**Channel 1: Bridge/Strain Gauge/Load Cell to DC**

- 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 Weight or Pressure and Speed
- Convert/Isolate Dual Output Transmitters

**Channel 1 Bridge Input Range**
Factory configured, please specify sensor mV/V and mV range
- Sensor range: 0-1 mV to 0-2000 mV
- Millivolt output range is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied.
- mV/V sensitivity X excitation voltage = total mV range

**Input Impedance**
- 1 MΩ minimum
- Input common mode rejection: 100 dB minimum

**Channel 1 Excitation Voltage**
- Range: 4 to 10 VDC factory set, please specify
- Adjustment: ±10% via front potentiometer
- Maximum output: 10 VDC maximum at 30 mA
- Stability: ±0.01% per °C
- Designed for one 350 Ω (or greater) sensor

**Channel 2 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

**Channel 2 Sensor Power Supply**
- 15 VDC ±10%, regulated, 25 mA max., <10 mVrms max. ripple

**Channel 2 Characteristics**
- Impedance at max. sensitivity: 10 kΩ nom.
- Impedance at min. sensitivity: 100 kΩ nom.
- Sensitivity/hysteresis adjustment: Multi-turn potentiometer
- Sensitivity/hysteresis range: ±25 mV to ±2.5 V typical
- Normal mode protection: 200% of input rating
- Common mode protection: 600 V input to ground

**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 mA to ±25 mA, ±4 mA, ±20 mA
- 20 V compliance, 1000 Ω at 20 mA

**Output Calibration**
- Multi-turn zero and span potentiometers for each output channel
- ±15% of span adjustment range typical

**Output Characteristics**
- Linearity: ±0.1% of span
- Temperature stability: Better than 0.04% span/°C
- Output ripple and noise: Less than 10 mVrms

**Isolation**
- Full 5-way, 1200 Vrms minimum

**Response Time**
- Channel 1: 70 milliseconds nominal
- Output Loop Power Supplies
- 20 VDC nominal, regulated, 25 mA max. for each output channel
- May be selectively wired for sinking or sourcing mA output

**Output Test**
- Front buttons set each output to test level when pressed
- Each test level potentiometer adjustable 0-100% of span

**Installation Environment**
- Mount vertically to a 35 mm DIN rail
- For use in Pollution Degree 2 Environment
- IP 40 housing, requires installation inside an enclosure
- −10°C to +60°C operating ambient

**Connectors**
- 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

**APD 2057**
- DuoPak 2 channel
- Strain-Gauge, LED, Freq.-DC
- 85-265 VAC, 50/60 Hz or 60-300 VDC
- 9-30 VDC or 10-32 VAC

**Specifications**
- Sink or Source mA Output for Each Channel
- Adjustable Output Test Function for Each Channel
- Zero and Span for Each Channel
- Input LoopTracker LED for Each Channel
- Built-in Excitation Voltage for Strain Gauge
- Sensor Input Power Available for Frequency

**Dimensions**
- 17.8" W x 4.62" H x 4.81" D
- 45 mm W x 117 mm H x 122 mm D
- Height includes connectors

**LoopTracker**
- API exclusive features include four LoopTracker LEDs (green for each 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.
- Terminals are also 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.
- The test output level for each channel is potentiometer adjustable from 0 to 100% of the output span. The output test greatly aids in saving time during initial startup and/or troubleshooting.

**Options and Accessories**
- Options—add to end of model number
  - Channel 1 I/O reversal (i.e. 20-4 mA out)
  - Channel 2 I/O reversal (i.e. 20-4 mA out)
  - Channel 1 and channel 2 I/O reversal
  - Channel 1 high voltage output >10 V up to 20 V
  - Channel 2 high voltage output >10 V up to 20 V
  - Channel 1 and channel 2 high voltage output
  - Conformal coating for moisture resistance

**Accessories—order as separate line item**
- API BP4 Spare removable 4 terminal plug, black
Module Power Terminals
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.

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

Mounting to a DIN Rail
Install modules 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 lever up against the bottom edge of DIN rail.
2. Push front of module upward until upper mount snaps into place.

Removal
Always shock hazard! 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 min. 30 minute warm up time.
2. Using an accurate voltmeter on terminals 18 and 20 adjust the excitation voltage fine adjustment potentiometer to the strain gauge manufacturer’s recommended value.
3. Using an accurate calibration source, input to the module up to the minimum input required for the application.
4. 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 -0.1 V for a ±0.1 V output.
5. 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, set the Span control to 20 mA.
6. Repeat adjustments for both channels for maximum accuracy.

Ch. 2 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 the 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 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 2057 accepts one strain gauge input and one frequency 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 indicates 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.

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.

Absolute Process Instruments
1220 American Way Libertyville, IL 60048
Phone: 800-942-0315 Fax: 800-949-7502
api-usa.com