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High Performance, Economy Strain Gage/RTD Conditioners

Models 2B30 and 2B31

FEATURES

Low Cost

Complete Signal Conditioning Function

Low Drift: $0.5\mu\text{V}/\text{C}$ max ("L"); Low Noise: $1\mu\text{V}$ p-p max

Wide Gain Range: 1 to 2000V/V

Low Nonlinearity: 0.0025% max ("L")

High CMR: 140dB min (60Hz, $G = 1000\text{V/V}$)

Input Protected to 130V rms

Adjustable Low Pass Filter: 60dB/Decade Roll-Off (from 2Hz)

Programmable Transducer Excitation: Voltage (4V to 15V @ 100mA) or Current (100 μA to 10mA)

APPLICATIONS

Measurement and Control of:

Pressure, Temperature, Strain/Stress, Force, Torque

Instrumentation: Indicators, Recorders, Controllers

Data Acquisition Systems

Microcomputer Analog I/O

GENERAL DESCRIPTION

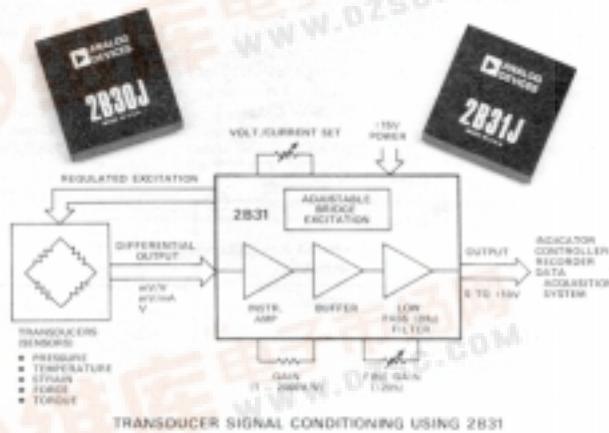
Models 2B30 and 2B31 are high performance, low cost, compact signal conditioning modules designed specifically for high accuracy interface to strain gage-type transducers and RTD's (resistance temperature detectors). The 2B31 consists of three basic sections: a high quality instrumentation amplifier; a three-pole low pass filter, and an adjustable transducer excitation. The 2B30 has the same amplifier and filter as the 2B31, but no excitation capability.

Available with low offset drift of $0.5\mu\text{V}/\text{C}$ max (RTI, $G = 1000\text{V/V}$) and excellent linearity of 0.0025% max, both models feature guaranteed low noise performance ($1\mu\text{V}$ p-p max), and outstanding 140dB common mode rejection (60Hz, CMV = $\pm 10\text{V}$, $G = 1000\text{V/V}$) enabling the 2B30/2B31 to maintain total amplifier errors below 0.1% over a 20°C temperature range. The low pass filter offers 60dB/decade roll-off from 2Hz to reduce normal-mode noise bandwidth and improve system signal-to-noise ratio. The 2B31's regulated transducer excitation stage features a low output drift (0.01 5%/°C max) and a capability of either constant voltage or constant current operation.

Gain, filter cutoff frequency, output offset level and bridge excitation (2B31) are all adjustable, making the 2B30/2B31 the industry's most versatile high-accuracy transducer-interface modules. Both models are offered in three accuracy selections, J/K/L, differing only in maximum nonlinearity and offset drift specifications.

APPLICATIONS

The 2B30/2B31 may be easily and directly interfaced to a wide variety of transducers for precise measurement and control of pressure, temperature, stress, force and torque. For applications



in harsh industrial environments, such characteristics as high CMR, input protection, low noise, and excellent temperature stability make 2B30/2B31 ideally suited for use in indicators, recorders, and controllers.

The combination of low cost, small size and high performance of the 2B30/2B31 offers also exceptional quality and value to the data acquisition system designer, allowing him to assign a conditioner to each transducer channel. The advantages of this approach over low level multiplexers include significant improvements in system noise and resolution, and elimination of crosstalk and aliasing errors.

DESIGN FEATURES AND USER BENEFITS

High Noise Rejection: The true differential input circuitry with high CMR (140dB) eliminating common-mode noise pickup errors, input filtering minimizing RFI/EMI effects, output low pass filtering ($f_c=2\text{Hz}$) rejecting 50/60Hz line frequency pickup and series-mode noise.

Input and Output Protection: input protected for shorts to power lines (130V rms), output protected for shorts to ground and either supply.

Ease of Use: Direct transducer interface with minimum external parts required, convenient offset and span adjustment capability.

Programmable Transducer Excitation: User-programmable adjustable excitation source-constant voltage (4V to 15V @ 100mA) or constant current (100 μA to 10mA) to optimize transducer performance.

Adjustable Low Pass Filter: The three-pole active filter ($f_c=2\text{Hz}$) reducing noise bandwidth and aliasing errors with provisions for external adjustment of cutoff frequency.



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