Strain Gauge Transducer Alarm Trips, Isolated, Factory Configured

**Input:**
- 100 Ω to 10,000 Ω Bridges, 5 mV to 2000 mV, 1-10 VDC Excitation

**Output:**
- Two 8 Amp SPDT Relays

### Applications
- Load Cell Weighing Systems and Scales
- Strain Gauge Pressure Sensors and Transducers
- Tanks, Scales, Extruder Melt Pressure, Crane Loads

### Strain Gauge Input Range
- Factory configured, specify sensor mV/V rating and mV range
- Minimum sensor rating: 5 mV
- Maximum sensor rating: 2000 mV
- Millivolt range is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied.
- mV/V sensitivity × excitation voltage = total mV range

### Input Impedance
- 1 MΩ minimum

### Isolation
- Power to input isolation: 1200 V
- Common mode protection: 600 VAC or 600 VDC

### Excitation Voltage
- Factory configured, please specify excitation voltage
- Refer to the sensor manufacturer’s recommendations.
- Excitation: 1 to 10 VDC, 30 mA max.
- Fine adjustment: Approximately ±0.25 VDC
- Stability: ±0.01% per °C
- Designed for one 350 Ω (or greater) sensor

### LoopTracker
- Variable brightness LED indicates input loop level and status

### APD 1500 Relay Output
- Dual SPDT Form C contact sets operating in unison
- 1 setpoint adjustment, 1 deadband adjustment
- Standard: HI alarm, non-latching, normal acting
- Options: L0 alarm, latching, reverse acting

### APD 1520 Relay Output
- 2 independent SPDT Form C contact sets
- 2 setpoint adjustments, 2 deadband adjustments
- Standard: HI/LO alarm, non-latching, normal acting
- Options: L0/LO, HI/LO, LO/Hi alarms, latching, reverse acting

### Relay Contact Ratings
- 8 A max @ 240 VAC resistive load
- External protection contact such as an RC snubber is recommended for inductive loads

### 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
- Four 4-terminal removable connectors, 14 AWG max wire size

### Power
- 85-265 VAC, 50/60 Hz or 60-300 VDC, 2 W maximum
- D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 2 W maximum

### Dimensions
- 0.89” W x 4.62” H x 4.81” D
- (22.5 x 117 x 122 mm)

### Description
- The APD 1500 and APD 1520 accept a strain gauge, bridge, or load cell input and provide a visual alarm indication and alarm relay contact outputs.
- The input is factory configured to a specific excitation voltage and millivolt input range. The input can be configured as zero-based (i.e., 0 to 20 mV), bipolar (i.e., −30 to +30 mV) for push-pull applications, or offset (i.e., 5 to 33 mV) to electronically compensate for deadweights (tare).
- The alarm types are factory configured.
- Front-accessible potentiometers are used to adjust alarm setpoint and deadband.

### LoopTracker and Alarm Status LEDs
- API exclusive features include a LoopTracker LED that varies in intensity with changes in the process input signal.
- A red/green bicolor alarm status LED (two on the APD 1520) visually indicate alarm status. These LEDs provide a quick visual picture of your process at all times.

### Output Test / Unlatch
- The API exclusive Output Test button can be used to verify the alarm and system operation and also provides the additional function of unlatching the alarm when the latching option has been ordered. This feature can be remotely operated.
- The output test button greatly aids in saving time during initial startup and/or troubleshooting.

### Alarm Options—add to end of model number
- L: APD 1500 with LO trip. Alarm trips on decreasing signal.
- HH: APD 1520 with HI/Hi trip. Alarms trip at their respective trip points on increasing signal.
- LL: APD 1520 with LO/LO trip. Alarms trip at their respective trip points on decreasing signal.
- LH: APD 1520 with LO/Hi trip. Alarm 1 trips on decreasing signal. Alarm 2 trips on increasing signal.
- HT: Latching alarm with push button reset
- HP: Latching alarm with power-off reset. Module power must be turned off to reset alarms
- U: Conformal coating for moisture resistance

### 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 des indications de ports 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

See wiring diagrams. If the module does not function, check all wiring.

* 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!

Input

See the model/serial number label for sensor mV/V rating and/or mV range, excitation voltage and options. The input is factory pre-configured (at 24°C ±1°C) and does not require adjustment.

The input is connected as shown in the wiring diagrams. Refer to strain gauge manufacturer’s data sheet for wire color-coding. Polarity must be observed when connecting inputs. CAUTION: Never short the excitation terminals together. This will cause internal damage to the module.

After installation and after all connections are made, the excitation fine adjust potentiometer may be used to precisely trim the excitation voltage approximately ±0.25 VDC.

Alarm Types

Note that the deadband is symmetrical about the setpoint; relay trip and reset points will both change if either the setpoint or deadband are changed.

High Alarm (default, H, or HH): The alarm relay changes state when the input signal exceeds the deadband trip point. For a forward acting alarm, the relay coil is energized in a non-alarm condition and a red LED indicates an alarm condition.

Low Alarm (L or LL): The alarm relay changes state when the input signal falls below the deadband reset point. For a low alarm the trip point is below the reset point.

PT 2: Latching alarm with push button reset

HP: Latching alarm with power-off reset. Module power must be turned off to reset alarms

R: Reverse-acting alarms. Relay coils energized in an alarm condition. No alarm condition with module power off.

Relay Output Terminals

See wiring diagrams for connections. APD modules do not provide power to the relay contacts. Inductive loads (motors, solenoids, contactors, etc.) will greatly shorten relay contact life unless an appropriate RC snubber is installed.

The APD 1500 operates two sets of relays in unison with a single setpoint. The dual SPD PT contact sets are in a Form C configuration.

The APD 1520 operates two sets of relays independently, each with its own setpoint. The dual SPD PT contact sets are in a Form C configuration.

Module Power

Check model/serial number label for module operating voltage to make sure it matches available power.

When using DC power, either polarity is acceptable, but for consistency with similar API products, positive (+) can be wired to terminal 13 and negative (–) can be wired to terminal 16.

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 downward and position against DIN rail.
2. Clip lower mount to bottom edge of DIN rail.
3. Push front of module upward until upper mount snaps into place.

Removal

1. Push up on the bottom back of the 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.

Setpoint and Deadband Adjustments

The Setpoint potentiometer allows the operator to adjust the level at which the alarm is activated. This control is adjustable from 0 to 100% of the input range.

The Deadband potentiometer allows the alarm trip and reset window to be adjusted symmetrically about the setpoint from 1 to 100% of the span. This allows the operator to fine tune the point at which the alarm trips and resets.

Set the signal source to the desired trip point. Adjust the setpoint control to the point at which the relay changes state from a non-alarm to an alarm condition.

Turn the deadband potentiometer clockwise for a larger amount of deadband. The deadband is symmetrical about the setpoint; both transition points will change as deadband is increased.

Relay set and reset points will both change if the setpoint or deadband are changed. Completely set the setpoint and deadband until the desired trip and reset points are set.

Output Test Function

When the front test button is depressed it will drive the relays to their opposite state. A customer-supplied switch connected to terminals 4 and 6 can also be used to toggle the relays.

When released, the relays will return to their prior states.

This can be used as a diagnostic aid during initial start-up or troubleshooting, or as a manual over-ride function. The Test button also resets the relays on models with the HT option.

Operation

The green LoopTracker® input LED provides a visual indication that a 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.

The bicolour LED provides a visual indication of the alarm status. In all configurations, a green LED indicates a non-alarm condition and a red LED indicates an alarm condition.

In the normal mode of operation, the relay coil is energized in a non-alarm condition and de-energized in an alarm condition. This will create an alarm condition if the module loses power. For a normal acting, non-latching configuration, the alarm will activate when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then will automatically reset when the alarm condition no longer exists.

For a reverse acting alarm, the relay coil is de-energized in a non-alarm condition and energized in an alarm condition. The alarm activates when the input signal exceeds the setpoint (HI alarm) or falls below the setpoint (LO alarm), then automatically resets when the alarm condition no longer exists.

For models with the latching relay option, it will be necessary to push the Test button or remove power from the module to reset the alarm, depending on the type of latching option. The alarm will only reset if the alarm condition no longer exists.

Relay Wiring APD 1500, APD 1520

Customer-Supplied Remote Test Switch

Relay Wiring APD 1500

Customer-Supplied Remote Test Switch

Relay Wiring APD 1520

Sensor shield wire (if equipped) should be grounded at one end only.

WARNING: Do not make connections to unused terminals!