: 800-942-0315 Fax: 800-949-7502
Electrical Connections

**WARNING!** Turn signal input, output, and power supplies off before connecting or disconnecting wiring.

This module requires API 008 or finger-safe API 008 FS socket.

See wiring diagrams. All wiring must be performed by a qualified electrician or instrumentation engineer. Consult factory for assistance.

Signal Input Terminals

Polarity must be observed when connecting the signal input. If the input does not function, check wiring and polarity.

The LPI input sinks current. Your transmitter or an external loop power supply must provide power to the LPI input.

Signal Output Terminals

Polarity must be observed for output wiring connections. If the output does not function, check wiring and polarity.

Calibration

The API LPI-1 and API LPI-2 are factory calibrated and should not require recalibration in the field for loads of 0-1000 Ω.

On the API LPI-2, each channel is totally independent from the other and each input is isolated from its corresponding output.

Should recalibration (fine-tuning) be desired, independent Zero and Span controls (one set for each channel of the API LPI-2) are accessible through the top of the unit to adjust the module.

1. Wire unit as shown, apply power to the input and output module.
2. Using an accurate calibration source, provide a 4 mA input to module.
3. Using an accurate measurement device for the output, adjust the Zero potentiometer to 4 mA. The Zero control should only be adjusted when the input signal is at its minimum. This will produce a 4 mA output signal.
4. Using an accurate calibration source, provide 20 mA input to module.
5. Using an accurate measurement device for the output, adjust the Span potentiometer to 20 mA. The Span control should only be adjusted when the input signal is at its maximum. This will produce a 20 mA output signal.
6. Repeat adjustments for the second channel on the API LPI-2.

Output Test Function

The Test switch may be used to drive the device on the output side of the loop (a panel meter, chart recorder, etc.) with a known good signal which can be used as a system diagnostic aid during initial start-up or during troubleshooting.

This test signal is factory set to 4 mA. When the switch is released, the output will return to normal.

Operation

The API LPI-1 and API LPI-2 are passive devices that draw a small amount of power from the input loop to operate their isolation circuitry.

The red LoopTracker output LED provides a visual indication that the output signal is functioning. It becomes brighter as the input and the corresponding output change from minimum to maximum.

The red LED will only light if the output loop current path is complete. Failure to illuminate or a failure to change in intensity as the process changes may indicate a problem with the module input or output wiring. Note that it may be difficult to see the LED under bright lighting conditions.

![API LPI-1典型布线图](image)

![API LPI-2典型布线图](image)