

Input: 0-10 mV to 0-130 VDC, ±5 VDC, ±10 VDC, 0-200 µA to 0-50 mADC
Output: 0-1 V to 0-10 VDC, ±5 VDC, ±10 VDC, 0-2 mA to 20 mADC

- One Minute Setup for Hundreds of I/O Ranges
- External Switches & Tables for Range Selection
- Removable Plugs for Faster Installation
- Full 1200 V Input/Output/Power Isolation
- Input and Output LoopTracker® LEDs
- Output Test Button
- Built-In Loop Power Supplies for Sink/Source I/O

Applications

- Convert, Boost, and Rescale Process Signals
- Isolate Single-Ended (Common Ground) PLC Inputs
- Interface Process Signals with Panel Meters, PLCs, Recorders, Data Acquisition, DCS, & SCADA Systems

Input Ranges

Field selectable ranges via switch settings
 Voltage: 0-10 mVDC to 0-50 VDC
 Bipolar Voltage: ±50 mVDC to ±10 VDC
 Current: 0-200 µADC to 0-50 mADC

Input Impedance (Voltage)

Voltage: 1 MΩ minimum
 Current: 50 Ω typical
 Voltage Burden: 1 VDC at 20 mA current input

Input Loop Power Supply

15 VDC ±10%, regulated, 25 mADC
 Max. ripple, less than 10 mVRMS
 May be selectively wired for sinking or sourcing mA input

LoopTracker

Variable brightness LEDs indicate I/O loop level and status

Output Ranges

Switch selectable, field rangeable
 Voltage: 0-1 VDC to 0-10 VDC, 10 mA max
 Bipolar Voltage: ±1 VDC to ±10 VDC
 Current: 0-2 mADC to 0-25 mADC
 20 V compliance, 1000 Ω at 20 mA
 Output offset: ±100% in 15% increments

Output Linearity

Better than ±0.1% of span

Output Zero and Span

Multi-turn potentiometers to compensate for load and lead variations, ±15% of span adjustment range typical

Output Loop Power Supply

20 VDC nominal, regulated, 25 mADC
 Max. ripple, less than 10 mVRMS
 May be selectively wired for sinking or sourcing mA output

Output Ripple and Noise

Less than 10 mVRMS

Functional Test

Front button sets output to test level when pressed
 Potentiometer adjustable 0-100% of span

Response Time

70 milliseconds typical
 1 millisecond typical with DF option

Common Mode Rejection

120 dB minimum

Isolation

1200 VRMS minimum
 Full isolation: power to input, power to output, input to output

Ambient Temperature Range and Stability

-10°C to +60°C operating ambient
 Better than ±0.02% of span per °C stability

Power

80-265 VAC or 48-300 VDC, 2 W maximum
 D versions: 9-30 VDC or 10-32 VAC 50/60 Hz, 2 W maximum

Housing

Mounts to standard 35 mm DIN rail
 IP 40

Connectors

Four 4-terminal removable connectors
 14 AWG max wire size



Dimensions
 0.89" W x 4.62" H x 4.81" D
 22.5 mm W x 117 mm H x 122 mm D
 Height includes connectors

Description

The APD 4380 accepts a DC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input.

Typical applications include signal isolation, conversion, boosting or a combination of the three. Full 3-way isolation (input, output, power) makes this module useful for ground loop elimination, common mode signal rejection or noise pickup reduction.

I/O Sink/Source Versatility

Standard on the APD 4380 is a 15 VDC loop excitation supply for the input and a 20 VDC loop excitation supply for the output. These power supplies can be used to power passive mA devices if required.

For maximum versatility the input and output can each be selectively wired for sinking or sourcing. This allows the APD 4380 to work with any combination of powered or unpowered mA inputs and powered or unpowered mA outputs.

How to Order

All models are field rangeable. Please specify

Model APD 4380
 Order APD 4380 D for operation on low voltage power
 Options as required

Connect Sink or Source mA Output

Removable Plugs

Adjustable Output Offset

Output LoopTracker LED

Output Test Function

Front Zero and Span

Input LoopTracker LED

Hundreds of Range Selections

Connect Sink or Source mA Input

Actual Size



LoopTracker

API exclusive features include two LoopTracker LEDs (green for input, red for 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/or troubleshooting.

Output Test

An API exclusive feature includes the test button to provide a fixed output (independent of the input) when held depressed. The test output level is potentiometer adjustable from 0 to 100% of output span.

The output test button greatly aids in saving time during initial startup and/or troubleshooting.

Model	Input	Output	Power
APD 4380	Field configurable—specify range if factory is to set switches	Field configurable—specify range if factory is to set switches	80-265 VAC or 48-300 VDC
APD 4380 D	Field configurable—specify range if factory is to set switches	Field configurable—specify range if factory is to set switches	9-30 VDC or 10-32 VAC

Options—add to end of model number

- M01** Input/output reversal, such as 4-20 mA input to 20-4 mA output
- DF** Fast response time, consult factory
- U** Conformal coating for moisture resistance

Accessories—order as separate line item

- API TK36** DIN rail, 35 mm W x 39" L, aluminum
- API BP4** Spare removable 4 terminal plug, black

Range Selection

See table below to select I/O ranges when using a current input. It is generally easier to select ranges before installation. The module side label lists common ranges. See the model/serial number label for module information, options, or if a custom range was specified.

APD 4380 Current Input Range Selection

Switches A & B: Input range
 Switch C: Input offset
 Switch D: Output offset
 Switch E: Set to "V" for voltage output or set to "I" for current output

For ranges that fall between the listed ranges use the next highest setting and trim the output signal with the zero and span potentiometers.

Output	0-1 V	0-2 V	0-4 V	1-5 V	0-5 V	0-8 V	2-10 V	0-10 V	±5 V	±10 V	0-2 mA	0-4 mA	0-8 mA	2-10 mA	0-10 mA	0-16 mA	4-20 mA	0-20 mA
Switches	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE
Input	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE
0-200 µA	4300V	4308V	4301V	4306V	4309V	4302V	4307V	4303V	4304V	4305V	4300I	4308I	4301I	4306I	4309I	4302I	4307I	4303I
0-400 µA	4700V	4708V	4701V	4706V	4709V	4702V	4707V	4703V	4704V	4705V	4700I	4708I	4701I	4706I	4709I	4702I	4707I	4703I
0-800 µA	5300V	5308V	5301V	5306V	5309V	5302V	5307V	5303V	5304V	5305V	5300I	5308I	5301I	5306I	5309I	5302I	5307I	5303I
0-1 mA	4B00V	4B08V	4B01V	4B06V	4B09V	4B02V	4B07V	4B03V	4B04V	4B05V	4B00I	4B08I	4B01I	4B06I	4B09I	4B02I	4B07I	4B03I
0-1.6 mA	5700V	5708V	5701V	5706V	5709V	5702V	5707V	5703V	5704V	5705V	5700I	5708I	5701I	5706I	5709I	5702I	5707I	5703I
0-2 mA	4100V	4108V	4101V	4106V	4109V	4102V	4107V	4103V	4104V	4105V	4100I	4108I	4101I	4106I	4109I	4102I	4107I	4103I
0-2.6 mA	7300V	7308V	7301V	7306V	7309V	7302V	7307V	7303V	7304V	7305V	7300I	7308I	7301I	7306I	7309I	7302I	7307I	7303I
0-3.2 mA	D300V	D308V	D301V	D306V	D309V	D302V	D307V	D303V	D304V	D305V	D300I	D308I	D301I	D306I	D309I	D302I	D307I	D303I
0-4 mA	4500V	4508V	4501V	4506V	4509V	4502V	4507V	4503V	4504V	4505V	4500I	4508I	4501I	4506I	4509I	4502I	4507I	4503I
0-5 mA	4A00V	4A08V	4A01V	4A06V	4A09V	4A02V	4A07V	4A03V	4A04V	4A05V	4A00I	4A08I	4A01I	4A06I	4A09I	4A02I	4A07I	4A03I
0-5.2 mA	7700V	7708V	7701V	7706V	7709V	7702V	7707V	7703V	7704V	7705V	7700I	7708I	7701I	7706I	7709I	7702I	7707I	7703I
0-6.4 mA	D700V	D708V	D701V	D706V	D709V	D702V	D707V	D703V	D704V	D705V	D700I	D708I	D701I	D706I	D709I	D702I	D707I	D703I
0-8 mA	5100V	5108V	5101V	5106V	5109V	5102V	5107V	5103V	5104V	5105V	5100I	5108I	5101I	5106I	5109I	5102I	5107I	5103I
2-10 mA	5190V	5198V	5191V	5196V	5199V	5192V	5197V	5193V	5194V	5195V	5190I	5198I	5191I	5196I	5199I	5192I	5197I	5193I
0-10 mA	4000V	4008V	4001V	4006V	4009V	4002V	4007V	4003V	4004V	4005V	4000I	4008I	4001I	4006I	4009I	4002I	4007I	4003I
0-10.4 mA	F300V	F308V	F301V	F306V	F309V	F302V	F307V	F303V	F304V	F305V	F300I	F308I	F301I	F306I	F309I	F302I	F307I	F303I
0-13 mA	7B00V	7B08V	7B01V	7B06V	7B09V	7B02V	7B07V	7B03V	7B04V	7B05V	7B00I	7B08I	7B01I	7B06I	7B09I	7B02I	7B07I	7B03I
0-16 mA	5500V	5508V	5501V	5506V	5509V	5502V	5507V	5503V	5504V	5505V	5500I	5508I	5501I	5506I	5509I	5502I	5507I	5503I
4-20 mA	5590V	5598V	5591V	5596V	5599V	5592V	5597V	5593V	5594V	5595V	5590I	5598I	5591I	5596I	5599I	5592I	5597I	5593I
0-20 mA	4400V	4408V	4401V	4406V	4409V	4402V	4407V	4403V	4404V	4405V	4400I	4408I	4401I	4406I	4409I	4402I	4407I	4403I
0-20.8 mA	F700V	F708V	F701V	F706V	F709V	F702V	F707V	F703V	F704V	F705V	F700I	F708I	F701I	F706I	F709I	F702I	F707I	F703I
0-26 mA	7100V	7108V	7101V	7106V	7109V	7102V	7107V	7103V	7104V	7105V	7100I	7108I	7101I	7106I	7109I	7102I	7107I	7103I
0-32 mA	D100V	D108V	D101V	D106V	D109V	D102V	D107V	D103V	D104V	D105V	D100I	D108I	D101I	D106I	D109I	D102I	D107I	D103I
0-40 mA	5000V	5008V	5001V	5006V	5009V	5002V	5007V	5003V	5004V	5005V	5000I	5008I	5001I	5006I	5009I	5002I	5007I	5003I
0-50 mA	4800V	4808V	4801V	4806V	4809V	4802V	4807V	4803V	4804V	4805V	4800I	4808I	4801I	4806I	4809I	4802I	4807I	4803I

Electrical Connections

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. Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring. Polarity must be observed for input and output wiring connections. If the input and/or output do not function, check switch settings and wiring polarity.

Type of Device for Output	- Terminal	+ Terminal
Measuring/recording device accepts a voltage input.	3 (-)	4 (+) switch E set to "V"
Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.	3 (-)	4 (+20 V) switch E set to "I"
Measuring/recording device accepts a mA (current) input and provides power to the current loop.	2 (-)	3 (+) switch E set to "I"

Type of Input Device	- Terminal	+ Terminal
Sensor or transmitter with a voltage output.	9 (-)	11 (+)
Transmitter with a mA (current) output that provides power to the current loop. Typically a 3 or 4-wire device.	9 (-)	11 (+)
Transmitter with mA (current) output that is unpowered. Typically a 2-wire device. APD module provides loop power.	11 (-)	10 (+15 V)

APD 4380 Voltage Output

Set switch E to "V" for a voltage output. If your receiving device (such as a PLC or a display) uses a voltage input, use terminals 3 and 4 as shown at right.

APD 4380 Current Output

Set switch E to "I" for a current output. Determine if your receiving device (such as a PLC or a display) provides 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 input terminals if it provides power to the loop. If your device does not power the current loop, the APD can provide power using terminals 3 and 4 as shown at right. If it provides power to the loop, use terminals 2 and 3 as shown at upper right.

APD 4380 Current Input

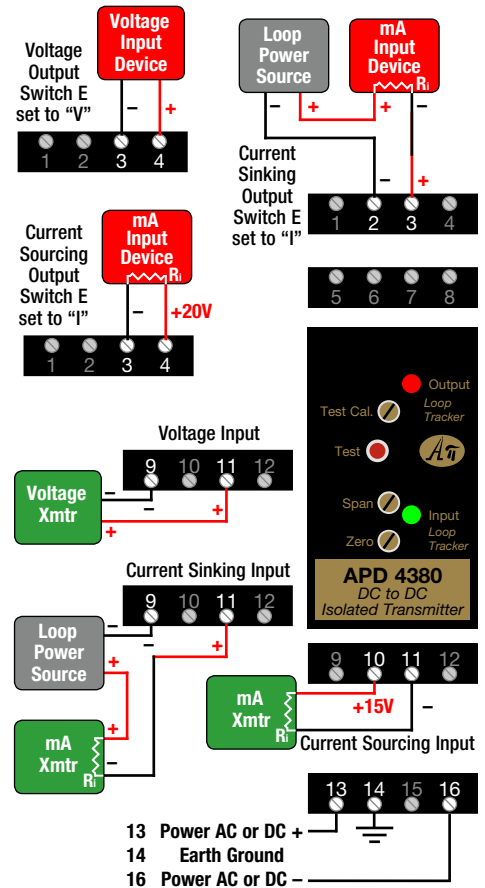
Determine if your transmitter provides power to the current loop or if the loop must be powered by the APD module. Typical voltage may be 9-24 VDC at your transmitter's output terminals if it provides power to the loop. If your transmitter or an external supply provides power to the loop, use terminals 9 and 11 as shown below right. If your transmitter does not power the current loop, the APD can provide power using terminals 10 and 11 as shown far right.

APD 4380 Voltage Input

If your transmitter provides a voltage output, use terminals 9 and 11 as shown at right.

Module Power Terminals

Check white 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.

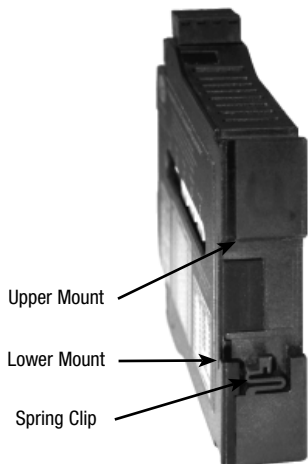


Precautions

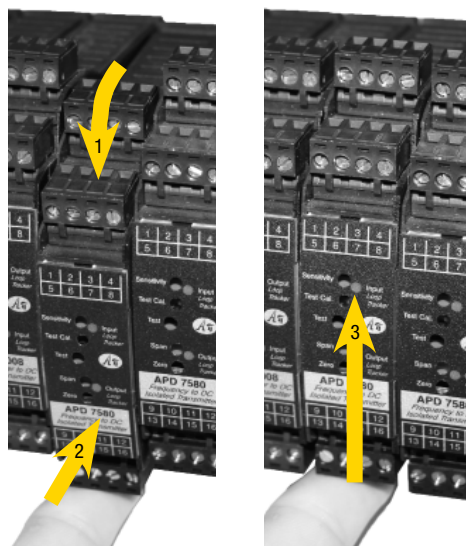
WARNING! Avoid shock hazards! Turn signal input, output, and power off before connecting or disconnecting wiring, or removing or installing module.

Installation Location

The housing clips to a standard 35 mm DIN rail. The housing is IP40 rated and should be mounted inside a panel or enclosure.



Installation

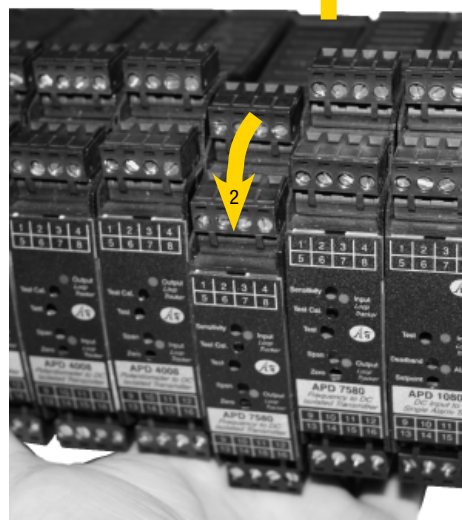


1. Tilt front of module downward and position against DIN rail.
2. Clip Lower Mount to bottom edge of DIN rail.
3. Push front of module upward until Upper Mount snaps into place.

Removal

Avoid shock hazards! Turn signal input, output, and power off before removing module.

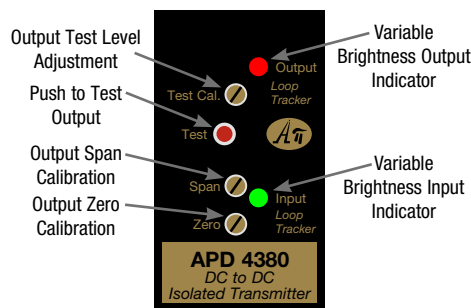
1. Push up on bottom back of module.
2. Tilt front of module downward to release Upper Mount from top edge of DIN rail.
3. The module can now be removed from the DIN rail.



Calibration

Front-mounted Zero and Span potentiometers are used to calibrate the output to compensate for load and lead variations.

1. Apply power to the module and allow a minimum 20 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 Zero control will provide adjustment for the 4 mA or low end of the signal.
4. Set the input at maximum and 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 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 aid during initial start-up or troubleshooting. When released, the output will return to normal.

The Test Cal. potentiometer is factory set to approximately 50% output. It 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 Test Cal. potentiometer for the desired output level.

Operation

The APD 4380 accepts a DC voltage or current input and provides an optically isolated DC voltage or current output that is linearly related to the input.

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. If the 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.

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.

For current outputs, 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.

Service

We service what we sell! Please obtain a Return Materials Authorization number (RMA#) by calling Customer Service at 800-942-0315 or following instructions for service at www.api-usa.com.

Include the RMA# and the return reason along with the product.

Shipping costs to us must be prepaid by the customer. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. API will not be responsible for

damage resulting from careless or insufficient packing or loss in transit. API will evaluate in-warranty products at no charge. API will evaluate out of warranty products for a nominal charge.

If API determines that the returned product is under warranty, it will repair the product or warranted parts thereof at no charge, or if unrepairable, replace it with the same or functionally equivalent product whenever possible.

Products or parts thereof not covered by warranty will be repaired or replaced at customer expense upon customer authorization.

API will return the warranted product at its expense and non-warranty product at customer expense.

API will use a shipping method (carrier to be at sole discretion of API) equal to or faster than the method used by the customer.

Warranty

Products manufactured or sold by Absolute Process Instruments Inc. (API) are warranted to be free from significant deviations in material and workmanship for the time period from date of purchase according to the product category below. During this time, and within the boundaries set forth in this warranty statement, API will, at its sole discretion, correct the product problem or replace the product.

API signal conditioners, alarms, transmitters:
Lifetime under terms stated herein.

This warranty shall not apply to product problems resulting from improper application, installation, incorrect wiring, operation outside of product specifications, abuse, misuse, unauthorized modification, accidents, power surges, power disruptions, power outages, static electricity, im-

proper voltages or currents, inadequate site maintenance or preparation, acts of God, weather and its effects, lightning, floods, fire, earthquake, war, riots, military action, etc.

API products are not for use for, with, or in any medical devices or applications including, but not limited to, patient care, life support systems or medical research. API assumes no responsibility or liability for any loss or damages resulting from use of a API product in a medical or life support application. API products are not for use for, with, or in any hazardous environments.

This warranty is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. API shall not be liable for

any special, incidental, or consequential damages, whether in contract, tort, or otherwise. In no event shall API be liable for direct, indirect, special, incidental or consequential damages (including loss of profits or loss of time) resulting from the performance of an API product. In all cases, API liability will be limited to the original cost of the product in question.

API reserves the right to make improvements in design, construction, and appearance of products without notice. API may at its sole discretion discontinue support, warranty, or repair of products which it deems are obsolete or for which repair parts are no longer available.

No employee or agent of API has the authority to modify the terms of this warranty in any manner whatsoever without the express written permission of API.

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