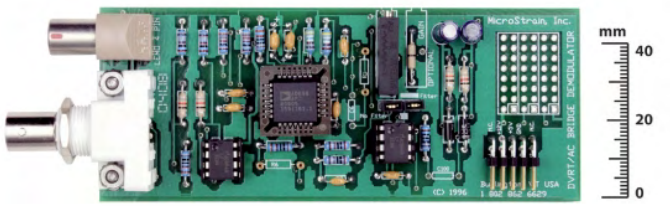
DEMOD- DVRT®

Signal Conditioner

Designed for ease of use and general versatility, this printed circuit card provides complete conditioning for any of LORD MicroStrain®'s DVRT® sensors. Each card contains all the requisite components to facilitate plug-and-play use, including active, jumper selectable low pass filters, input supply line filters with reverse input protection, and output line buffers. The DEMOD-DVRT® sine wave excitation and synchronous demodulator provide excellent noise rejection and elimination of thermally induced potentials.



Features & Benefits

High Performance

- temperature compensated signal conditioning
- precision synchronous demodulation
- rapid warm-up time

Ease of Use

- plug-and-play with LORD MicroStrain® motherboards
- compatible with all LORD MicroStrain® DVRT sensors
- adjustable trimmers to set resolution range

Applications

Used with LORD MicroStrain® DVRT® sensors for:

- Invivo Strain, Micromotion and deformation in Bone & Tissue
- Process Control for Production-Line Monitoring
- Miniature Position Control Elements
- Linear & Angular Motion Control
- Measuring Strain and Deflection in Materials and Structures
- Dimensional Gauging for Quality Control

System Overview

Operating from a DC power supply, the DEMOD-DVRT® Signal Conditioner filters incoming transients from the line voltage, and supplies a pure sine wave excitation to the transducer's bridge. This excitation is used to measure minute impedance changes of the sensing elements. A differential amplifier raises AC input voltages in order to provide optimum demodulator performance. The output is filtered and buffered to provide clean, high level signals over coaxial cable.

The DEMOD-DVRT® is recommended for use with all standard LORD MicroStrain® DVRT® where the temperature is expected to uniformly change across the sensor itself. If the sensor is expected to be exposed to thermal gradients across its sensing coils (its body), the temperature compensated DEMOD-DVRT® -TC is recommended.

Typically, a DEMOD-DVRT® is ordered with a specific LORD MicroStrain® DVRT® and sold as a pair. The pair is calibrated together at the factory and delivered with a common calibration certificate to ensure accurate performance in the user's hands. The certificate provides several output calculations including Linear Fit, Multi-Segment Fit and Polynomial Fit.

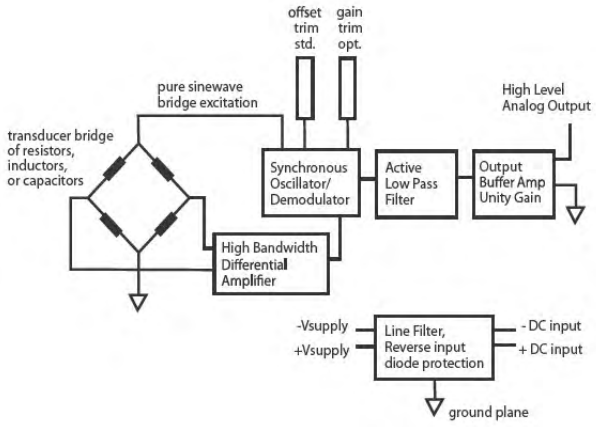
LORD MicroStrain®'s Motherboard products are designed to house 1 to 8 DEMOD-DVRT®. The Motherboards have a desktop console form factor and provide a plug-and-play chassis. The Motherboard variously provides power, grounding, multiplexing, analog-to-digital conversion, configuration, analog output, RS-232 output and LCD display.

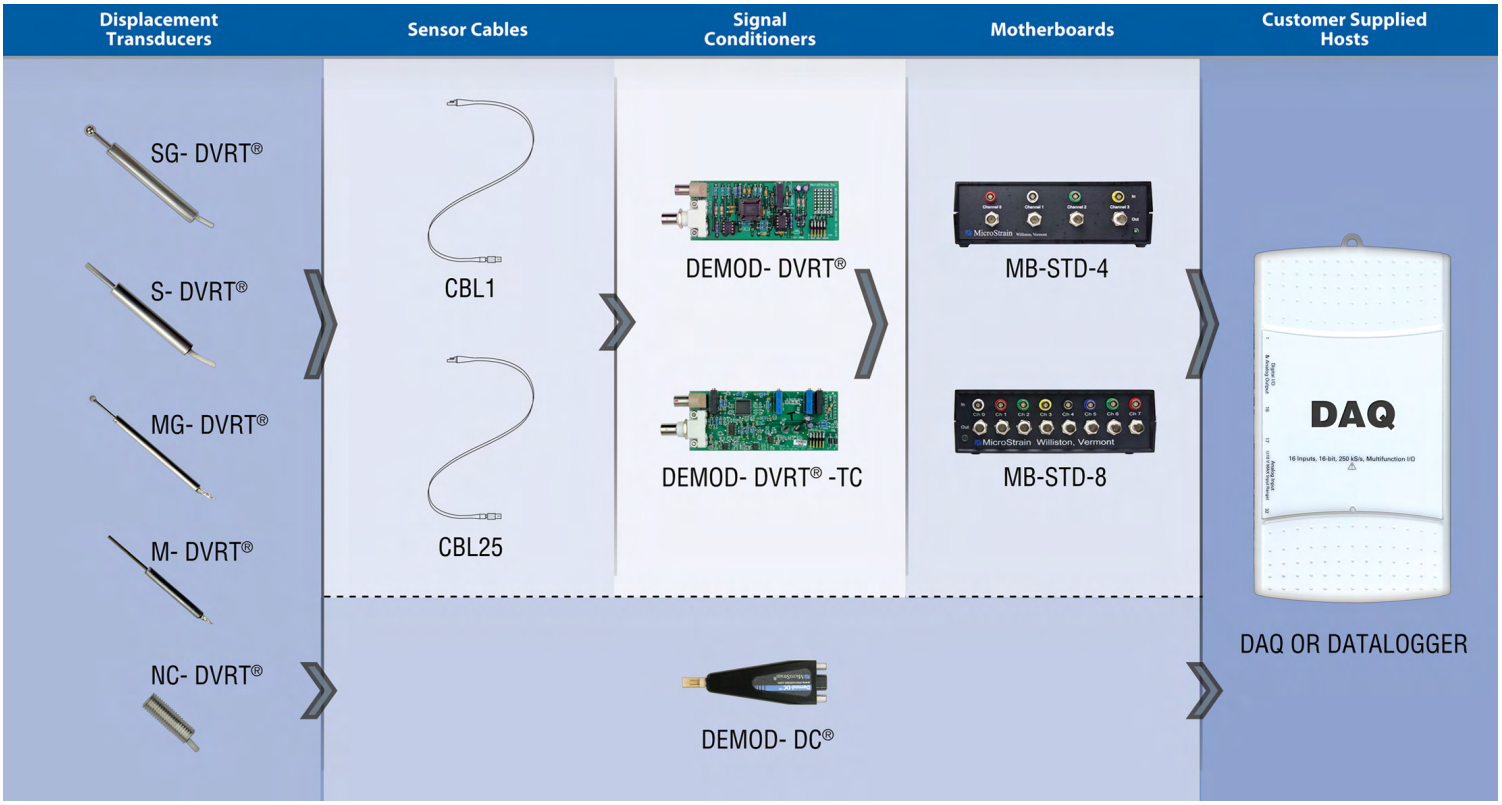
DEMOD- DVRT® Signal Conditioner

Specifications

Sensor types	inductive (DVRT®)
Excitation	regulated sinewave, 70 KHz typical
Demodulation	synchronous, DC output
Output	± 4.5 volts typical
Gain	factory adjustable 10-10,000
Low pass filter	2 pole, active Butterworth, 3 dB down @ 1 KHz standard; factory adjustable 10 Hz-8 Khz
Supply voltage	motherboard supplies power (typical), ± 6.5 volts min, ± 16 volts max (when used without motherboard)
Supply current	30 milliamps per rail
Warm-up time	15 minutes recommended
Operating temperature	-40 to +85˚C
PC board Size	120mm x 48mm x 20mm (thick)
Connectors	10 pin, .1" pitch header (power, ground); LEMO 4 pin receptacle (bridge points); BNC (analog output)
Trimmers	offset (std.)

Electrical Block Diagram





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