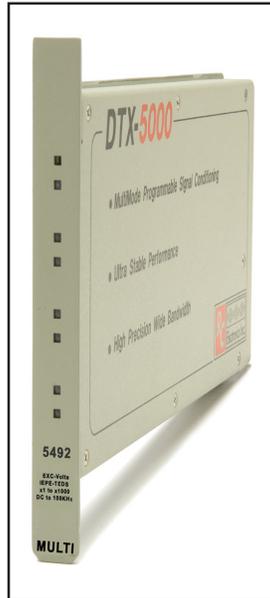


Description

The 5492 is a multi-mode signal conditioner which combines both constant current and voltage excitation capability in a single 4 channel module; this module also includes Programmable Linearized Thermocouple as found in the 5120. Combining the features of the 53xx series of instrumentation amplifiers with programmable current sources for use with IEPE type transducers allows multiple transducer types to be handled by a single module. The use of programmable excitation voltage sources with the ability to adjust for DC input offsets gives a complete solution for most sensor types not requiring bridge completion. TEDS (Transducer Electronics Data Sheet) capability further enhances system wide integration with the ability to automatically read embedded transducer data sheets for system level calibration and test setup.

Design Features

The DTX-5492 features 4 individual programmable voltage sources which can be set from 0.01 volts up to 10.00 volts in 10 mV steps alongside 4 individual programmable current sources which can be set from 1 mA to 20 mA in 0.1 amp steps while maintaining a full 24 volt compliance. In addition TEDS capability is included for ease of setup and error free calibrations. Programmable bandpass filtering, automated or manual input bias balance, AC/DC input coupling, on board NIST traceable calibration and front panel status monitors are standard features. As with all the DTX-5000 series products input noise is less than 10uV with full signal bandwidth of 100 kHz.



5492 Four Channel Multi-Mode Signal Conditioner

Programmable Excitation Current

A programmable constant current source provides excitation power for the sensor. A Digital-to-Analog Converter creates a programmable control voltage that is used to control the output of current regulator. The current being drawn is sensed and used as a feedback signal to keep the current constant. Each circuit can provide up to 20 mA of excitation current with a maximum output voltage of 24v.

Voltage Excitation with AutoZero/AutoGain Capability

The 5492 provides four independent programmable excitation voltage sources for use in powering input sensors. Each source is controlled by a 16 bit DAC with an output range from 0 to 10 Volts and 100 mA output

Features

- **IEPE Accelerometers**
Constant current excitation
Programmable 1-20 mA
Compliance Voltage 24V
- **Voltage Excitation**
to 10 V @ 100mA
- **Wideband Response**
Gain Range: 1 to 1000
DC to 100 kHz
- **Ultra-stable Low Noise Amps**
Output Noise: 1 mV rms
Stability: 50 ppm/°C
- **Compact Rugged Enclosure**
- **TEDS Compliant**

buffering. Injecting a programmable offset voltage allows the DSP to automatically servo the amplifier output to zero adjust any input offset voltage imbalance. In a like manner, the DSP can adjust the amplifier gain for a targeted analog output voltage value upon application of a known calibration signal.

Stable Amplifier Circuitry

After AC/DC coupling, the signal is amplified by a fixed-gain precision instrumentation amp. Using this approach ensures high common-mode rejection to reduce noise pickup on the sensor wires, and avoids the use of switched gain resistors in the most noise and temperature sensitive portion of the circuit. Offset adjustment is done after preamplification to isolate the offset voltage generator from the sensor. A

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programmable gain amplifier is then used for additional signal magnification as required by subsequent processing stages. Precision op-amps and resistors are used throughout all of the analog circuitry to improve temperature stability.

DSP - Programmable Gain

The variable gain amplifier is controlled by an onboard DSP prior to digitization and subsequent processing. A 16-bit high speed Sigma-Delta converter is then used to convert the amplifier input to a digitized signal for subsequent processing. The Digital Signal

Processor uses stored offset and gain calibration factors to correct the digitized data values and generate a digitally filtered output. Digital lowpass filtering is done by the DSP, providing a better response curve and more flexibility than switched analog filters. The result is an amplified, error-corrected, and digitally-filtered output that is ready to be converted back to an analog output voltage.

Output Circuit

The processed digital output is converted back to an analog voltage by a high-speed 16-bit Digital-to-Analog Converter. A four-pole lowpass filter/buffer-amp removes the digitizing steps in the reconstructed

signal, along with any high-frequency noise. As with the input circuit, temperature-stable components are used to ensure that system calibration holds over a wide temperature range.

Signal and Status Monitor LEDs

Front-panel LED's are used to monitor both the signal level and the operating status of each channel. The DSP compares each digital sample to the level set by the user, and adjusts the intensity and color of the Signal LED accordingly. The DSP also monitors the excitation current level and overall digital operation, and sets the color and flash-rate of the Status LED as needed to warn the user of a problem.

Specifications

General

Gain Range	1 to 1000, programmable
Frequency response	DC to 100kHz
Gain accuracy	±0.05%
Linearity	±0.01%
Stability	50 ppm /°C
Input noise	10uV rms
Input Protection	250V max.
Input coupling	AC to DC programmable
Output Noise	1 mV rms
Output voltage range	±10v@50 mA
Output impedance	50 ohms
Short Circuit Protected	Yes

Input Offset Compensation

Programmable

Low Pass Filter

Type	Digital, programmable
Range	1 Hz to 100 kHz
Roll-off	96 dB/octave, programmable

Overload Indicator

Type	Front-panel LED
Trip Level	0.1V to 10V, programmable

Calibration Source

Type	Internal voltage reference
Voltage range	0 to 2.5v, programmable
Accuracy	0.01%
Stability	10 ppm /°C

Current Excitation

Type	Constant current
Range	1 to 20 mA, programmable
Accuracy	0.5%
Compliance	24v
Stability	10 ppm /°C

Voltage Excitation

Type	Programmable Voltage
Voltage range	0.1 to 10v @ 100 mA
Sense	Local or Remote
Accuracy	0.02%
Short protection	Yes

Environmental:

Operating temperature	0 to 50 °C
Storage temp	-25 to 85 °C
Humidity	0 to 90% non condensing

Physical Characteristics

Package	Shielded, 6 sides
Dimensions	0.8" x 4.2" x 9.5"
Weight	1.3 lbs