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Model 2276

Analog Accelerometer Module

- Capacitive Micromachined
- Nitrogen Damped
- ±4V Differential Output or 0.5V to 4.5V Single Ended Output
- Fully Calibrated
- Low Power Consumption
- +8 to +32V DC Power
- -55 to +125°C
- Simple Four Wire Screw-on Removable Connector
- Responds to DC and AC Acceleration
- Low Noise
- Serialized for Traceability
- Low Impedance Outputs Will Drive Up To 15 Meters of Cable

Available G-Ranges

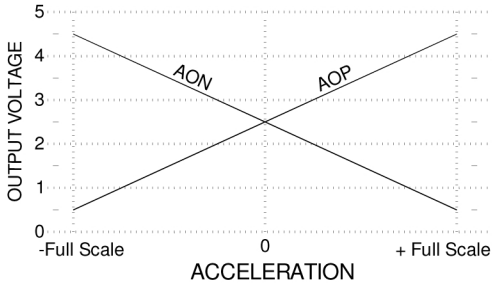
Full Scale Acceleration	Model Number
± 2 g	2276-002
± 5 g	2276-005
± 10 g	2276-010
± 25 g	2276-025
± 50 g	2276-050
±100 g	2276-100
±200 g	2276-200

DESCRIPTION

The model 2276 accelerometer is a higher performance and wider temperature range version of the 2266 module and combines an integrated model 1221L accelerometer with high drive, low impedance buffering for measuring acceleration in commercial/industrial environments. It is tailored for zero to medium frequency instrumentation applications. The anodized aluminum case is epoxy sealed and is easily mounted via two #4 (or M3) screws. On-board regulation is provided to minimize the effects of supply voltage variation. It is relatively insensitive to temperature changes and gradients. A removable cable 2276-CAB attaches via a 4-pin connector. An optional initial calibration sheet (2276-CAL) and periodic calibration checking are also available.

OPERATION

The Model 2276 accelerometer module produces two analog voltage outputs, which vary with acceleration as shown in the graph on the next page. The sensitive axis is perpendicular to the bottom of the package, with positive acceleration defined as a force pushing on the bottom of the package. The signal outputs are fully differential about a common mode voltage of approximately 2.5 volts. The output scale factor is independent from the supply voltage of +8 to +32 volts. At zero acceleration the output differential voltage is nominally 0 volts DC; at ±full scale acceleration the output differential voltage is ±4 volts DC respectively.



APPLICATIONS

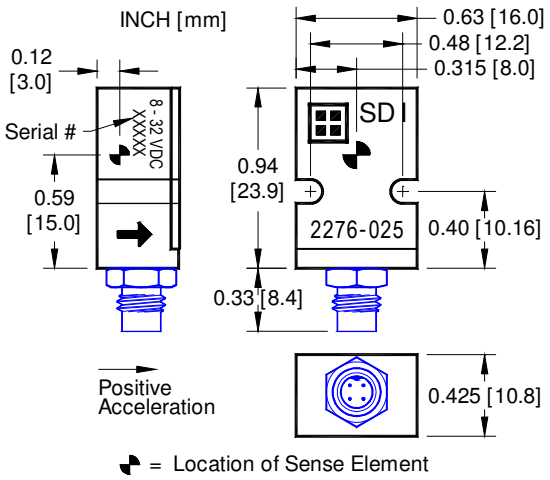
- FLIGHT TESTS
- VIBRATION MONITORING
- VIBRATION ANALYSIS
- MACHINE CONTROL
- MODAL ANALYSIS
- ROBOTICS
- CRASH TESTING
- INSTRUMENTATION

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SIGNAL DESCRIPTIONS

Vs and GND (Power): Red and Black wires respectively. Power (+8 to +32 Volts DC) and ground.

AOP and AON (Output): Green and White wires respectively. Analog output voltages proportional to acceleration; AOP voltage increases (AON decreases) with positive acceleration. At zero acceleration both outputs are nominally equal to 2.5 volts. The device experiences positive (+1g) acceleration with its lid facing up in the Earth's gravitational field. Either output can be used individually or the two outputs can be used differentially (see output response plot).



PERFORMANCE - By Model: V_S=+8 to +32VDC, T_C=25°C

MODEL NUMBER	2276-002	2276-005	2276-010	2276-025	2276-050	2276-100	2276-200	UNITS
Input Range	±2	±5	±10	±25	±50	±100	±200	g
Frequency Response (Nominal, 3 dB) [1]	0 - 400	0 - 600	0 - 1000	0 - 1500	0 - 2000	0 – 2500	0 - 3000	Hz
Sensitivity, Differential [2]	2000	800	400	160	80	40	20	mV/g
Output Noise, Differential (RMS, typical)	12	14	15	38	75	150	300	µg/(root Hz)
Max. Mechanical Shock (0.1 ms)	2000							g

Note 1: 250Hz ±100Hz, -3dB bandwidth, optionally available.
Note 2: Single ended sensitivity is half of values shown.

PERFORMANCE - All Models: Unless otherwise specified, Vs=+8 to +32VDC, T_C=25°C, Differential Mode.

PARAMETER		MIN	TYP	MAX	UNITS
Cross Axis Sensitivity			1	2	%
Bias Calibration Error	-002			4.0	% of span
	-005 thru -200			1.5	
Bias Temperature Shift (T_C= -40 to +80°C)	-002 & -005		100	200	(ppm of span)/°C
	-010 thru -200		50	100	
Scale Factor Calibration Error [3]			1	2	%
Scale Factor Temperature Shift (T_C= -40 to +80°C)	-002 & -010	-250		+150	ppm/°C
	-025 thru -200	-150			
Non-Linearity (-90 to +90% of Full Scale) [3, 4]	-002 thru -050		0.15	0.5	% of span
	-100		0.25	1.0	
	-200		0.40	1.5	
Power Supply Rejection Ratio		50	>65		dB
Output Impedance			1		Ω
Output Common Mode Voltage			2.5		VDC
Operating Voltage (reduce max by 0.24V/°C above 100°C)		8		32	VDC
Operating Current (AOP & AON open)			9	12	mA DC
Mass (not including cable)			8		grams
Cable and Connector Mass			14		grams/meter

Note 3: 100g versions and above are tested from -65g to +65g.
Note 4: Tighter tolerances may be available upon request.

DIFFERENTIAL vs SINGLE ENDED OPERATION

The model 2276 accelerometer will provide its best performance when you connect it to your instrumentation in a differential configuration using both the **AOP** and **AON** output signals. But a differential connection may not always be possible. In such cases, it is perfectly fine to connect the accelerometer to your instrumentation in single ended mode by connecting **AOP** and **GND** to your 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.

CABLE SPECIFICATIONS & LENGTH CONSIDERATIONS

The connector shells, pins and sockets are gold plated brass. The 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". Cable lengths of up to 50 feet (15 meters) can be used without the need to test for output instability. For lengths longer than 50 feet, we recommend you check each individual installation for oscillation by tapping the accelerometer and watching the differential output for oscillation in the 20kHz to 50kHz region. If no oscillation is present then the cable length being used is OK. From the standpoint of output current drive and slew rate limitations, the model 2240 is capable of driving over 2000 feet (600 meters) of its cable type but at some length between 50 and 2000 feet, each device will likely begin to exhibit oscillation.