api technologies corp.

PRELIMINARY

[Patent Pending]

XL403D

Advanced Digital Accelerometer

Built-in Analyses, Dynamic Interface, ±1 g to ±15 g

- **Built-in Analyses** reduce the need for post-processing time and equipment, plus shrink data file sizes. Simply request minimum values, maximum values, peak-to-peak, magnitude, tilt, or threshold.
- **Dynamic Customer Interface** - Set and query the XL403D with SCPI commands such as CONFigure or MEASure. Users may select the scan rates needed and set threshold detection and actions as required. Employ multiple sensors with data synchronization.
- **Flexible Output** - Readouts at specified intervals can include one, two or three axes plus temperature. Choose engineering units (g, ° C), or raw ADC counts at RS232 or RS485 baud rates.
- **High Accuracy and Linearity over Wide Temperature Range** - Each sensor output is fully temperature compensated, improving accuracy by minimizing variations due to temperature and aging effects. Each axial sensor has been tested over the -40° to + 85°C temperature range.
- **Built-in Calibration** - Calibration data for each sensor is maintained in the accelerometer. All data output is fully calibrated in accordance with NIST standards.
- **Self-Test** - Self-test signal and commands help verify channel integrity and wiring connections.
- **Rugged for Harsh Environments** - The XL403A is robust and can be used in harsh environments. The unit will survive 5000 g powered or unpowered.
- **Built-In Power Supply Regulation** - Unregulated DC power from +8.5 to +36 Volts is all that is required to measure acceleration and temperature. Reverse power voltages of up to -80 V can be withstood indefinitely. Transients of +80 V for 550 ms compatible with MIL-STD-704A can be withstood with full operation.
- **Small Size** - Completely conditioned triaxial accelerometer in less than one cubic inch.
- **Earth Friendly Design** - Lead-free design makes the XL403D environmentally safe while Spectrum Sensors' assembly process ensures reliable functionality. Fully-potted electronics eliminates the possibility of tin whiskers-related failures.
- **Three-Year Warranty** - Spectrum Sensors digital accelerometers come with a three-year factory warranty.

*Technical Data subject to change without notice

The XL403D is the first accelerometer to support SCPI-like commands, return data in engineering units, and work with any standard terminal emulator. It also performs basic functions such as evaluating minimum, maximum, magnitude, peak-to-peak, and tilt. The output is configurable by the customer - choose number of axes, units returned, bandwidth, sample rates, function specifics, and analysis results.

The sensor also contains a temperature sensor, microcontroller, and analog outputs in a small, easy-to-install package. The microcontroller takes 10-bit samples and performs temperature compensation and additional functions as programmed for output via the RS-485 interface.

Order the range option best suited for your application to measure from ±1 g to ±15 g, and set your own low pass filter for bandwidths from 1 to 800 Hz.

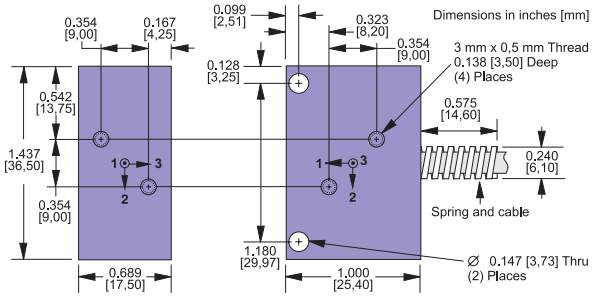
Specifications for XL403D - improved specifications available upon request

$T_A = T_{MIN}$ to T_{MAX}; Acceleration = 0 g, unless otherwise noted; within one year of calibration.

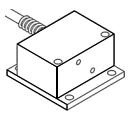
Parameter	Min	Typical	Max	Units	Conditions/Notes
Range - Measurement Full Scale	±1		±15	g	On each axis. Must specifiy via Option Rnnn
Sensitivity At 25°C, Option R005 Drift T_{MIN} to T_{MAX}		 400* ±0.65	 ±3	 mV/g %	 Precise values on calibration certificate Percent of sensitivity at 25°C
Zero g Bias Level At 25°C Drift T_{MIN} to T_{MAX}		 2.500 10	 20	 V mg	 Precise values on calibration certificate At 1.25°C/min. temperature rate of change
Alignment Deviation from ideal axes		 ±1.0	 ±2.0	 degrees	 Precise values on calibration certificate Can be compensated if required
Transverse Sensitivity		±0.25		%	Inherent sensor error, excluding misalignment
Nonlinearity		0.1	0.25	% FSR	Best fit straight line
Frequency Response	0		800	Hz	Upper cutoff per Option Bnnn, -3 dB pt ±10% 5-pole Butterworth filter
Noise Density		100		µg/√Hz	10 Hz to 400 HZ
Self Test Pull-up Resistor	5			kΩ	Logic "1" ≥ 3.5 V, Logic "0" ≤ 1.5 V, "0" causes self test
Temperature Sensor			±0.2	°C	Accuracy ±1 °C
Scan Rate	0.0007		2500	scans/sec	Default scan list (A1,A2,A3,T1)
ADC Resolution Absolute accuracy		10 ±2		bits LSB	
Outputs Output Voltage Swing Capacitive Drive Capability	 0.5	 1000	 4.5	 V pF	 I_{OUT} = ±0.5 mA
Power Supply (V_S) Input Voltage Limits Input Voltage - Operating Input Current Rejection Ratio	 -80 +8.5	 25 >120	 +80 +36	 V V mA dB	 -80 V continuous, >38 V if ≤550 ms, duty <1% Continuous DC
Temperature Range (T_A)	-40		+85	°C	
Mass		38		grams	Precise values on calibration certificate
Shock Survival	-5000		+5000	g	Any axis for 0.5 ms, powered or unpowered

*Scale linearly with Range option Rnnn - see Ordering Information

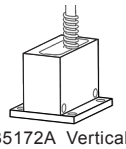
Mechanical



Mounting adapters (sold separately)



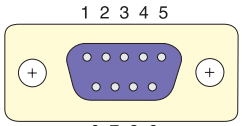
35173A Horizontal



35172A Vertical

Connections

T004
Male D-Shell Connector



Pin	1	2	3	4	5	6	7	8	9
Signal	Analog1+	Analog2+	Analog3+	Signal -	RS485-	RS485+	ST/Aux	+Vs	Gnd
Wire	Brown	Red	Orange	Yellow	Green	Blue	Violet	Grey	White

Ordering Information

XL403D - X1 - R006 - T004 - K11

Instrument
XL403D

Axes
X1 : Uniaxial
X2 : Biaxial
X3 : Triaxial

Range
Rnnn : Choose 001 (±1 g) through 015 (±15 g)

Termination Length
T004 : 4 ft. cable with DB9M
Tnnn : Custom length, nnn ft.

Interface Kit
0 : None
1 : Interface kit with US power supply
2 : Interface kit with int'l power supply

Adapter
0 : None
1 : 35173A Horizontal mounting adapter
3 : 35172A Vertical mounting adapter

Rev. 8/23/2012

+1 330.659.3312
2236 N. Cleveland-Massillon Rd.
Akron, Ohio 44333-1255

+1 855.294.3800
www.apitech.com

api technologies corp.