SILICON DESIGNS INC
ADVANCED ACCELEROMETER SOLUTIONS

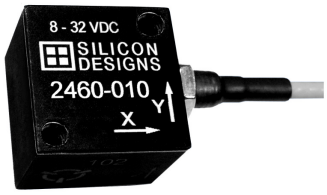
LOW COST MODELS 2460 & 2466
TRIAXIAL DC ACCELEROMETER MODULES

- **Low Noise: 10 µg/√Hz Typical for ±2g Full Scale Versions**
- **-40 to +85°C Operating Temperature Range**
- **Acceleration and Vibration Sensing Across Three Orthogonal Axes**
- Excellent Long Term Stability
- Flexible +8 to +32 VDC Power
- ±4V Differential Output or 0.5V to 4.5V Single Ended Output
- Responds to both DC and AC Acceleration (0 to 2000+ Hz)
- Low Impedance Outputs Support up to 2000 Feet of Cable
- Choice of Integrated Cable or Connector
- Simple Eight (8) Wire Connection
- Rugged Anodized Aluminum Case
- Fully Calibrated and Serialized for Traceability

AVAILABLE G-RANGES

FULL SCALE ACCELERATION	MODEL SUFFIX
± 2 g	-002
± 5 g	-005
± 10 g	-010
± 25 g	-025
± 50 g	-050
± 100 g	-100
± 200 g	-200
± 400 g	-400

Models 2460 and 2466 Triaxial MEMS Variable Capacitive Accelerometers from Silicon Designs (SDI) are low-cost, integrated plug-and-play measurement devices. They are 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 triaxial accelerometer features three orthogonally mounted low noise accelerometers within a single, 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. Individual axis directions are marked on the case with positive acceleration defined as acceleration in the direction of the axis arrow. The case is easily mounted via two screws, an adhesive, or by attaching a magnet.

ZERO (DC) TO MEDIUM FREQUENCY APPLICATIONS

ROBOTICS SEISMIC TILT VIBRATION AUTOMOTIVE IMPACT INSTRUMENTATION MONITOR OEM

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	µg/(root Hz)	g (peak)
±2	0 – 300	2000	10	2000
±5	0 – 400	800	15	
±10	0 – 600	400	23	5000
±25	0 – 900	160	38	
±50	0 – 1200	80	60	
±100	0 – 1400	40	121	
±200	0 – 1750	20	243	
±400	0 – 2000	10	475	

V_{DD}=V_R=5.0 VDC, T_C=25 ℃ *Single ended sensitivity is half of values shown.*

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= -40 to +85°C)	-200	0	+200	(PPM of span)/°C
Scale Factor Calibration Error [1]		0.5	1.25	± %
Scale Factor Temperature Shift (T_C= -40 to +85°C)	-200	0	+200	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)	19	23	27	mA DC
Mass (not including cable)		21		grams
Cable Mass (3' integrated cable, 2460)		25		grams/meter

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

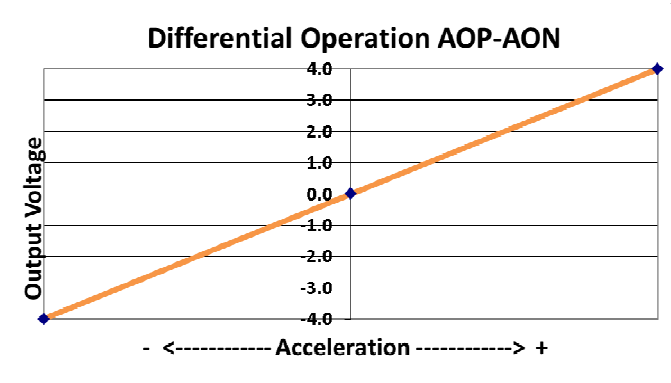
NOTICE: *Stresses greater than those listed may cause permanent damage to the device. These are maximum stress ratings only. Functional operation of the device at or above these conditions is not implied.*

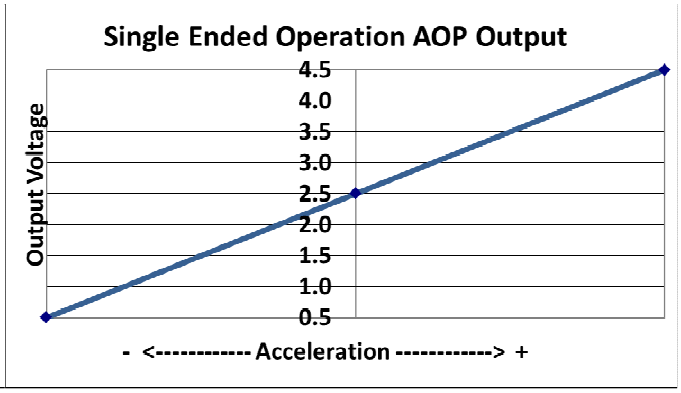
OPERATION

SDI 2460 and 2466 Triaxial 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 still support single ended operation for complete flexibility.

These Accelerometers produce three 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

2460: The SDI 2460 has an integrated 1-meter (approx. 3 feet) cable with strain relief attached at the connection to the case and consists of seven 28 AWG (7x36) and one 26 AWG (7x34) tin-plated copper wires. The seven smaller 28 AWG wires are covered by 5.5 mils of Teflon FEP insulation. The large single 26 AWG wire is covered by 8.5 mils of black Teflon FEP insulation. The seven smaller gauge wires surround the single larger gauge (black) wire. The cable's braided shield is electrically connected to the case. The black ground (GND) wire is isolated from the case. The wire bundle is surrounded by a braided shield and covered by a 10 mil thick Teflon FEP jacket with a nominal outer diameter of 0.136".

2466: The SDI 2466 has a 9-pin connector; the 8PIN-CAB cable consists of eight 26 AWG tin-plated copper wires and only eight pins are used for the 8-wire cable. All eight of the 26 AWG wires are covered by 8.5 mils of Teflon insulation.

Both cable styles end in an 8-wire pigtail (shown below).

WIRE	SIGNAL
VS: red wire	Power
GND: black wire	Ground
AOPX: (Output) green wire	X-Axis positive output
AONX: (Output) white wire	X-Axis negative output
AOPY: (Output) brown wire	Y-Axis positive output
AONY: (Output) orange wire	Y-Axis negative output
AOPZ: (Output) blue wire	Z-Axis positive output
AONZ: (Output) yellow wire	Z-Axis negative output

2466 STANDARD CABLE LENGTHS

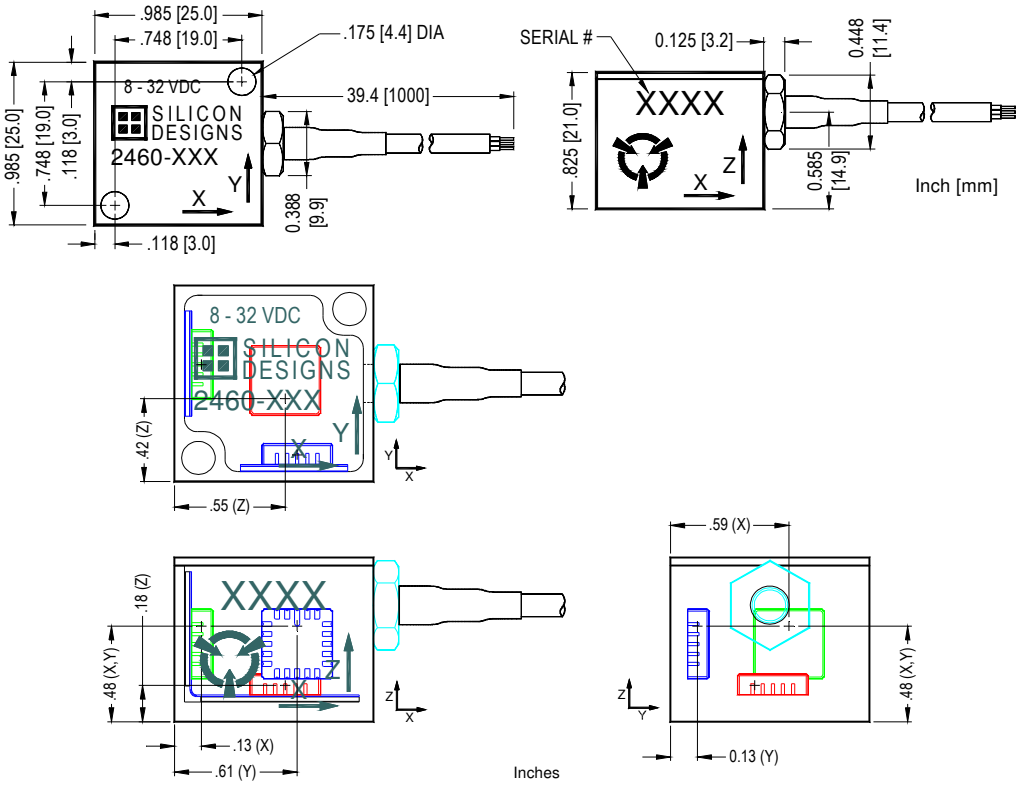
The 8PIN-CAB is available in five standard lengths, and custom lengths may be available for special order.

NAME	LENGTH - FEET	LENGTH - METERS (APPROXIMATE)
8PIN-CAB-04	4 Feet	1.2 Meters
8PIN-CAB-10	10 Feet	3 Meters
8PIN-CAB-20	20 Feet	6 Meters
8PIN-CAB-33	33 Feet	10 Meters
8PIN-CAB-50	50 Feet	15.4 Meters

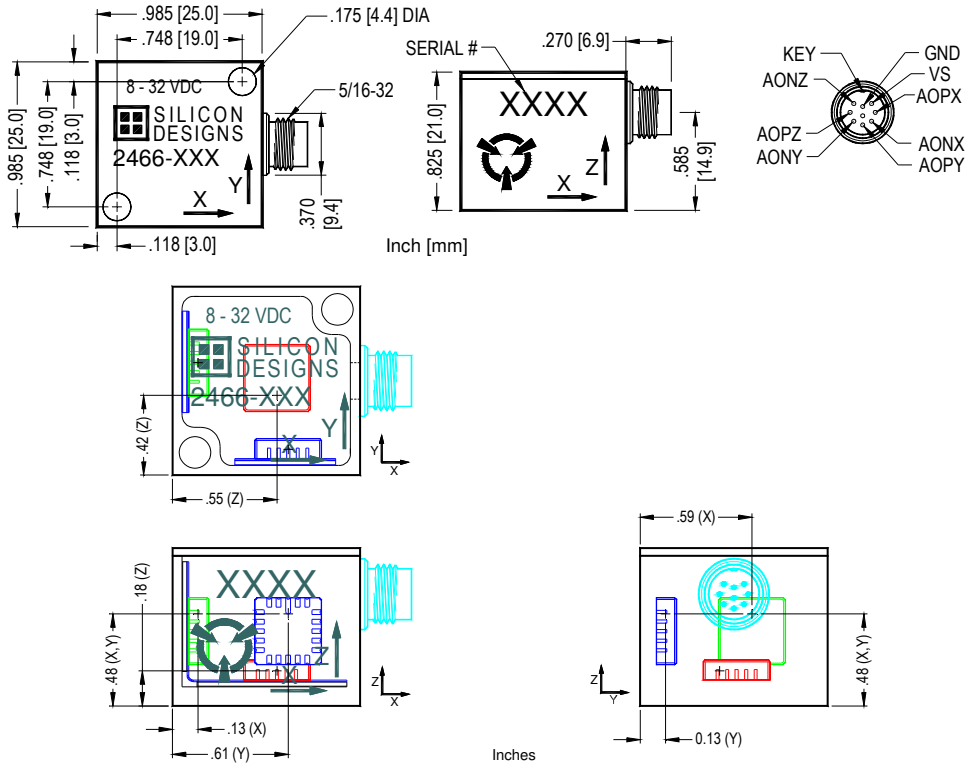
CABLE LENGTH CONSIDERATIONS

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.

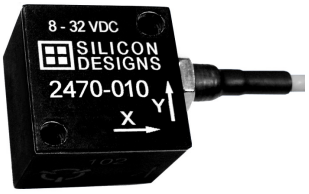
2460 DIMENSIONS



2466 DIMENSIONS



ALTERNATIVE MODELS

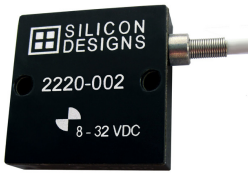


The SDI Models 2470 and 2476 are the high performance versions of the 2460 and 2466, respectively. The SDI Models 2470 and 2476 contain upgraded SDI accelerometer chips that improve bias and scale factor temperature shift performance and support a wider temperature range from -55 to +125°C.

The SDI Models 2210, 2220, 2260, 2266, and 2276 Single Axis MEMS Variable Capacitive Accelerometers are SDI's 1-Axis versions of the triaxial models.

The SDI Models 2210, 2260 and 2266 offer a cost savings for applications that still need SDI's excellent performance but have less demanding environments from -40 to +85°C.

The SDI Models 2220 and 2276 are the high-performance versions of the 2210 and 2266, respectively. The 2220 and 2276 have the same upgraded SDI accelerometer chip inside as the 2470 and 2476, similarly reducing the bias and scale factor temperature shift specifications and supporting greater temperatures from -55 to +125°C.



Data sheets dated 1-November-2015 and newer apply to 2460/2466 with serial numbers above 2000. Contact SDI for prior data sheets pertaining to parts with serial number below 2000.