



# **Know Your Motion**

## Measure it easily and accurately with an Endevco 6DoF sensor

The Model 7360A is a six degrees of freedom (6DoF) sensor that provides analog output for three axes of linear acceleration and three axes of angular rate in a compact, roughly one inch cube package. A sensor with analog output offers the advantage of being able to troubleshoot the data to its source and examine the output compared to its time history. As opposed to inertial measurement units (IMU's) where the information has been digested and presented in a take-it-or-leave-it fashion, which is not user-friendly in a test and measurement or R&D environment.

In typical dynamic measurements, acceleration and angular rate data are essential parameters needed to fully characterize the complex behavior of a moving object. Until recently, engineers can only conveniently gather information using linear accelerometers because the massive array of sensors required to collect rotational data was impractical due to the expense and space required. With this new 6DoF sensor, professionals in automotive and aircraft development are now able to measure linear and rotational dynamics that previously required multiple sensors and much more space. Rather than having to make assumptions about these dynamic interactions, the 7360A provides reliable, empirical data to support the analytical results. In addition, the close proximity of all the CSM's (centers of seismic mass) allows for superior approximation of the vehicle/body dynamics. What makes the 7360A truly unique is that it offers low acceleration ranges and low angular rate ranges most suitable for accurately characterizing motion.



#### **APPLICATIONS**

- Vehicle dynamics
- Aircraft flight testing
- Spacecraft and satellite
- Missile testing
- Automotive rollover

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Piezoelectric accelerometers | Piezoresistive accelerometers | IEPE accelerometers | Variable capacitance accelerometers | Piezoresistive pressure sensors | Piezoelectric pressure sensors | High intensity microphones | Inertial sensors | Signal conditioners and supportive instrumentation | Cable assemblies

### Accelerometers for motion and vibration measurements



7360A				ର୍	1.20 [30.5]	ø	
Description	Six degrees o Compact pac Option M1 for	of freedom sensor kage with 2 cables - 5V		<b>≺</b>		/ ⊕ /	
Shock limit g	5000				SENSO		
<b>Operating temperature</b> °C (°F)	-40 to +100 (-	40 to +212)				TT	
Dimensions mm (in)	30.5 x 30.5 x 2	27.9 (1.2 x 1.2 x 1.1)			1		
Weight grams (without cables)	35				12 X 1	.28 .22 32.5	
Cable type	2 cables, 12x braided shield	#30AWG Cond PFA d, PU jacket	insulated,			1.0]	
Humidity	IP67			RATE SENSOR CABLE			
Accelerometer excitation voltage Vdc	7 to 36 or 5V	(M1 option)		EXC RED +OUT GRN -OUT WHT	BRN ORG BLU GRY YEL VIO	PATE	
Rate excitation voltage $Vdc$	5 to 16			GND BLK	BLK BLK	· · ·	
Mounting method	4-40 screws			INCHES [MILLIMETERS] .XX = ± .02 [X = ± .5] .XXX = ± .010 [.XX = ± .25]			
Accelerometer			-2	-10	-50	-2	
Range		g	±2	±10	±50	±	
Sensitivity		mV/g	1000	200	40	1	
(tolerance)		mV/g	±50	±10	±2	<u>+</u>	
Frequency response			0.000	0.4500	0.4000	0	
$(\pm 10B, ref 100 Hz) max$		HZ	0-300	0-1500	0-1800	0	
(±30B, ref 100 Hz) typical		HZ	0-550	0-2500	0-2800	0	
Transverse consitivity (typical)		0/	<u>7</u> 0	3 0 ∓20	<u>7</u> 0	3	
Thermal zero shift (max)		%ESO	+20	+20	+20	+	
-40°C to +100°C (-40°E to +212	°F)	/01 50	=2.0	=2.0	=2.0	_	
Thermal sens shift (max) -40°C to +100°C (-40°F to +212	°F)	%	±2.0	±2.0	±2.0	±	
Combined non-linearity and hystere	esis (typical)	%FSO	±0.5	±0.5	±0.5	±	
Threshold (resolution) [2]		equiv. g's	.0002	.001	.005	.(	
Angular rate sensor			-100	-500	-1K5	-8	
Range		deg/sec	±100	±500	±1500	±	
Sensitivity (±15%)		mV/deg/sec	20	4	1.333	0	
Frequency response							
(+1dB/-3dB, ref 100 Hz)		Hz	0-1000	0-1000	0-1000	0	
Cross axis sensitivity		%	<1	<1	<1		
I hermal zero shift (max) $40^{\circ}$ C to $\pm 105^{\circ}$ C ( $40^{\circ}$ E to $\pm 221$	°E)	%FSO	±2.5	±2.5	±2.5		



+2 1000 ±50 0-300 0-550 ±50 3.0	±10 200 ±10 0-1500 0-2500 ±50 3.0	±50 40 ±2 0-1800 0-2800 ±50	±200 10 ±1.0 0-1800 0-5000	±500 4 ±0.3 0-1800 0-5000	
1000 ±50 0-300 0-550 ±50 3.0	200 ±10 0-1500 0-2500 ±50 3.0	40 ±2 0-1800 0-2800 ±50	10 ±1.0 0-1800 0-5000	4 ±0.3 0-1800 0-5000	
±50 0-300 0-550 ±50 3.0	±10 0-1500 0-2500 ±50 3.0	±2 0-1800 0-2800 ±50	±1.0 0-1800 0-5000	±0.3 0-1800 0-5000	
0-300 0-550 ±50 3.0	0-1500 0-2500 ±50 3.0	0-1800 0-2800 ±50	0-1800 0-5000	0-1800 0-5000	
0-300 0-550 ±50 3.0	0-1500 0-2500 ±50 3.0	0-1800 0-2800 ±50	0-1800 0-5000	0-1800 0-5000	
0-550 ±50 3.0	0-2500 ±50 3.0	0-2800 ±50	0-5000	0-5000	
±50 3.0	±50	±50			
3.0	3.0		±50	±50	
	5.0	3.0	3.0	3.0	
±2.0	±2.0	±2.0	±2.0	±2.0	
±2.0	±2.0	±2.0	±2.0	±2.0	
±0.5	±0.5	±0.5	±0.5	±1	
.0002	.001	.005	.02	.05	
-100	-500	-1K5	-8K	-12K	-18K
±100	±500	±1500	±8000	±12000	±18000
ec 20	4	1.333	0.25	0.167	0.111
0-1000	0-1000	0-1000	0-1000	0-2000	0-2000
<1	<1	<1	<1	<1	<1
±2.5	±2.5	±2.5	±2.5	±2.5	±2.5
±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
±100	±100	±100	±100	±100	±100
±0.5	±0.5	±0.5	±0.5	±0.5	±0.5
3.4	3.2	2.5	2.1	1.8	1.8
	$\begin{array}{c} \pm 2.0 \\ \pm 2.0 \\ \pm 0.5 \\ .0002 \\ \hline -100 \\ \pm 100 \\ 20 \\ 0 \\ 0 \\ -1000 \\ <1 \\ \pm 2.5 \\ \pm 2.0 \\ \pm 100 \\ \pm 0.5 \\ 3.4 \end{array}$	$\begin{array}{cccc} \pm 2.0 & \pm 2.0 \\ \pm 2.0 & \pm 2.0 \\ \pm 2.0 & \pm 2.0 \\ \pm 0.5 & \pm 0.5 \\ .0002 & .001 \\ \hline \end{array}$ ec $\begin{array}{cccc} -100 & -500 \\ \pm 100 & \pm 500 \\ 20 & 4 \\ \hline \end{array}$ $\begin{array}{ccccc} 01000 & 01000 \\ <1 & <1 \\ \pm 2.5 & \pm 2.5 \\ \pm 2.0 & \pm 2.0 \\ \pm 100 & \pm 100 \\ \pm 0.5 & \pm 0.5 \\ 3.4 & 3.2 \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

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