SUMMIT INSTRUMENTS

34103A

Precision Aligned ±1 g to ±7.5 g Tri-Axial Accelerometers with Signal Conditioning

Technical Data*

Features and Benefits

Precision Alignment
Each Axis of the 34103A is precision aligned to minimize errors due to axis misalignment or transverse sensitivity.

High Accuracy and Linearity over Wide Temperature Range
The voltage output for each axis of the 34103A is directly proportional to the acceleration along that axis. Each DC-coupled output is fully scaled, referenced, and temperature compensated. A force-balanced design improves accuracy by minimizing variations due to temperature and aging effects, resulting in a sensor that is more stable over temperature than piezoelectric or piezoresistive devices.

Calibration Certificate
Each 34103A can be supplied with an optional calibration certificate listing gain, offset, and on-axis and transverse alignment parameters needed to ensure rapid and efficient system implementation. The alignment data can be used to compensate the measured values to achieve an even higher level of sensor accuracy.

Self-Test on Digital Command
A TTL-compatible self-test input causes a simulated acceleration to be injected into all three sensors to verify channel integrity.

Small Size
Complete conditioned tri-axial accelerometer in less than a cubic inch.

Single +5 Volt Supply
A regulated +5 volt power supply is all that is required to measure accelerations on all three axes.

Suitable for Harsh Environments
The 34103A is robust and can be used in harsh environments. The unit will survive 500 g powered and 1000 g unpowered.

Precisely Measure Real-World Accelerations

The Summit Instruments 34103A accelerometer has each mutually orthogonal axis precisely aligned within 1/2 degree of the theoretical ideal. This provides the accuracy required by most linear and angular measurement applications without any compensation. Critical applications requiring higher accuracy can use the alignment data provided on the optional calibration certificate to compensate for any small residual error.

A +5 volt regulated power supply is all that is required to measure ±1 g, ±1.5 g, ±2 g, ±2.5 g, ±3 g, ±5 g, or ±7.5 g accelerations on each of three axes. Each axial sensor has been tested over the -40 to +85°C temperature range. Each axis has a nominal full scale output swing of ±2 volts. The zero g output level is nominally +2.5 volts. Precise values for each axis are available on an optional calibration certificate. Custom versions of the 34103A can be provided for applications which require different ranges and/or bandwidths.

**Data subject to change without notice*

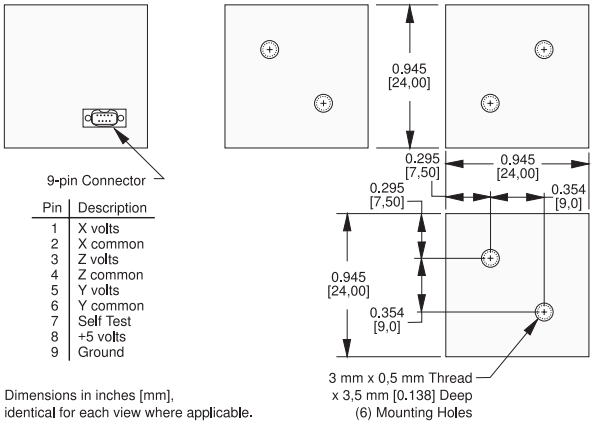
Specifications

$T_A = T_{MIN}$ to T_{MAX}, $V_S = +5$ V ±5%, Acceleration = 0 g, unless otherwise noted.

Parameter	Min	Typical	Max	Units	Conditions/Notes
Range					
Measurement Full Scale	±1		±7.5	g	On each axis. Must specify via Opt. Rnnn
Shock survival, powered	-500		+500	g	Any axis for 0.5 ms. Recovers on power cycle.
Shock survival, unpowered	-1000		+1000	g	Any axis for 0.5 ms.
Sensitivity					
At 25° C, ±5 g FSR	365†	420†	475†	mV/g	Precise values on Opt. C001 cal certificate.
Drift T_{MIN} to T_{MAX}		±0.5		%	Percent of sensitivity at 25° C
Zero G Bias Level					
At 25° C	2.1		2.9	V	Precise values on Opt. C001 cal certificate.
Drift T_{MIN} to T_{MAX}		±0.2		g	Repeatable, can be compensated.
Alignment					Precise values on Opt. C001 cal certificate.
Deviation from ideal axes		±0.15	±0.50	degrees	Can be compensated if required.
Transverse Sensitivity		0.25		%	Inherent sensor error, excluding misalignment.
Nonlinearity		0.2		% FSR	Best fit straight line.
Upper Cutoff Frequency	6.9		2500	Hz	±10% Must specify via Opt. Bnnn.
Noise					
Density		0.5	1	mg/√Hz	4 Hz to 1 kHz
Amplitude DC to 100 Hz		5		mg rms	
Self Test Input					Input impedance 50 kΩ to ground.
Logic "1" Voltage	+2.0			V	
Logic "0" Voltage			+0.8	V	
Power Supply (V_S)					Power-up stabilization in 1 ms. Power cycling
Input voltage	+4.75		+5.25	V	can be used to reduce power consumption.
Input current		25	32	mA	No load, quiescent.
Rejection Ratio	30	40		dB	DC
Outputs					
Output voltage swing	0.25		V_S - 0.25	V	I_{OUT} = ±0.1 mA
Capacitive Drive Capability	1000			pF	
Temperature Range (T_A)	-40		+85	° C	
Mass		30		g	Opt. M001 reduces typical mass to 20g

† *Scale linearly with range option Rnnn.*

Mechanical



Two 3 mm × 0.5 mm threaded holes are provided on each of three orthogonal faces for mounting.

Ordering Information

34103AK0 34103A kit with 34160A cable, 34170A adapter & tools

34103AK1 34103A kit with 34161A cable, 34170A adapter & tools

34103A Tri-axial accelerometer ±1 to ±7.5 g
(-Bnnn & -Rnnn options required)

- **-Bnnn** Bandwidth 3 dB cutoff (nnn Hz)
- **-C001** Add calibration certificate
- **-M001** Reduced Mass (requires bandwidth < 100 Hz)
- **-Rnnn** Range (nnn g FSR)
- **-W024** Extend warranty from 1 year to 2 years

34160A Shielded twisted-pair cable, 3 meter length, 9-pin female D-subminiature connector at end for user connection.

34161A Shielded twisted-pair cable, 0.3 meter length, tinned, stripped leads for user connection.

34170A Mounting adapter. Alternate mounting flange with two 3 mm tapped holes & two 0.142 [3,60] thru holes, plate dimensions: 1.417 [36,0] × 0.945 [24,0] × 0.276 [7,0].

34180A Voltage regulator, 7.5-35V input regulated to 5V output.

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