Accelerometer

INNALABS® AL-15M2.5 Accelerometer

Datasheet

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The **Innalabs® AL-15M2.5 Accelerometer (AL-15M2.5)** is designed as a closed-loop pendulous accelerometer with a metallic sensing element (SE), a differential photo-optic displacement sensor (DS) of the SE, and a magneto-electric reverse compensational transducer (RCT).

FEATURES

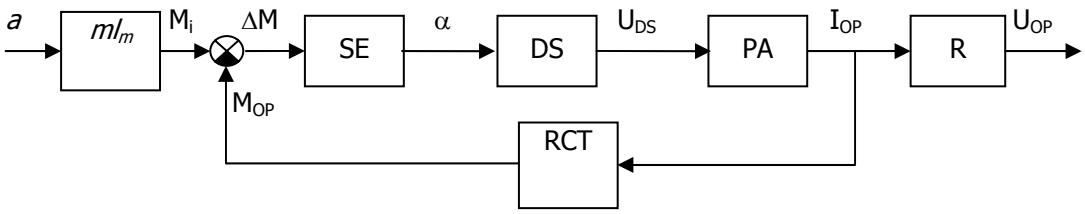
- Navigation grade performance
- Excellent turn-on repeatability and stability performance
- Environmentally rugged
- Analog output
- Internal temperature sensor for thermal compensation
- Compact Design

APPLICATIONS

- Aircraft
- Helicopters
- UAVs
- Missiles
- Marine
- Tilt sensing
- Industrial
- Rail

The AL-15M2.5 makes use of a metallic (bronze) sensing element, which provides improved shock and vibration resistance as compared to the quartz based technologies, a feature important to land vehicle applications. The output of the AL-15M2.5 is an analog voltage that is proportional to the acceleration. The zero signal adjustment capability of the differential optical angle transmitter makes it possible to reduce the bias to the minimum. Also, an internal temperature sensor makes it possible to utilize a temperature compensation algorithm to improve the AL-15M2.5 performance over a wide temperature range.

The AL-15M2.5 accelerometer structural scheme is shown in the figure below.



a – measured linear acceleration projection; $M_i=ml_ma$ – moment of inertia force;
SE – sensing element; DS – photo-optical angular displacement sensor;
PA – power amplifier; RCT – magneto-electric reverse compensational transducer;
R – load resistance, forming output voltage U_{OP}.

SPECIFICATIONS

Parameter	Unit	Value
Input range	g	±2.5
Bias	mg	< 4
One-year Composite Repeatability	µg	< 220
Temperature Sensitivity	µg/°C	< 30
Scale Factor	mA/g	1.2 … 1.5
One-year Composite Repeatability	ppm	< 500
Temperature Sensitivity	ppm/°C	< 180
Axis Misalignment	µrad	< 2000
Intrinsic Noise	µg-RMS	< 70 (10-500 Hz) < 1500 (500-10,000 Hz)
Environment		
Operating Temperature Range	deg C	−40 … +95
Shock	g	100
Vibration Peak Sine	g	10 …15 @ 20-2000 Hz
Bandwidth	Hz	300
Thermal Modeling		YES
Electrical		
Quiescent Power @ ±15 VDC	mW	< 480
Input Voltage	VDC	±15, ±28
Physical		
Weight	grams	< 75
Dimension Size (without mounting plate)	mm	36 x 26 x 27
Case Material		Stainless Steel