

- **Low Noise: 10 $\mu\text{g}/\sqrt{\text{Hz}}$ Typical for $\pm 2\text{g}$ Full Scale Versions**
- **-55 to +125°C Operating Temperature Range**
- Flexible +8 to +32 VDC Power
- Excellent Long Term Stability
- $\pm 4\text{V}$ Differential Output or 0.5V to 4.5V Single Ended Output
- Responds to both DC and AC Acceleration (0 to 1750+ Hz)
- Low Impedance Outputs Support up to 2000 Feet of Cable
- Integrated Cable or Connector, Traditional & Small Footprint Sizes
- Simple Four (4) Wire Connection
- Rugged Anodized Aluminum Case
- Fully Calibrated and Serialized for Traceability

AVAILABLE G-RANGES

FULL SCALE ACCELERATION	MODEL SUFFIX
$\pm 2 \text{ g}$	-002
$\pm 5 \text{ g}$	-005
$\pm 10 \text{ g}$	-010
$\pm 25 \text{ g}$	-025
$\pm 50 \text{ g}$	-050
$\pm 100 \text{ g}$	-100
$\pm 200 \text{ g}$	-200



The SDI Models 2220 and 2276 Single Axis MEMS Variable Capacitive Accelerometers from Silicon Designs are low-cost, high performance integrated plug-and-play measurement devices for demanding applications.

Upgraded accelerometers reduce the bias and scale factor temperature shift specifications and support greater temperatures, functioning from -55 to +125°C. The 2220 comes in a traditional 1-inch square package with an integrated cable and is operationally identical to the 2276, the small footprint device for tight spaces. They are both suitable for zero-to-medium frequency commercial and industrial applications, and particularly where reliable performance, extremely low noise, and long-term stability are absolute requirements.



Each SDI single axis accelerometer module features a hermetically sealed low noise accelerometer within a rugged, epoxy sealed, anodized aluminum case. Onboard voltage regulation and an internal voltage reference eliminate the need for precision power supplies. They are relatively insensitive to temperature changes and gradients. The case is easily mounted via two screws, an adhesive, or by attaching a magnet.

ZERO (DC) TO MEDIUM FREQUENCY APPLICATIONS



PERFORMANCE BY G RANGE

INPUT RANGE	FREQUENCY RESPONSE (MINIMUM, 3 DB)	SENSITIVITY, DIFFERENTIAL	OUTPUT NOISE, DIFFERENTIAL (RMS, TYPICAL)	MAX. MECHANICAL SHOCK (0.1 MS)
g	Hz	mV/g	$\mu\text{g}/(\text{root Hz})$	g (peak)
± 2	0 – 300	2000	10	2000
± 5	0 – 400	800	15	
± 10	0 – 600	400	23	
± 25	0 – 900	160	38	
± 50	0 – 1200	80	60	5000
± 100	0 – 1400	40	121	
± 200	0 – 1750	20	243	

$V_{DD}=V_R=5.0 \text{ VDC}, T_C=25^\circ\text{C}$

Single ended sensitivity is half of values shown.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

PERFORMANCE - ALL VERSIONS

All Models: Unless otherwise specified, Vs=+8 to +32 VDC, TC=25°C, Differential Mode. Span = ±g range = 8000 mV.

PARAMETER	MIN	TYP	MAX	UNITS
Bias Calibration Error		0.25	0.9	± % of span
Bias Temperature Shift (T _c = -55 to +125°C)	-100	0	+100	(PPM of span)/°C
Scale Factor Calibration Error ¹		0.5	1.25	± %
Scale Factor Temperature Shift (T _c = -55 to +125°C)	-150	0	+50	PPM/°C
Non-Linearity (-90 to +90% of span) ¹		0.15	0.5	± % of span
Cross Axis Sensitivity		2	3	± %
Power Supply Rejection Ratio	50	>65		dB
Output Impedance		1		Ω
Output Common Mode Voltage		2.5		VDC
Operating Voltage	8		32	VDC
Operating Current (AOP & AON open)		7	10.5	mA DC
Mass 2220 / 2276 (not including cable)		10 / 9		grams
Cable Mass (3' integrated cable, 2220)		14		grams/meter

Note 1: For 2g thru 50g only; 100g and greater versions are tested and specified from -65 to +65g.

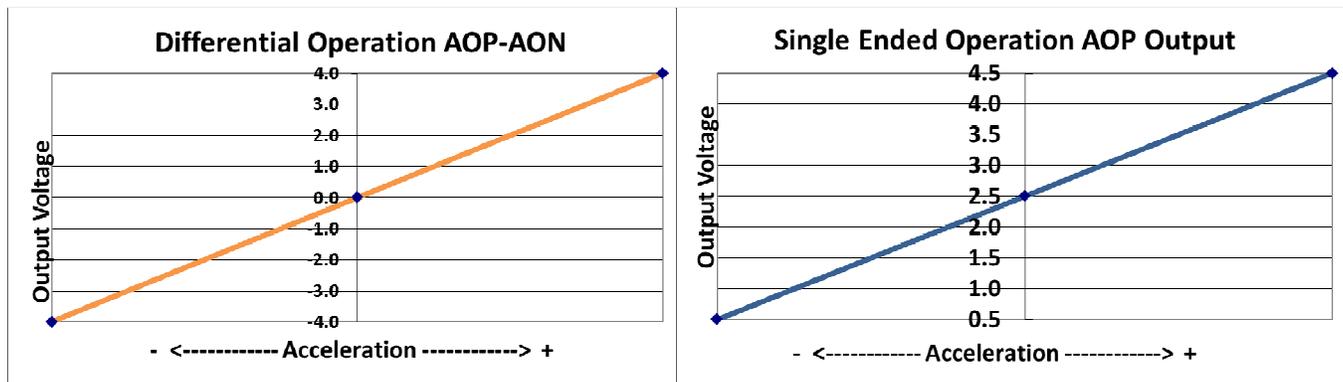
NOTICE: Stresses greater than those listed may cause permanent damage to the device. These are maximum stress ratings only. Functional operation of the device at or above these conditions is not implied.

OPERATION

SDI's Models 2220 and 2276 MEMS Variable Capacitive Accelerometers provide optimal performance when they are connected to instrumentation in a differential configuration using both the AOP and AON output signals, but they also support single ended operation for complete flexibility.

These Accelerometers produce differential analog output voltage pairs (AON & AOP) which vary with acceleration. The signal outputs are fully differential about a common mode voltage of approximately 2.5 volts. At zero acceleration, the output differential voltage is nominally 0 volts DC; at ±full scale acceleration, the output is ±4 volts DC, respectively, as shown in the figure (below). The output scale factor is independent from the supply voltage of +8 to +32 volts.

When a differential connection is not possible, SDI recommends connecting the accelerometer to instrumentation in single ended mode by **connecting AOP and GND** to the instrumentation and **leaving AON disconnected**. Keep in mind that the signal to noise ratio is reduced by half for a single-ended vs. a differential connection.



SIGNALS & CABLE SPECIFICATIONS

2220: The standard 3' integrated cable consists of four 28 AWG (7x36) tin plated copper wires with Teflon FEP insulation surrounded by a 40 AWG tin plated copper braided shield. The shield jacket is Teflon FEP with a nominal outer diameter of 0.096". The cable's braided shield is electrically connected to the case. The black ground (GND) wire is isolated from the case.

2276: The case's integrated connector shells, pins and sockets are gold plated brass. The 4PIN-CAB cable consists of four 30 AWG (7x38) silver-plated copper wires with PTFE insulation surrounded by a braided shield. The black FEP shield jacket has a nominal outer diameter of 0.100".

Both cable styles end in a 4-wire pigtail (shown below).



WIRE	SIGNAL
VS: red wire	Power
GND: black wire	Ground
AOP: (Output) green wire	Positive output
AON: (Output) white wire	Negative output



2276 STANDARD CABLE LENGTHS



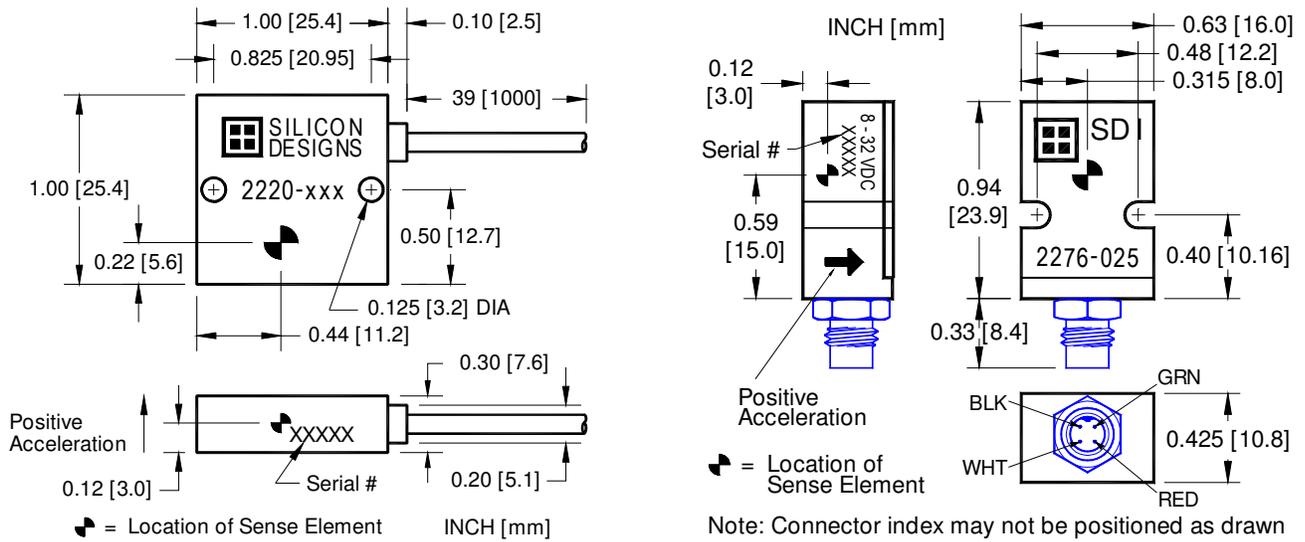
The 4PIN-CAB is available in four standard lengths, and custom lengths may be available for special order.

NAME	LENGTH - FEET	LENGTH - METERS (APPROXIMATE)
4PIN-CAB-04	4 Feet	1.2 Meters
4PIN-CAB-14	14 Feet	4.4 Meters
4PIN-CAB-33	33 Feet	10 Meters
4PIN-CAB-50	50 Feet	15.4 Meters

CABLE LENGTH CONSIDERATIONS

Cable lengths of up to 15 meters (50 feet) can be used without the need to test for output instability. For cable lengths exceeding 15 meters, Silicon Designs recommends checking each individual installation for oscillation by tapping the accelerometer and watching the differential output for oscillation in the 20 kHz to 50 kHz region. If no oscillation is present, extended cable length should behave as expected. From the standpoint of output current drive and slew rate limitations, all SDI Universal Accelerometers are capable of driving over 600 meters (2000 feet) of cable. However, at some length ranging between 15 and 600 meters, each device will likely begin to exhibit oscillation.

PACKAGE DIMENSIONS



ALTERNATIVE MODELS



The SDI Models 2210, 2260 and 2266 offer a cost savings for applications that still need SDI's excellent performance but operate in less demanding environments from -40 to +85°C. The 2210 comes in a traditional 1-inch square package with an integrated cable and is operationally identical to the 2260 and 2266, the small footprint options for tight spaces.



The high performance SDI Models 2470 and 2476 are the three axis versions of the 2220 and 2276, with upgraded bias and scale factor temperature shift specifications and a wider temperature range from -55 to +125°C.



The SDI Models 2460 and 2466 are the externally identical low-cost versions of the 2470 and 2476, respectively, rounding out the SDI Universal Module family for lower-temperature applications from -40 to +85°C.



Data sheets dated 1-November-2015 and newer apply to 2220's with serial numbers above 23532 and 2276's with serial numbers above 1000. Contact SDI for prior data sheets pertaining to parts made prior to these.

ERROR: stackunderflow
OFFENDING COMMAND: ~

STACK: