

## Digital Accelerometers User Configurable $\pm 1\text{ g}$ to $\pm 15\text{ g}$

### Technical Data\*

#### Features and Benefits

##### User Configurable Settings

The analog/digital output range and low-pass filter of each digital accelerometer axis can be set via a built-in RS-485 interface using a free, downloadable Instrument Configuration Utility (ICU). An RS-485 to RS-232 adapter is available.

##### RS-485 Serial and Analog Outputs

Calibrated, ranged and filtered data can be streamed out at up to 3 Mbit/sec via RS-485. Analog outputs are also available for compatibility with existing systems.

##### High Accuracy and Linearity over Wide Temperature Range

Accelerometer accuracy is improved by minimizing variations due to temperature and aging effects. Each axial sensor has been tested over the  $-40^\circ$  to  $+85^\circ\text{C}$  temperature range.

##### Built-in Calibration

Calibration data for each sensor is maintained in the accelerometer. All digital data output is fully calibrated and easily converted to user-configurable engineering units.

##### Self-Test

Self-test commands help verify channel integrity and wiring connections.

##### Small Size

Complete conditioned triaxial accelerometer with digital signal processing in approximately two cubic inches.

##### Built-In Power Supply Regulation

Unregulated DC power from  $+8.5$  to  $+36$  volts is all that is required to measure accelerations on all axes. Digital accelerometers are ideal for automotive applications as they survive both continuous reverse battery and load dump transients. MIL-STD-704A compatible.

##### Easy Installation with Minimal Wiring Requirements

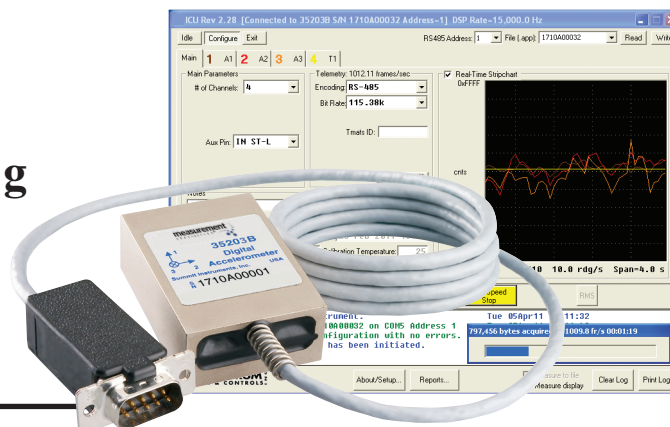
A built-in terminal block or cable with 9-pin connector simplifies wiring. Tapped holes on bottom and back simplify horizontal or vertical mounting.

##### Suitable for Harsh Environments

These accelerometers are aluminum encased, potted, and are rugged enough to be used in harsh environments.

##### Warranty

These Measurement Specialties digital accelerometers come with a three-year factory warranty.



## Inertial Measurements Made Fast and Easy

These Measurement Specialties digital accelerometers are complete, easy-to-use, user-configurable sensors containing one to three accelerometers, a temperature sensor, signal processor, RS-485 interface and three analog outputs in a small, easy-to-install package.

All channels are sampled simultaneously to avoid data skewing. The digital signal processor takes 16-bit samples, filters, ranges, and calibration compensates at up to 42,500 samples/sec/channel. Digital data can be streamed out at up to 3 Mbit/sec.

The output range, filter frequency and calibration of each channel, as well as telemetry configuration, can be set by the user via the RS-485 command processor. CRC-8 and CRC-16 error checking is used to ensure command and data integrity.

The built-in temperature sensor can be used by critical applications to correct for any residual temperature effects.

# Specifications for 15203B, 25203B and 35203B - improved specifications available upon request

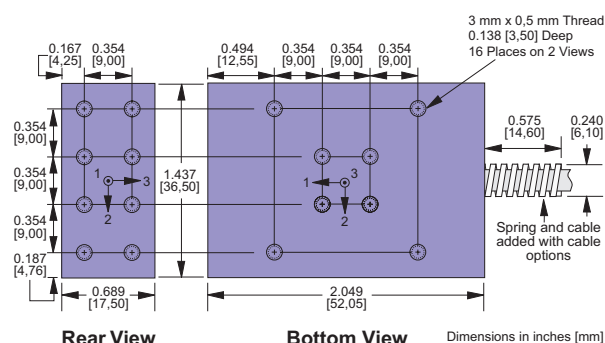
T<sub>A</sub> = T<sub>MIN</sub> to T<sub>MAX</sub>; Acceleration = 0 g unless otherwise noted; within one year of calibration.

Parameter	Min	Typical	Max	Units	Conditions/Notes
<b>Accelerometers</b> Full Scale Range Option R015 Option R006			±15 ±6	g g	On each axis. User configurable
<b>Sensitivity Drift</b> 25°C to T <sub>MIN</sub> or T <sub>MAX</sub>		±0.65		%	Percent of sensitivity at 25°C
<b>Zero g Drift</b> 25°C to T <sub>MIN</sub> or T <sub>MAX</sub>		60		mg	Repeatable, can be compensated
<b>Alignment</b>		±1.0	±3.0	degrees	Deviation from ideal axes
<b>Transverse Sensitivity</b>		0.25		%	Inherent sensor error, excluding misalignment
<b>Nonlinearity</b>		0.1		% FSR	Best fit straight line
<b>Frequency Response</b>	0†		800†	Hz	Lower filter cutoffs are user configurable
<b>Noise Density</b>		120		µg/√Hz	T <sub>A</sub> = 25°C
<b>Temperature Sensor</b> Range Resolution Accuracy	-55	0.25 ±2.0	125 ±3.5	°C °C °C	T <sub>A</sub> = -40 to 85°C
<b>Digital Signal Processor</b> Internal Word Size Sensor Scan Rate		15,000	32 42,500	bits Hz	User configurable, channels processed in parallel
<b>Analog Outputs*</b> Voltage Swing Impedance to Analog- Nonlinearity	0.25 100	130	4.75 220 0.15	V Ω % FSR	Configurable to sensor I <sub>OUT</sub> = 5 mA Excluding sensor nonlinearity
<b>Digital Output Word Size</b>			16	bits	Filtered, gained and calibration corrected
<b>Power Supply (V<sub>S</sub>)</b> Input Voltage Limits Input Voltage - Operating Input Current Rejection Ratio	-80 +8.5	50 120	+80 +36	V V mA dB	-80 V continuous, >36 V if <550 ms, duty <1% Continuous DC
<b>Temperature Range (T<sub>A</sub>)</b>	-40		85	°C	Terminal block Option T000 rated to -30°C
<b>Mass</b>		78		grams	
<b>Shock Survival</b>	-1500		+1500	g	Any axis for 0.5 ms, limited by oscillator

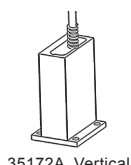
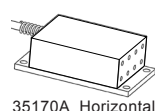
†User configurable low-pass filter 3dB cutoff (number poles configurable)

\*Each channel's offset and gain are configurable

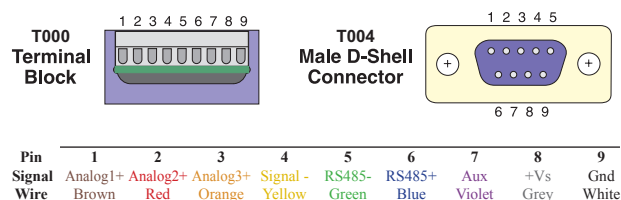
## Mechanical



Mounting  
adapters  
(sold  
separately)



## Connections



## Ordering Information

