**DC Input Alarm Trip, Field Configurable**

**API 1080 DIN**

**Input:** 0-50 mV to ±10 VDC or 0-1 mA to 4-20 mA  
**Output:** One 7 Amp DPDT Relay

- **Field Selectable Input Ranges**
- **Selectable Relay Configuration & Adjustable Setpoints**
- **Input LoopTracker® & Alarm Status LEDs**
- **Alarm Test/Reset Push button**
- **Built-In 4-20 mA Loop Power Supply**
- **Compact 22.5 mm Wide DIN Package**
- **Operates on Wide Ranges of AC or DC Power**

**Applications**
- Process Limit Backup Alarm
- Tank Level Alarm
- Over, Under, Out-of-Range Alarm

**Specifications**

<table>
<thead>
<tr>
<th>Input Ranges</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage:</td>
<td>0-50 mVDC</td>
<td>±10 VDC</td>
</tr>
<tr>
<td>Current:</td>
<td>0-1 mAADC</td>
<td>0-20 mAADC</td>
</tr>
</tbody>
</table>

See chart on other side for standard ranges  
Consult factory for other available switch selectable ranges

**Input Impedance**
- Voltage inputs: 250 kΩ minimum  
- Current inputs: 50 Ω typical

**Input Voltage Burden**
- 1.0 VDC typical at 20 mA

**Input Loop Power Supply**
- 12 VDC ±10%, regulated, 25 mA max. Max. ripple <1.5 Vp-p

**LoopTracker**
Variable brightness LED indicates input loop level and status

**Relay Output**
- One DPDT contact, field configurable  
- 7 A @ 240 VAC resistive load  
- 3.5 A @ 240 VAC inductive load  
- 8 A @ 30 VDC maximum

CAUTION: External contact protection such as an RC snubber is recommended for inductive loads.

**Setpoint**
- 12 turn potentiometer adjustable from 0 to 100% of span

**Deadband**
Adjustable from 1.0 to 100% of span, 12 turn potentiometer

**Functional Test/Reset Button**
Toggles relay to opposite state when pressed  
Resets latching relay if latching relay mode was selected

**Response Time**
- 70 milliseconds typical

**Ambient Temperature Range and Temperature Stability**
- −10°C to +60°C operating ambient  
- Better than ±0.02% of span per °C temperature stability

**Case Material**
Polycarbonate, gray UL #94V-1 housing and black UL #94V-2 terminals

**Power**
- 60-265 VAC or 85-300 VDC, 50/60 Hz, 2 W max.

**Description and Features**

The API 1080 DIN accepts a DC voltage or current input and provides a visual alarm indication and DPDT alarm relay contact output when the input exceeds a high alarm trip point or falls below a low alarm trip point. 15 voltage and 9 current input ranges can be field-configured via external rotary and slide switches. Offset ranges such as 1-5 VDC and 4-20 mAADC are also included. Consult the factory for other available ranges.

API exclusive features include a LoopTracker LED that varies in intensity with changes in the process signal, a bi-color alarm status LED, and a Functional Test push button to toggle the relay independent of the input. The green LoopTracker LED varies in intensity with changes in the process input signal. Monitoring the state of this LED can provide a quick visual picture of your process loop at all times. The functional test push button can be used to verify the alarm and system operation and also provides the additional function of unlatching the alarm when the latching mode has been selected.

Heavy-duty relay contacts allow the module to directly control high capacity loads. The API 1080 DIN provides a single setpoint adjustment of the DPDT relay contacts. The alarm output can be field configured for HI or LO operation, latching or non-latching, and normal or reverse acting. Front-accessible potentiometers are used to adjust both the deadband from 1 to 100% and the alarm setpoint from 0 to 100%.

This module includes a regulated 12 VDC loop excitation supply that can be used to power an external loop-powered transmitter or other passive input device eliminating the need for an additional DC loop supply.

The API 1080 DIN is designed to mount on an industry-standard DIN rail. The narrow 22.5 mm wide DIN style housing allows for side-by-side mounting of multiple modules for maximum I/O density.

**Models, Options & Accessories**

**Free Setup—Specify input range and output range**

**API 1080 DIN**  
Field rangeable DC input, DPDT alarm trip, with loop power supply, 60-265 VAC or 85-300 VDC powered

**Options—Add to end of model number**

**U**  
Conformal coating for moisture resistance

**Accessories—Order as a separate line item**

**API TK36**  
DIN rail, 35 mm W x 39” L, aluminum

**Discontinued, see APD 1080**

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API 1080 DIN Installation and Setup

ELECTRICAL CONNECTIONS

WARNING! All wiring must be performed by qualified personnel only. This module requires an industry-standard DIN rail mount. Order API TK36 DIN rail separately.

Power Input Terminals – The label on the side of the API module will indicate the voltage requirements. Power is connected to terminals 10 and 12. Observe polarity when using DC power. Positive (+) is wired to terminal 12 and negative (–) is wired to terminal 10. Terminal 11 earth ground may be used if required.

Powered Signal Input – Polarity must be observed when connecting the signal input. The positive connection (+) is applied to terminal 8 and the negative (–) is applied to terminal 7.

Using the 12 VDC Power Supply with a Passive Signal Input – This may save the expense of purchasing a separate power supply for the input device. A passive input device can be powered by the 12 volt DC power supply at terminal 9. Polarity must be observed when connecting the signal input. Typically the positive (+) lead is wired to terminal 9 and the negative (–) lead is connected to terminal 8. A typical example is shown. It is very important to consult the manufacturer of your specific sensor to determine its compatibility and proper wiring.

Relay Output Terminals – Terminals 1, 2, 3 and 4, 5, 6 provide the appropriate connections for the desired relay operations. (NC = Normally Closed, C = Common, NO = Normally Open).

WIRING EXAMPLES

API 1080 DIN With Powered Current or Voltage Input

<table>
<thead>
<tr>
<th>Contact Set 1</th>
<th>Contact Set 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power AC or DC (–)</td>
<td>Power AC or DC (+)</td>
</tr>
<tr>
<td>Power AC or DC (–)</td>
<td>Power AC or DC (+)</td>
</tr>
</tbody>
</table>

API 1080 DIN Using <12V Loop Power Supply

<table>
<thead>
<tr>
<th>Contact Set 1</th>
<th>Contact Set 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powered 4-20 mA or Voltage Input Device</td>
<td>Power AC or DC (–)</td>
</tr>
<tr>
<td>Power AC or DC (–)</td>
<td>Power AC or DC (+)</td>
</tr>
</tbody>
</table>

RANGE SELECTION

The API 1080 DIN input selector switch determines the input impedance for the module. For current inputs, it is typically 50 or 100 kΩ. Voltage inputs have a typical 250 kΩ or greater for voltages above 200 mV. The switch settings will determine the exact operation of the module. Following are the standard input range and alarm configuration tables used to configure the API 1080 DIN. Set switches A, B, C and D accordingly.

EXAMPLE: For 4-20 mA DC input, HI alarm, non-latching, normal action. Set switches as follows: A = 1 (current); B = 3; C = F; D = 2

<table>
<thead>
<tr>
<th>VOLTAGE</th>
<th>Set switch A to &quot;V&quot;</th>
<th>CURRENT</th>
<th>Set switch B to &quot;C&quot;</th>
<th>ALARM CONFIGURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50 mV</td>
<td>0-1 mA C 1</td>
<td>HI No</td>
<td>Normal 2</td>
<td></td>
</tr>
<tr>
<td>0-100 mV</td>
<td>0-2 mA C 1</td>
<td>HI No</td>
<td>Reverse 6</td>
<td></td>
</tr>
<tr>
<td>0-200 mV</td>
<td>0-4 mA C 1</td>
<td>HI Yes</td>
<td>Normal 0</td>
<td></td>
</tr>
<tr>
<td>0-250 mV</td>
<td>0-8 mA C 1</td>
<td>HI Yes</td>
<td>Reverse 4</td>
<td></td>
</tr>
<tr>
<td>0-400 mV</td>
<td>12-10 mA C 2</td>
<td>LO No</td>
<td>Normal 3</td>
<td></td>
</tr>
<tr>
<td>0-500 mV</td>
<td>16-10 mA C 2</td>
<td>LO Yes</td>
<td>Reverse 7</td>
<td></td>
</tr>
<tr>
<td>0-1 V</td>
<td>16-10 mA C 2</td>
<td>LO Yes</td>
<td>Normal 1</td>
<td></td>
</tr>
<tr>
<td>0-2 V</td>
<td>20-20 mA C 1</td>
<td>LO Yes</td>
<td>Reverse 5</td>
<td></td>
</tr>
<tr>
<td>0-2.5 V</td>
<td>20-40 mA C 3</td>
<td>LO Yes</td>
<td>Reverse 5</td>
<td></td>
</tr>
<tr>
<td>0-4 V</td>
<td>31-31 mA C 3F</td>
<td>The product label and older data sheets indicate “SF” for these ranges, “3F” is the correct setting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5 V</td>
<td>31-31 mA C 3F</td>
<td>The product label and older data sheets indicate “SF” for these ranges, “3F” is the correct setting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10 V</td>
<td>51-51 mA C 3F</td>
<td>The product label and older data sheets indicate “SF” for these ranges, “3F” is the correct setting.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SETUP

Setpoint Control – This multi-turn 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.

Deadband Control – This 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. The deadband is typically used to prevent chattering of the relays or false trips when the process signal is unstable or changes rapidly.

Test Switch and Test Range – The functional Test push button toggles the alarm status independent of the input when depressed. It verifies the alarm and system operation without having to alter the input signal.

OPERATION

GREEN LoopTracker® Input LED – Provides a visual indication that a signal is being sensed by the input circuitry of the module. It 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, this may indicate a problem with module power or signal input wiring.

Bi-Color Alarm 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.

Alarm Relays – 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.

When the latching mode is selected, it will be necessary to push the functional test push button or remove power from the module to reset the alarm. The alarm will only reset if the alarm condition no longer exists.

CALIBRATION

The input ranges are factory calibrated and do not require adjustment.

To calibrate the alarm section, set the deadband control to the minimum. Set the signal source to a reference that represents the desired trip point. Adjust the setpoint control to the point at which the relay changes state from non-alarm to an alarm condition. The deadband will be 1.0% of span in this case.

If a larger amount of deadband is desired, the deadband control may be increased by turning the control clockwise. The deadband is symmetrical about the setpoint; both transition points will change as deadband is increased. In addition, the test button can be used at any time to toggle the relay state independently of the input and the output to verify system operation.

API maintains a constant effort to upgrade and improve its products. Specifications are subject to change without notice. Consult factory for your specific requirements.