

MotionPak® II

Applications

- Vehicle Instrumentation
- Robotics
- Remotely Piloted Vehicles
- Attitude Reference Systems
- Industrial Control Systems
- Navigation Aiding GPS
- Marine Instrumentation
- Flight Testing



Description

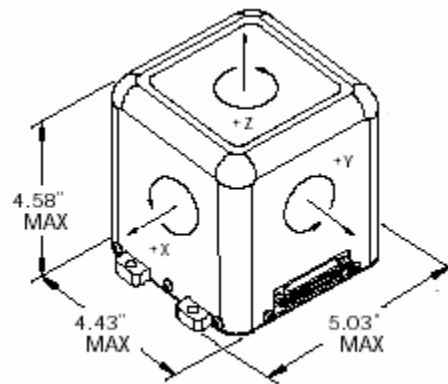
The MotionPak® II is a “solid-state” MEMS six degree of freedom inertial sensing system used for measuring linear accelerations and angular rates in instrumentation and control applications. It is a highly reliable, compact, and rugged package providing both analog and digital (RS-232) outputs. With three orthogonally mounted micromachined quartz angular rate sensors and three silicon based accelerometers, the MotionPak II is a fully self-contained motion measurement package utilizing internal power regulation and signal conditioning electronics.

Key Performance Features

- “Solid-State” Sensors
- Dual Level Analog Outputs
- RS-232 Digital Output
- Single Supply Feature
- Compact, Rugged Package
- Wide Bandwidth
- Long Operating Life
- Fast Start-Up
- Low Cost
- Fully Self-Contained System



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	STANDARD OUTPUTS		SINGLE SUPPLY FEATURE	
	(High, low & RS-232 outputs)		(Low Output & RS-232 only)	
Input Power	Dual Supply (bipolar)		Single supply	
Input Voltage	+ and - 15 Vdc \pm 1 Vdc		+ 11.0 Vdc +16.0 Vdc	
Input Current	Plus Supply <125 milliampere Minus Supply <35 milliampere		<125 milliampere	
Performance	Rate Channels	Accelerometer Channels	Rate Channels	Accelerometer Channels
Standard ranges	$\pm 75^\circ/\text{sec}$	$\pm 3.0\text{g}$	$\pm 75^\circ/\text{sec}$	$\pm 1.5\text{g}$
Full Scale HIGH Analog Output	$\pm 10\text{ Vdc}$	$\pm 10\text{ Vdc}$	--	--
Full Scale LOW Analog Output	+0.5/+4.5 Vdc	+0.5/+4.5 Vdc	+0.5/+4.5 Vdc	+0.5/+4.5 Vdc
Scale Factor HIGH-nominal	0.133 V/ $^\circ/\text{sec}$	3.33 V/g	--	--
Scale Factor LOW-nominal	0.027 V/ $^\circ/\text{V/g}$	0.75 V/g	0.027 V/ $^\circ/\text{sec}$	1.2 V/g
Sensitivity (Error) -40 to +85°C	$\pm 6\%$ (1)	$\pm 5\%$	$\pm 6\%$ (1)	$\pm 5\%$
Offset HIGH-nominal	0 Vdc	0 Vdc	--	--
Offset low-NOMINAL	2.5 Vdc	2.5 Vdc	2.5 Vdc	2.5 Vdc
Offset (-40 to +85°C)	$\pm 5.0^\circ/\text{sec}$ (2)	$\pm 125\text{ mg}$	$\pm 5.0^\circ/\text{sec}$	$\pm 125\text{ mg}$
Output noise High Analog	28 mV RMS	28 mV RMS	--	--
Output noise Low Analog	6 mV RMS	5 mV RMS	6 mV RMS	5 mV RMS
Start-up time	1.0-Second	1.0 Second	1.0 Second	1.0 Second
Bandwidth	DC to >30 Hz	DC to >250 Hz	>30 Hz	DC to > 250 Hz
Non-linearity	<3%	$\pm 40\text{ mg}$	<3%	$\pm 40\text{ mg}$
Environments				
Operating temperature	-40 TO +85°C		-40 TO +85°C	
Storage temperature	-40 TO +85°C		-40 TO +85°C	
Vibration survival	4 g RMS (20 – 2 KHz)		4 g RMS (20 – 2 KHz)	
Shock	200 g PK 2 mSec $\frac{1}{2}$ sine pulse		200 g PK 2 mSec $\frac{1}{2}$ sine pulse	
(1) Sum of 3% Set and 3% Linearity, worst case				
(2) Sum of 1.8 $^\circ/\text{sec}$ Set and 3.2 $^\circ/\text{sec}$ TC, worst case				
RS-232 Feature				
	Data Transfer Rate 32 Hz maximum (measuring 7 "12 BIT" WORDS)			
	LSB = 1.2 millivolt (Least Significant BIT)			
Temperature Sensor				
	10 millivolt/ $^\circ\text{K}$	-40°C (233.15°K) = 2.33 Vdc	+85°C (358.15°K) = 3.58 Vdc	

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