Input: One 350 Ω Sensor, 1 mV to 2000 mV, 4-10 VDC Excitation

Output: 0-1 V to ±10 V or 0-1 mA to 4-20 mA, isolated

- Factory Set for Your Specified Range
- Full 3-Way Input/Output/Power Isolation
- Internal Excitation Power Supply
- DC Voltage or Current Output
- Simple Plug-In Design for Faster Installation
- Input and Output LoopTracker® LEDs
- Output Test or Calibration Resistor Options

9-30 VDC Power
85-265 VAC or 60-300 VDC

Simple Plug-In Design for Faster Installation
- Input and Output LoopTracker
- Full 3-Way Input/Output/Power Isolation
- Tanks, Scales, Extruder Melt Pressure, Crane Loads

Strain Gauge Input Range
Factory configured, please specify sensor mV/V and mV range
Minimum sensor range: 1 mV
Maximum sensor range: 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

Common Mode Rejection
100 dB minimum

Calibration Resistor Options
M01 option: Toggle switch with calibration resistor inside module. Specify resistor value.
M02 option: Toggle switch for external (load cell) calibration resistor.

Excitation Voltage
Factory configured, please specify excitation voltage
Maximum output: 10 VDC maximum at 30 mA
Internal adjustment: 4 to 10 VDC
Stability: ±0.01% per °C

Designed for one 350 Ω (or greater) sensor

LoopTracker
Variable brightness LEDs for input/output loop level and status

DC Output Range
Factory configured, please specify output range
Voltage: 10 VDC max.
Bipolar voltage (+10 mA max.): ±10 VDC to ±10 VDC
Current: 0-1 mA to 0-20 mA
Compliance, drive at 20 mA: 20 V, 1000 Ω drive

Output Calibration
Multi-turn zero and span potentiometers ±15% of span adjustment range typical

Output Test
Sets output to test level when pressed Adjustable 0-100% of span
Not available with M01 or M02 options

Output Ripple and Noise
Less than 10 mVrms

Linearity
Better than ±0.1% of span

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

Response Time
70 milliseconds (14.2 Hz) typical
Contact factory for other response times
Option DF: 10 milliseconds (100 Hz) response time typical

Isolation
1200 Vrms min.
Full isolation: power to input, power to output, input to output

Housing and Socket
IP 40, requires installation in panel or enclosure
Plugs into API 011 or API 011 FS socket
Socket mounts to 35 mm DIN rail or can be surface mounted

Power
Standard: 115 VAC ±10%, 50/60 Hz, 2.5 W max.
A230 option: 230 VAC ±10%, 50/60 Hz, 2.5 W max.
P option: 85-265 VAC 50/60 Hz, 60-300 VDC 2.5 W typ.
D option: 9-30 VDC, 2.5 W typical

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 output test button greatly aids in saving time during initial startup and/or troubleshooting. The output test level is potentiometer adjustable from 0 to 100% of output span.

The output test is not available with the M01 or M02 options. A calibration resistor switch replaces the test button.

Mounting
The API 4051 GI plugs into an industry standard 11-pin octal socket sold separately. Sockets API 011 and finger-safe API 011 FS allow either DIN rail or panel mounting.

Description
The API 4051 GI accepts a strain gauge, bridge, or load cell input and provides a proportional, isolated DC voltage or current output. It includes filtering and processing to allow effective use of low-level transducers in the noisy environments common in industrial applications.

The built-in bridge excitation power supply generates a stable source of excitation voltage to drive a 350 Ω (or greater) bridge type sensor such as a load cell, pressure transducer, or strain gauge and amplifies and converts the resulting millivolt signal into the factory configured output.

The API 4051 GI is factory configured to a specific excitation voltage, millivolt input (mV/V rating of the sensor multiplied by the excitation voltage), DC voltage or DC current output, and power. The input can be configured as zero-based (i.e., 0 to 20 mA), bi-polar (i.e., –30 to +30 mA for push-pull applications, or offset (i.e., 5 to 33 mV) to electronically compensate for deadweight (tare).

The output can be configured as zero-based, bi-polar, or offset. In addition to the standard output ranges, the API 4051 GI output can be configured meet most non-standard requirements. Contact the factory for assistance.

<table>
<thead>
<tr>
<th>Model</th>
<th>Input</th>
<th>Output</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>API 4051 GI</td>
<td>Factory ranged specify mV/V and excitation voltage</td>
<td>Factory ranged specify voltage or milliamp range</td>
<td>115 VAC</td>
</tr>
<tr>
<td>API 4051 GI A230</td>
<td>Factory ranged</td>
<td>Factory ranged</td>
<td>230 VAC</td>
</tr>
<tr>
<td>API 4051 GI P</td>
<td>Factory ranged</td>
<td>Factory ranged</td>
<td>85-265 VAC or 60-300 VDC</td>
</tr>
<tr>
<td>API 4051 GI D</td>
<td>Factory ranged</td>
<td>Factory ranged</td>
<td>9-30 VDC</td>
</tr>
</tbody>
</table>

Options—add to end of model number

M01 Switch with built-in calibration resistor. Specify resistor value.

M02 Switch for external calibration resistor

DF 10 millisecond response time, or consult factory. DF option will cause output noise levels greater than standard specifications.

U Conformal coating for moisture resistance

Accessories—order as a separate line item

API 011 11-pin socket, DIN rail or surface mount

API 011 FS 11-pin finger-safe socket, DIN rail or surface mount

API CLP1 Module hold-down spring for high vibration or mobile applications

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Precautions

ATTENTION! Tout le câblage doit être effectué par un électricien ou ingénieur en instrumentation qualifié. Voir le diagramme pour désignations des bornes 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 maintient 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.

WARNING: This product can expose you to chemicals including lead and nickel, which are known to the State of California to cause cancer or other reproductive harm. For more information go to www.P65Warnings.ca.gov

1. Power the module and allow a minimum 20 minute warm up time.
2. Using an accurate voltmeter across terminals 7 and 8, adjust the excitation voltage fine adjust potentiometer to the required voltage.
3. Provide an input to the module equal to zero or the minimum input required for the application.
4. Using an accurate measurement device for the module output, adjust the Zero potentiometer for the exact minimum output signal desired. The Zero control should only be adjusted when the input signal is at its minimum. The Zero pot may also be adjusted for a zero reading on the output display instrumentation, e.g. control system or process indicator. Adjusting the zero pot this way eliminates calibration errors in the display instrumentation.
5. Set the Test toggle switch to the Test position. The calibration resistor is switched into the circuit to unbalance the bridge.
6. Adjust the span pot for an 80% FS output or 80% reading on the process indicator, or per the manufacturer's percentage of FS output.
7. Return the Test switch to the opposite position and readjust the zero pot if necessary. The calibration procedure should be repeated to achieve the desired accuracy over the selected range.

Output Test Function

Note that models with the M01 or M02 option do not have a TEST function. With this option the Test switch operates the calibration resistor and the Test Cal. potentiometer is non-functional.

The test potentiometer is factory set to provide approximately 50% output. 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 can be used to set the test output to the desired level. 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.

Operation

Strain gauges and load cells are normally passive devices that are commonly referred to as bridges due to their four-resistor Wheatstone bridge configuration. These sensors require a precise excitation source to produce an output that is directly proportional to the load or pressure that is applied to the sensor. The exact output of the sensor (measured in millivolts) is determined by the sensitivity of the sensor (mV/V) and the excitation voltage applied.

The API 4051 GI provides the excitation voltage to the sensors and receives the resulting millivolt signal in return. This input signal is filtered and amplified, then offset, if required, and passed to the output stage. Depending on the output configuration ordered, a DC voltage or current output is generated.

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 level by changing in intensity as the process changes from minimum to maximum. If the LED fails to illuminate, it fails to change in intensity as the process changes, this may indicate a problem with module power or signal input wiring.

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.

Calibration, Models with Option M01 or M02

The M01 option uses a switch and a calibration resistor inside the module to allow a minimum 20 minute warm up time.

1. Power the module and allow a minimum 20 minute warm up time.
2. Using an accurate voltmeter across terminals 7 and 8, adjust the excitation voltage fine adjust potentiometer to the required voltage.
3. Provide an input to the module equal to zero or the minimum input required for the application.
4. Using an accurate measurement device for the module output, adjust the Zero potentiometer for the exact minimum output signal desired. The Zero control should only be adjusted when the input signal is at its minimum. The Zero pot may also be adjusted for a zero reading on the output display instrumentation, e.g. control system or process indicator. Adjusting the zero pot this way eliminates calibration errors in the display instrumentation.
5. Set the Test toggle switch to the Test position. The calibration resistor is switched into the circuit to unbalance the bridge.
6. Adjust the span pot for an 80% FS output or 80% reading on the process indicator, or per the manufacturer’s percentage of FS output.
7. Return the Test switch to the opposite position and readjust the zero pot if necessary. The calibration procedure should be repeated to achieve the desired accuracy over the selected range.

Output Test Function

Note that models with the M01 or M02 option do not have a TEST function. With this option the Test switch operates the calibration resistor and the Test Cal. potentiometer is non-functional.

The test potentiometer is factory set to provide approximately 50% output. 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 can be used to set the test output to the desired level. 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.

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Calibration, Models with Option M01 or M02

The M01 option uses a switch and a calibration resistor inside the module to allow a minimum 20 minute warm up time.

1. Power the module and allow a minimum 20 minute warm up time.
2. Using an accurate voltmeter across terminals 7 and 8, adjust the excitation voltage fine adjust potentiometer to the required voltage.
3. Provide an input to the module equal to zero or the minimum input required for the application.
4. Using an accurate measurement device for the module output, adjust the Zero potentiometer for the exact minimum output signal desired. The Zero control should only be adjusted when the input signal is at its minimum. The Zero pot may also be adjusted for a zero reading on the output display instrumentation, e.g. control system or process indicator. Adjusting the zero pot this way eliminates calibration errors in the display instrumentation.
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Output Test Function

Note that models with the M01 or M02 option do not have a TEST function. With this option the Test switch operates the calibration resistor and the Test Cal. potentiometer is non-functional.

The test potentiometer is factory set to provide approximately 50% output. 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.

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