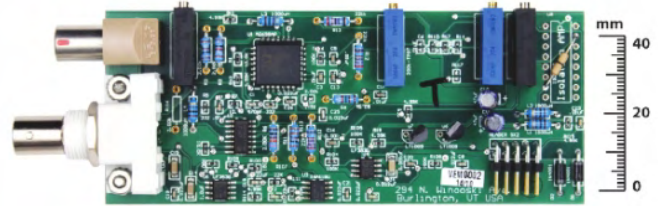


DEMODO- DVRT® -TC

Temperature Compensated Signal Conditioner

Designed for ease of use and general versatility, this printed circuit card provides complete temperature compensated conditioning for any sensors. The DEMODO-DVRT® -TC utilizes both alternating current and direct current excitation of the sensor's inductive bridge to accurately measure position in the face of temperature gradients. Each card contains 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 DEMODO-DVRT® -TC 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:

- In vivo 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

Many oscillator/demodulator type signal conditioners for use with half bridge LVDT, LORD MicroStrain® DVRT® and non-contacting variable reluctance/eddy current sensors have relied on the use of two coils arranged in a differential manner to amplify position and to cancel temperature effects. However, this method of compensation is only effective when both coils experience the same temperatures simultaneously. In practice, thermal gradients commonly occur across sensing coils, resulting in a difference in the sensing coil's resistance as compared to the reference coil. The DEMODO-DVRT® -TC Temperature Compensated Signal Conditioner overcomes this limitation by injecting both AC and DC excitation into the coils, and demodulating the AC component of the bridge signal separately from the DC component. The differential signal produced by the bridge in response to the DC excitation is amplified and subtracted from the demodulated (and amplified) AC response. The resulting output is free from temperature gradient errors. Linear plunger type and non-contacting inductive sensors are now available in very small diameters (<1 mm), and single coil sensors possess nearly 1:1 body length-to-stroke ratios, without sacrificing thermal stability.

LORD MicroStrain® Motherboard products are designed to house the DEMODO-DVRT® -TC. 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. Motherboards can support 1 to 8 DEMODO-DVRT® -TC, have a small footprint, and operate within a wide temperature range.

Specifications

Compensates for a temperature gradient across the sensor

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

