DC to DC Transmitters, Isolated

APD 4300, APD 4300 PLC

Input: 0-100 mV to 0-300 VDC, Bipolar Voltages, 0-1 mA to 0-900 mADC
Output: 0-1 V to ±10 VDC or 0-1 mA to 4-20 mA

- *Removable Plugs for Faster Installation*
- *Full 1200 V Input/Output/Power Isolation*
- *Input and Output LoopTracker® LEDs*
- *Functional Test Button with Remote Capability*
- *Built-In Loop Power Supplies for Input and Output*

Applications

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

LIFETIME WARRANTY

Free Factory I/O Setup!

Made in USA



Input Ranges
Factory configured—please specify input range or consult factory for special ranges
See table on other side for common ranges

Voltage:	0-100 mVDC to 0-300 VDC
Bipolar Voltage:	±100 mVDC to ±10 VDC
Current:	0-1 mADC to 0-900 mADC

Input Impedance (Voltage)
200 kΩ minimum

Input Voltage Burden (Current)
1.25 VDC maximum

Input Loop Power Supply
15 VDC nominal, regulated, 25 mADC
Max. ripple, less than 10 mV_{RMS}
May be selectively wired for sinking or sourcing mA input

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

LoopTracker
Variable brightness LEDs indicate I/O loop level and status

Output Ranges
Factory configured—please specify output range or consult factory for special ranges

Voltage:	0-1 VDC to 0-10 VDC
Voltage, M09 option:	up to 20 VDC
Bipolar Voltage:	±1 VDC to ±10 VDC
Current:	0-1 mADC to 0-20 mADC
	20 V compliance, 1000 Ω at 20 mA

Output Linearity
Better than ±0.1% of span

Output Loop Power Supply
20 VDC nominal, regulated, 25 mADC
Max. ripple, less than 10 mV_{RMS}
May be selectively wired for sinking or sourcing mA output

Output Ripple and Noise
Less than 10 mV_{RMS}

Functional Test
Front button sets output to test level when pressed or via external contact closure
Potentiometer adjustable 0-100% of span

Response Time
70 milliseconds typical

Common Mode Rejection
120 dB minimum

Isolation
1200 V_{RMS} 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 ±0.04% of span per °C stability

Power
80-265 VAC or 48-300 VDC
D versions: 9-30 VDC or 10-32 VAC

Dimensions
0.89" W x 3.94" H x 4.81" D (not including connectors)
0.89" W x 4.62" H x 4.81" D (height includes connectors)

Description
The APD 4300 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.

The APD 4300 PLC is factory configured for 4-20 mA input and output. A typical application includes signal isolation, ground loop elimination, common mode signal rejection, or noise pickup reduction for non-isolated PLC inputs. It is a convenient way to order an APD 4300 with popular 4-20 mA input and output ranges.

A loop excitation supply is included for a mA input as well as for any mA 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 4300 and APD 4300 PLC to work with any combination of sinking or sourcing mA transmitters and sinking or sourcing mA receiving devices.

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.

Functional Test
An API exclusive feature includes the Functional 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 functional test can also be enabled with a customer-supplied external contact closure across terminals 5 and 6. This allows remote testing of the output or, for example, a PLC-controlled manual override setting. The functional test button greatly aids in saving time during initial startup and/or troubleshooting.

How to Order

All models are factory ranged
The APD 4300 is configured to your specifications.
The APD 4300 PLC is configured for 4-20 mA I/O.
Milliamp inputs and outputs can be field wired for sink or source.

Please specify
Model (nothing else to specify for the APD 4300 PLC)
Input range
Output range
Options as required

Model	Input	Output	Power
APD 4300	Factory configured—specify range	Factory configured—specify range	80-265 VAC or 48-300 VDC
APD 4300 D			9-30 VDC or 10-32 VAC
APD 4300 PLC	4-20 mA, can be field wired for sink or source	4-20 mA, can be field wired for sink or source	80-265 VAC or 48-300 VDC
APD 4300 D PLC			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
M09	High voltage output up to 20 V (specify range)
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 4-terminal plug, black

Ranges

APD 4300 I/O ranges are set at the factory and must be specified when ordering. Listed below are commonly ordered input and output ranges. Consult factory for other available ranges or special ranges. See the white model/serial number label for module information, options, and I/O range information.

Common Voltage Inputs		
0-100 mV	1-5 V	±200 mV
0-200 mV	0-10 V	±500 mV
0-500 mV	0-20 V	±1 V
0-1 V	0-50 V	±2 V
0-2 V	0-100 V	±5 V
0-5 V	±100 mV	±10 V
Common Current Inputs		
0-1 mA	0-20 mA	0-100 mA
0-10 mA	4-20 mA	0-200 mA
0-16 mA	10-50 mA	0-500 mA
Common Voltage Outputs		
0-1 V	1-5 V	±5 V
0-5 V	0-10 V	±10 V
Common Current Outputs		
0-20 mA	0-16 mA	4-20 mA

Electrical Connections

WARNING! All wiring must be performed by a qualified electrician or instrumentation engineer. See diagram below 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.

Each product is factory configured to your exact input and output requirements as indicated on the product label.

Polarity must be observed for input and output wiring connections. If the input and/or output do not function, check power and wiring polarity.

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.

Signal Input Terminals

Polarity must be observed when connecting the signal input.

For a transmitter with a current output, determine if it provides power to the current loop or if it must be powered by the APD module. Use a multi-meter to check for voltage at the transmitter output terminals. Typical voltage may be in the range of 9 to 24 VDC. In this case, wire the device to terminals 9 and 11.

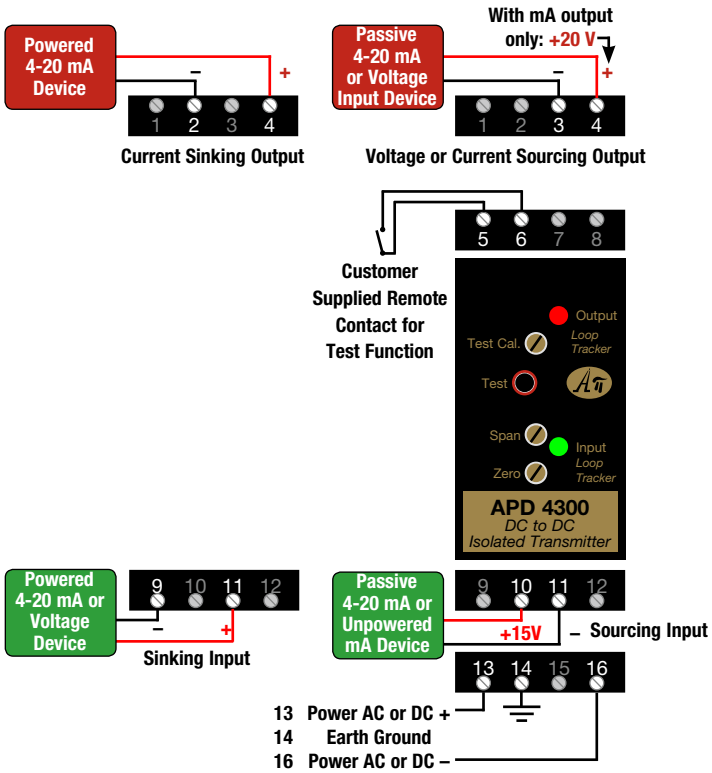
Type of Input Device	– Terminal	+ Terminal
Sensor or transmitter with a voltage output.	**9** (–)	**11** (+)
Transmitter with a mA (current) output that provides power to the current loop. Typically a 3 or 4-wire device.	**9** (–)	**11** (+)
Transmitter with mA (current) output that is unpowered. Typically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

Signal Output Terminals

Polarity must be observed when connecting the signal output.

If your device requires a current input, determine if it provides power to the current loop or if it must be powered by the APD module. Use a multi-meter to check for voltage at the input terminals. Typical voltage may be in the range of 9 to 24 VDC. In this case, wire the device to terminals 2 and 4.

Type of Device for Output	– Terminal	+ Terminal
Measuring/recording device accepts a voltage input.	**3** (–)	**4** (+)
Measuring/recording device accepts a mA (current) input and provides power to the current loop.	**2** (–)	**4** (+)
Measuring/recording device accepts a mA (current) input and the input is unpowered or passive. APD module provides the loop power.	**3** (–)	**4** (+20 VDC)



Calibration

Input and output ranges are pre-configured at the factory as specified on your order. Front-mounted, Zero and Span potentiometers can be 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. Next, set the input at maximum, 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, 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

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

When depressed it will drive the output with a known good signal. When released, the output will return to normal.

You can also enable the test function by connecting an external switch or button to terminals 5 and 6. This can be used as a remotely operated manual override to set the output at a fixed value regardless of the input signal.

Remote Test Function	Terminal	Terminal
Unpowered switch or contact	**5**	**6**

The Test Cal. potentiometer can be used to set the test output to the desired level. It is factory set to provide approximately 50% output. It is adjustable 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. When released, the output will return to normal.

Operation

The APD 4300 and APD 4300 PLC are factory configured to your exact input and output requirements. The input is filtered, either amplified or attenuated as required, then passed through to the output stage.

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.

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