

Data Acquisition Conditioner

FEATURES

- Four input channels with RJ-45 connectors
- Hardware and software support for quarter-, half- and full-bridge circuits
- Built-in precision bridge completion for 120-, 350-, and 1000-ohm half and quarter bridges
- 8-Hz sampling rate
- Intuitive, user-friendly software communicates with up to six D4 units simultaneously
- Automatic and manual zero-balance and calibration
- Full control of all functions via USB Interface
- Portable, lightweight, and rugged design
- Powered via USB interface
- Programmable for custom applications

DESCRIPTION

The Model D4 Data Acquisition Conditioner is a portable, USB-powered precision instrument for use with resistive strain gages and strain gage-based transducers.

The Model D4 has four channels of data acquisition. Connection to each channel is via a RJ-45 connector. Each channel of input accepts either full-, half-, and quarter-bridge configuration. All required bridge completion components for 120-, 350-, and 1000-ohm bridges are supplied.

Operation of the Model D4 is performed with commands sent via the USB connection. User-friendly application software is provided to control the D4 with a MS Windows-based personal computer. The software connects with up to six D4 units to create a system of up to 24 channels. The D4 units can be connected directly to a computer through its USB ports or through a USB hub.

A Programmer's Reference Kit that includes a Programmer's Reference Manual, a NI LabVIEW instrument driver, and programming examples to simplify writing custom applications is also included. The D4 is also supplied with a calibration software utility that allows calibration of the D4 via the USB interface. The application software, Programmer's Reference Kit, and Instruction Manual are on a single CD included with the D4 unit.

The Model D4 uses modern digital signal processing technology to provide excellent noise rejection and stability. Proprietary scaling and linearization algorithms provide unsurpassed measurement accuracy for strain gage bridge measurements.



SPECIFICATIONS

Note: Performance may be degraded at high levels of repetitive electrostatic discharge; however, no damage to the unit will occur.

INPUT CONNECTIONS

Type: RJ-45 Modular

Quantity: Four

BRIDGE CONFIGURATIONS

Types: Quarter-, half-, and full bridges

Bridge Impedance: 60 to 2000 Ω

Internal Bridge Completion:

Quarter bridge: 120 Ω , 350 Ω and 1000 Ω
 $\pm 0.01\%$

Half bridge: 1000 $\Omega \pm 0.01\%$

DATA CONVERSION

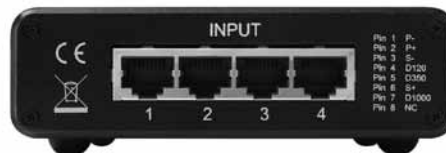
A/D Converter: Delta-sigma with integral chopper-stabilized programmable gain instrumentation amplifier

Resolution: 24 bits. Noise-free resolution: 18 bits typ.

Filter: Integrated linear phase FIR Sinc5 filter followed by a Sinc3 filter with a programmable decimation rate. Software selectable output rate provides >120 dB rejection of 50 or 60 Hz and higher level harmonics.



Front Panel



Back Panel

Data Acquisition Conditioner

MEASUREMENT RANGE/RESOLUTION

Strain Range: $\pm 31,000 \mu\epsilon$ at GF = 2.000.
($\pm 15.5 \text{ mV/V}$)

Resolution: $\pm 1 \mu\epsilon$ at GF = 2.000 ($\pm 0.0005 \text{ mV/V}$)

MEASUREMENT ACCURACY

$\pm 0.1\%$ of reading ± 3 counts. (Instrument Gage Factor = 2.000)

GAGE FACTOR CONTROL

Range: 0.500 to 9.900

BALANCE CONTROL

Type: Software

Control: Manual or automatic

BRIDGE EXCITATION

Value: 1.5 VDC nominal

Control: Software enable/disable

Measurements are fully ratiometric, and not degraded by variations in excitation voltage

COMMUNICATION INTERFACE

Universal serial bus (USB). Cable included

SHUNT CALIBRATION

Location: Across each quarter-bridge completion resistor

Control: Software

Values:

P– to D120: $11.94 \text{ K } \Omega \pm 0.1\%$
($5000 \mu\epsilon$ at GF = 2.00)

P– to D350: $34.8 \text{ K } \Omega \pm 0.1\%$
($5000 \mu\epsilon$ at GF = 2.00)

P– to D1000: $99.5 \text{ K } \Omega \pm 0.1\%$
($5000 \mu\epsilon$ at GF = 2.00)

POWER

USB: 5 V 100 mA

OPERATIONAL ENVIRONMENT

Temperature: 0° to $+50^\circ\text{C}$

Humidity: Up to 90% RH. Non-condensing.

CASE

Material: Aluminum

SIZE AND WEIGHT

Size: 4.3 W x 1.4 H x 5.7 L inches
(110 x 36 x 145 mm)

Weight: 0.8 lb. (0.36 kg)

ACCESSORIES

D4-A106 Shielded Connectors

D4-A108 Crimping Tool

D4-A116 USB Cable (Type A to Type B—6-foot length)