DI-500/510 Series and DI-750/760 Series

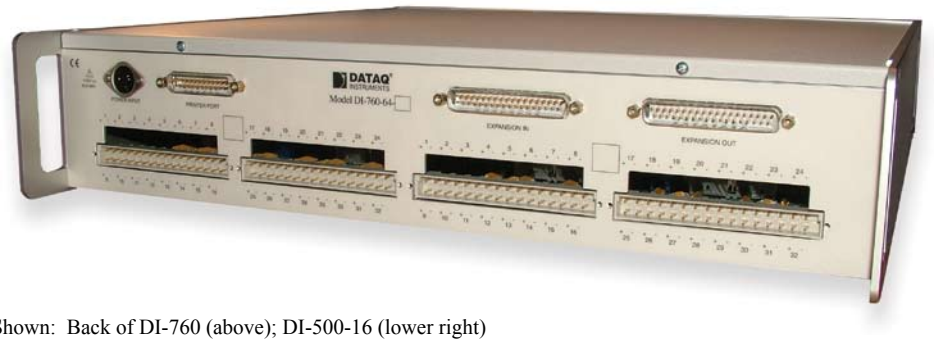
DATAQ INSTRUMENTS

From Sensor to Results with One Product

Accepts DI-5B Series Plug-in Signal Conditioners

Built-in ADC and Computer Printer Port Interface

Portable and Desktop or Rackmount Configurations Available



Shown: Back of DI-760 (above); DI-500-16 (lower right)

DI-500/510 and DI-750/760 Series data acquisition instruments offer a full range of solutions for demanding industrial measurements. Each instrument in the family is fully integrated to provide signal conditioned measurement types—without multiple boxes. Instruments conveniently attach to the printer port of any desktop PC. Their built-in ADC allows sample rates of one to 250,000 samples per second in either triggered or continuous data acquisition modes. Best of all, plug-in DI-5B series signal conditioners allow virtually any industrial measurement to be made with fail-safe, 600-volt input-to-output isolation. It has never been easier to bring an instrument to a measurement site or safer to make demanding industrial measurements with more flexibility.

Features

Portable Configurations

Do you make measurements on the run? Then consider our DI-500/510 Series of products. The portable case is constructed of tough, nonconductive plastic. A carrying handle and latching lid allow you to move the instrument to and from any measurement site with ease. Built-in banana connector jacks and screw terminals simplify signal connections in the field.

Desktop Configurations

Is a dedicated measurement in order? Then consider our DI-750/760 Series desktop model. This sleek 3½-in. high unit occupies little space and may be mounted in a 19 in. rack with an optional kit.

Connect To Any PC

Instruments connect to standard, bidirectional, or enhanced parallel ports (EPP) of desktop, laptop, or notebook PCs.

Signal Conditioned Inputs

Select from 16 to as many as 32 DI-5B module signal conditioned channels—all within a single enclosure. DI-5B modules connect you to the entire spectrum of industrial measurements: VDC, VAC, Thermocouple, RTD, Frequency, Current, Potentiometer, and Strain. Built-in 600V of input-to-output isolation lets you make any measurement you need under any circumstances.

AC- or DC-powered

All instruments are supplied with an adapter to operate from any convenient AC outlet - or power the units from any 9 to 36 VDC source.

WinDaq Software Support

The entire DI-500/510 and DI-750/760 product line is supported by WinDaq data acquisition, playback, and analysis software. WinDaq allows you to acquire multichannel data, display it in real time, and record it to disk with time and date and full calibration information. Playback software allows you to review previously recorded data and graphically analyze it in a variety of different ways.

Additional Software Support

DI-500/510 and DI-750-760 Series instruments are provided with a complete software development kit for DOS and Windows. A DLL allows you to integrate the instrument with any Windows program. A number of DOS libraries allow access to product hardware through a wide range of DOS programming languages. Drivers for LabVIEW and TestPoint are provided by request at no charge.

DATAQ Instruments, Inc. • 241 Springside Drive • Akron, Ohio 44333 • Tel: 330-668-1444 • Email: support@dataq.com • www.dataq.com

Data Acquisition and Signal Conditioning in One Package

1 Choose your system

Select a DI-500 portable unit with a carrying case and latching lid, a DI-750/760 desktop unit with or without a 19-in rack mount adapter, and your required mix of signal conditioned or high-level input channels.

2 Install amplifiers

Select from our wide range of fully isolated signal conditioning modules (see pages 6-7 for details). Install your choices directly into the DI-500 Series mainframe, then accurately measure virtually any industrial signal with complete safety.

3 Connect your computer

Just a single cable connects your DI-500 Series instrument to the printer (parallel) port of any size portable computer.

4 Connect power

Use our provided AC adapter, or connect the unit to any 9 to 36VDC source (including a car battery). Flexible power requirements allow DI-500 Series instruments to travel anywhere you do.

Data Acquisition and Signal Conditioning in One Package

5 Connect your signals

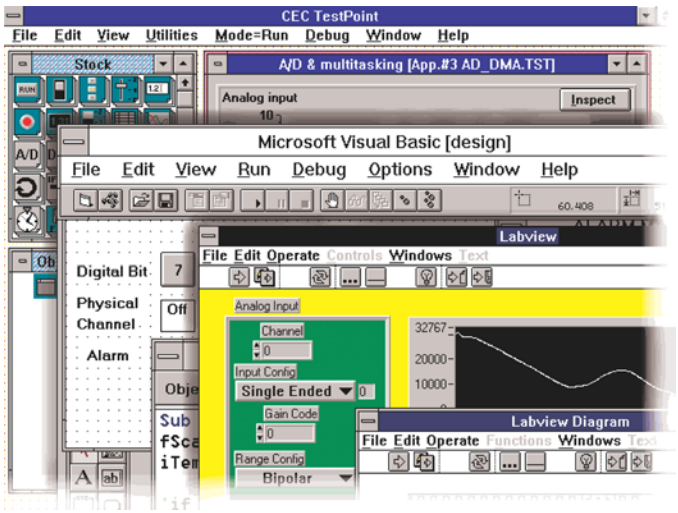
DI-500 Portable units allow dual-access signal connections using sheathed banana connectors, or screw terminals for bare wires such as thermocouples. DI-750/760 Desktop and rack-mounted units support screw terminal access.

6 Switch-on

Our simplified control panel has only one switch that turns power on or off. Everything else is controlled by the computer. A green "Power" lamp glows when power is applied. A red "Active" lamp glows whenever data acquisition is in progress.

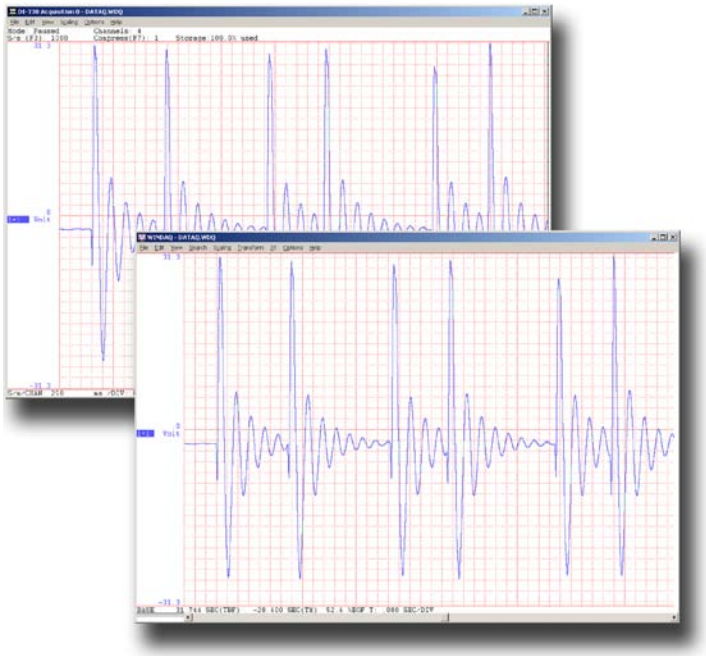
7 You can program…

Is your application unique? Do you need to program the hardware yourself? Use our Windows Dynamic Link Library (DLL) and DOS libraries with any popular programming language or request our free LabVIEW or TestPoint drivers.



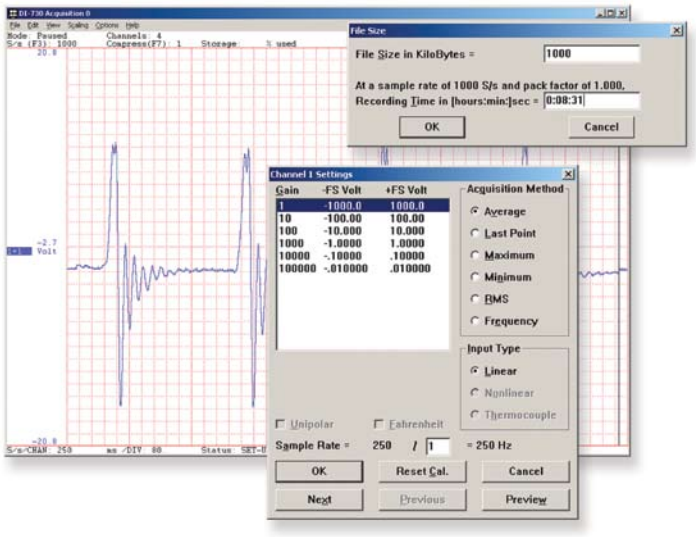
8 …Or not

Maybe you want to load ready-to-run software and just start taking data. Our WinDaq software fits this requirement. Without writing a single programming line, WinDaq allows you to acquire, display, record, playback, and analyze data with more flexibility and speed than you've ever seen on a PC. Read more about it on pages 4 and 5.



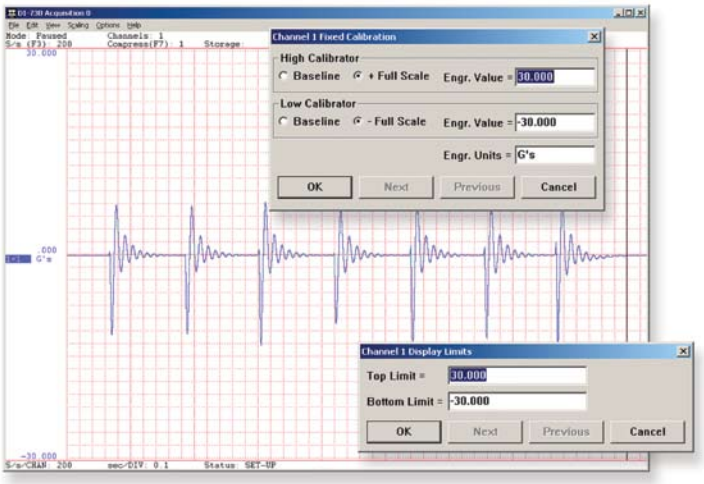
Setup

Double-click and enter the channels you want to acquire into the WINDAQ scan list. Click to select gain, signal averaging, true RMS, frequency, and peak or valley detection per channel. Click to define a single to 32-channel display — either triggered sweep (oscilloscope-like) or scrolling (chart recorder-like). Click again to define a sample rate ranging from less than one to 250,000 per second. With WINDAQ/Pro+ you can even define different sample rates on a per channel basis.



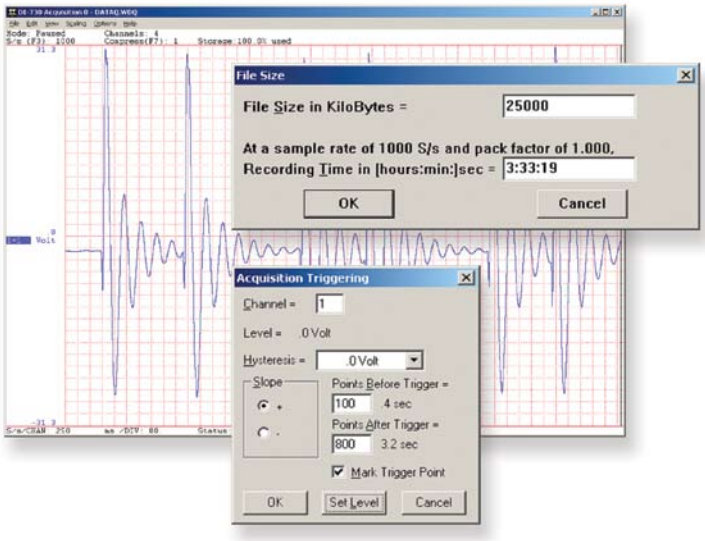
Calibrate

Define calibration per channel to display waveform values in meaningful units such as psi, °F or °C, amps, rpm, watts, horse-power — any unit of measure you need.



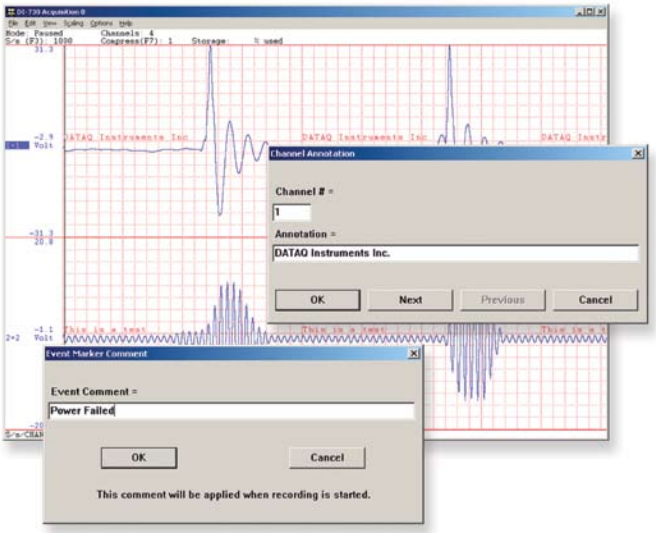
Record

Choose a continuous waveform recording mode or the triggered mode with selectable trigger level, slope, and pre- and post-trigger times. WINDAQ automatically time- and date-stamps, then streams acquired data to disk — record as much data as you need. At the same time, WINDAQ supplies a real-time graphical display of any or all channels so you always know where you are and where you're going.



Annotate

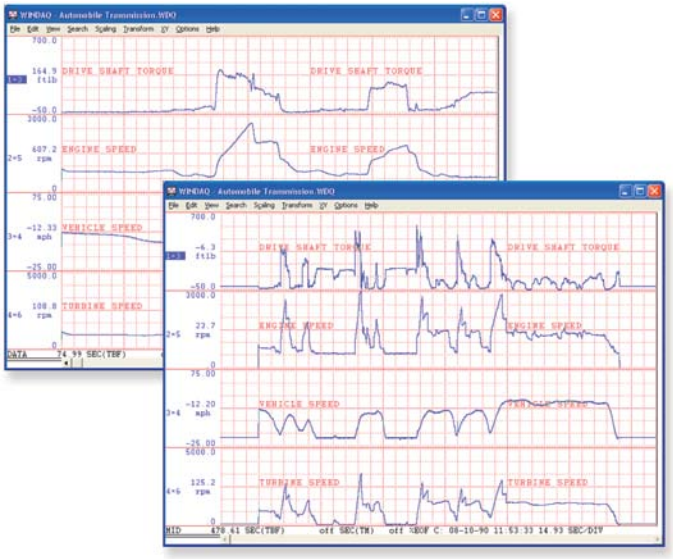
Of course, you can label any channel with text that describes it — "Motor 1," "Engine speed," "Vertical position," etc. But WINDAQ also allows you to supply commented event markers while you record — "Beginning test phase 1," "Small vibrations noticed," "Starting cool-down cycle," etc. Your comments and our acquired data combine to form a complete diary of your data acquisition session.



WINDAQ Playback Software

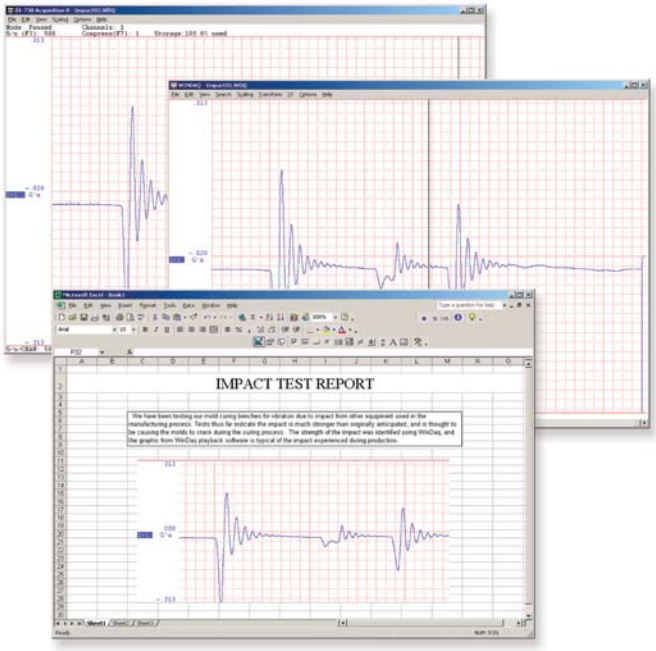
Playback

Recording is only half the solution. WINDAQ's Waveform Browser playback software allows you to graphically manipulate waveforms in ways you've never seen on a PC. Compress an entire recording to one screen-width for a bird's eye view, then expand around an area of interest for a closer look. Use the cursor to measure amplitudes and timing with precision. Move to any event marker with the click of a mouse button.



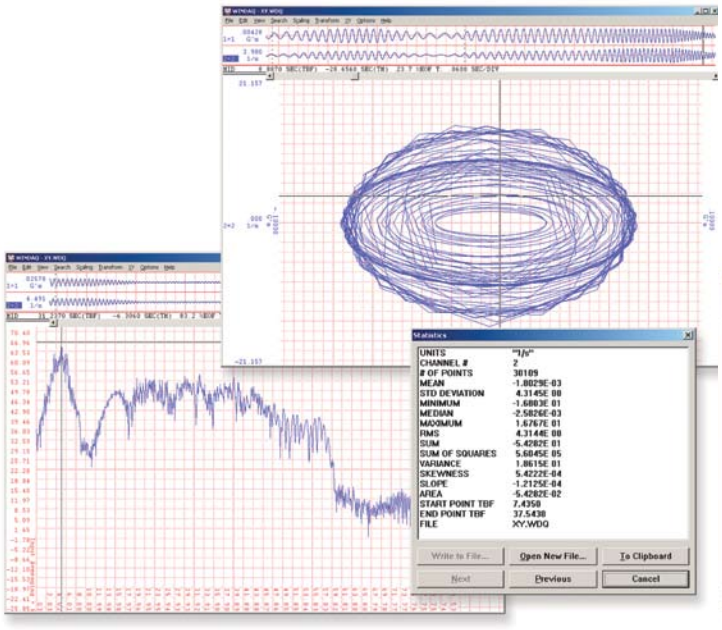
Multitask

Double your productivity and let WINDAQ record while you review last week's results from your spreadsheet, or compose a memo with your word processor. You can even play back data already stored to disk while you're still recording.



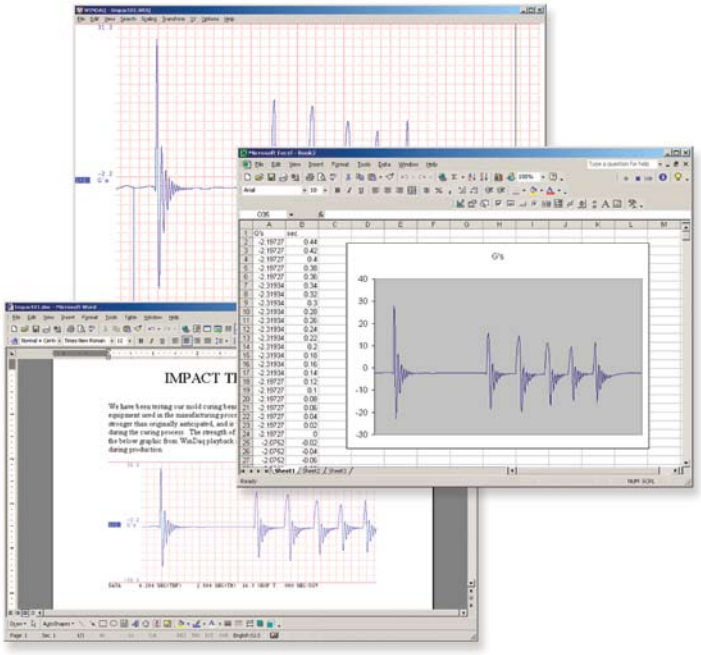
Analyze

Waveform interpretation is easy with our built-in analysis functions. Apply frequency and filtering analysis with the WINDAQ Waveform Browser FFT and DFT functions. Analyze any range of waveform data with the statistics function. Use X-Y plotting to examine the relationship of one channel to another. Extended analysis functions allow waveform peak detection, integration, differentiation, arithmetic operations, and more.



Export

The WINDAQ Waveform Browser can export any range of data to your spreadsheet, or any other analysis or presentation package you use. You can even copy a graphical image displayed by the WINDAQ Waveform Browser and paste it directly into a word processing document. Finally, export any range of waveform graphics to your printer for a hard copy record.



Signal Conditioning Module Selection Guide

Each DI-5B module is a single channel, isolated analog input that interfaces to all types of sensors. The modules filter, isolate, amplify, and convert input signals to a high-level analog signal suitable for A/D conversion. Over 80 modules address the full spectrum of industrial measurements.

Key Features

- Installed in the DI-75B, these modules interface virtually any industrial signal to DI-700, DI-720, or DI-730 Series Instruments.
- Convenient, flexible, mix-and-match approach.
- Full isolation reduces noise and protects you and your equipment from large, common mode voltages.
- Custom modules are available.

Common Specifications

- 1000V isolation (if requirements exceed 600V contact DATAQ Instruments)
- 240 VAC input protection
- 160db common mode rejection
- -40°C to +85°C operating temperature range
- Small size: 2.28" × 2.26" × 0.60" (58mm × 57mm × 15mm)

Analog Voltage Input Modules (4Hz or 10kHz BW)

Narrow Bandwidth (4Hz)		Wide Bandwidth (10kHz)	
MODEL NO.	**Input Range**	**MODEL NO.**	**Input Range**
DI-5B30-01	±10mV	DI-5B40-01	±10mV
DI-5B30-02	±50mV	DI-5B40-02	±50mV
DI-5B30-03	±100mV	DI-5B40-03	±100mV
DI-5B31-01	±1V	DI-5B41-01	±1V
DI-5B31-02	±5V	DI-5B41-02	±5V
DI-5B31-03	±10V	DI-5B41-03	±10V
DI-5B31-07	±20V	DI-5B41-07	±20V
DI-5B31-09	±40V	DI-5B41-09	±40V

DC Transducer Input Modules with +10VDC Excitation

MODEL NO.	Input Range	MODEL NO.	Input Range
DI-5B43-01	±1V	DI-5B43-06	±6V
DI-5B43-02	±2V	DI-5B43-07	±7V
DI-5B43-03	±3V	DI-5B43-08	±8V
DI-5B43-04	±4V	DI-5B43-09	±9V
DI-5B43-05	±5V	DI-5B43-10	±10V

2-wire Transmitter Interface Module (100Hz BW)

MODEL NO.	Input Range	Excitation
DI-5B42-01	4 to 20mA	Nom. 20V at 4 to 20mA

Linearized Thermocouple Input Modules (4Hz BW)

MODEL NO.	Type	Input Range
DI-5B47J-01	J	0°C to +760°C (+32°F to +1400°F)
DI-5B47J-02	J	-100°C to +300°C (+148°F to +572°F)
DI-5B47J-03	J	0°C to +500°C (+32°F to +932°F)
DI-5B47J-12	J	-100°C to +760°C (-148°F to +1400°F)
DI-5B47K-04	K	0°C to +1000°C (+32°F to +1832°F)
DI-5B47K-05	K	0°C to +500°C (+32°F to +932°F)
DI-5B47K-13	K	-100°C to +1350°C (-148°F to +2462°F)
DI-5B47K-14	K	0°C to +1200°C (+32°F to +2192°F)
DI-5B47T-06	T	-100°C to +400°C (-148°F to +752°F)
DI-5B47T-07	T	0°C to +200°C (+32°F to +392°F)
DI-5B47E-08	E	0°C to +1000°C (+32°F to +1832°F)
DI-5B47R-09	R	+500°C to +1750°C (+932°F to +3182°F)
DI-5B47S-10	S	+500°C to +1750°C (+932°F to +3182°F)
DI-5B47B-11	B	+500°C to +1800°C (+932°F to +3272°F)
DI-5B47N-15	N	-100°C to +1300°C (-148°F to +2372°F)

Frequency Input Modules

MODEL NO.	Input Range	Excitation
DI-5B45-01	0 to 500Hz	+5.1V @ 8mA max
DI-5B45-02	0 to 1kHz	+5.1V @ 8mA max
DI-5B45-03	0 to 3kHz	+5.1V @ 8mA max
DI-5B45-04	0 to 5kHz	+5.1V @ 8mA max
DI-5B45-05	0 to 10kHz	+5.1V @ 8mA max
DI-5B45-06	0 to 25kHz	+5.1V @ 8mA max
DI-5B45-07	0 to 50kHz	+5.1V @ 8mA max
DI-5B45-08	0 to 100kHz	+5.1V @ 8mA max

ICP-style Piezoelectric Transducers

MODEL NO.	Input Range	Output Range
DI-5BICP-Peak	±5V	±5V
DI-5BICP-RMS	±5V	0 to 3.535V

Isolated True RMS Input Modules (20kHz BW)

MODEL NO.	Input Range	MODEL NO.	Input Range
DI-5B33-01	100mVFS	DI-5B33-04	150VFS
DI-5B33-02	1VFS	DI-5B33-05	300VFS
DI-5B33-03	10VFS		

Linearized RTD Input Modules (4Hz BW)

MODEL NO.	Type	Input Range
For 2- or 3-Wire RTDs		
DI-5B34-01	100Ω Pt	-100°C to +100°C (-148°F to +212°F)
DI-5B34-02	100Ω Pt	0°C to +100°C (+32°F to +212°F)
DI-5B34-03	100Ω Pt	0°C to +200°C (+32°F to +392°F)
DI-5B34-04	100Ω Pt	0°C to +600°C (+32°F to +1112°F)
DI-5B34C-01	10Ω Cu @ 0°C	0°C to +120°C (+32°F to +248°F)
DI-5B34C-02	10Ω Cu @ 25°C	0°C to +120°C (+32°F to +248°F)
DI-5B34C-03	10Ω Cu @ 0°C	0°C to +160°C (+32°F to +320°F)
DI-5B34N-01	120Ω Ni	0°C to +300°C (+32°F to +572°F)
For 4-Wire RTDs		
DI-5B35-01	100Ω Pt	-100°C to +100°C (-148°F to +212°F)
DI-5B35-02	100Ω Pt	0°C to +100°C (+32°F to +212°F)
DI-5B35-03	100Ω Pt	0°C to +200°C (+32°F to +392°F)
DI-5B35-04	100Ω Pt	0°C to +600°C (+32°F to +1112°F)
DI-5B35C-01	10Ω Cu @ 0°C	0°C to +120°C (+32°F to +248°F)
DI-5B35C-02	10Ω Cu @ 25°C	0°C to +120°C (+32°F to +248°F)
DI-5B35C-03	10Ω Cu @ 0°C	0°C to +160°C (+32°F to +320°F)
DI-5B35N-01	120Ω Ni	0°C to +300°C (+32°F to +572°F)

Strain Gage Input Modules (4Hz or 10kHz BW)

MODEL NO.	Full Scale Input/Bridge	Excitation
10kHz		
DI-5B38-01	±10mV/Full, (3mV/V) 100 to 10KΩ	3.333V
DI-5B38-02	±30mV/Full, (3mV/V) 300 to 10KΩ	10.000V
DI-5B38-03	±10mV/Half, (3mV/V) 100 to 10KΩ	3.333V
DI-5B38-04	±30mV/Half, (3mV/V) 300 to 10KΩ	10.000V
DI-5B38-05	±20mV/Full, (2mV/V) 300 to 10KΩ	10.000V
DI-5B38-06	±33.3mV/Full, (10mV/V) 100 to 10KΩ	3.333V
DI-5B38-07	±100mV/Full, (10mV/V) 300 to 10KΩ	10.000V
4Hz		
DI-5B38-31	±10mV/Full, (3mV/V) 100 to 10KΩ	3.333V
DI-5B38-32	±30mV/Full, (3mV/V) 300 to 10KΩ	10.000V
DI-5B38-33	±10mV/Half, (3mV/V) 100 to 10KΩ	3.333V
DI-5B38-34	±30mV/Half, (3mV/V) 300 to 10KΩ	10.000V
DI-5B38-35	±20mV/Full, (2mV/V) 300 to 10KΩ	10.000V
DI-5B38-36	±33.3mV/Full, (10mV/V) 100 to 10KΩ	3.333V
DI-5B38-37	±100mV/Full, (10mV/V) 300 to 10KΩ	10.000V

Analog Current Input Modules (4Hz BW)

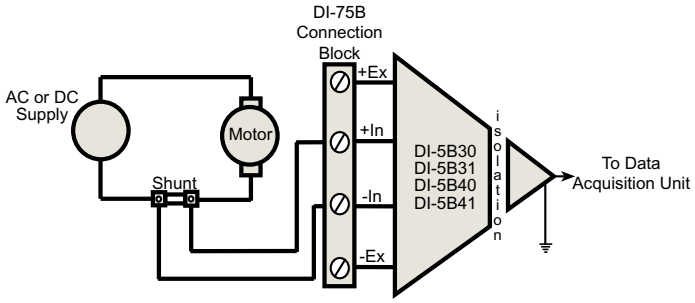
MODEL NO.	Input Range	MODEL NO.	Input Range
DI-5B32-01	4 to 20mA	DI-5B32-02	0 to 20mA

Potentiometer Input Modules (4Hz BW)

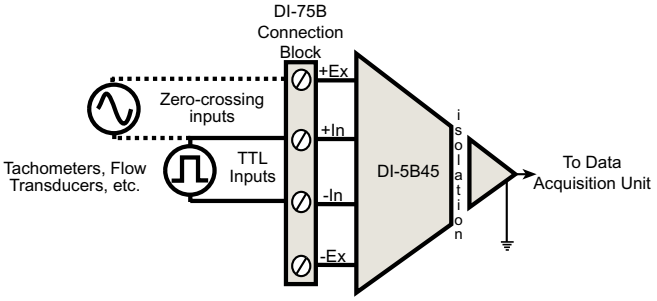
MODEL NO.	Input Range	Excitation
DI-5B36-01	0 to 100Ω	0.25mA
DI-5B36-02	0 to 500Ω	0.25mA
DI-5B36-03	0 to 1KΩ	0.25mA
DI-5B36-04	0 to 10KΩ	0.10mA

Signal Conditioning Module Applications

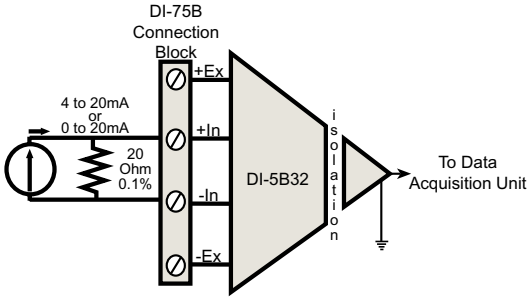
AC or DC Current Shunt:



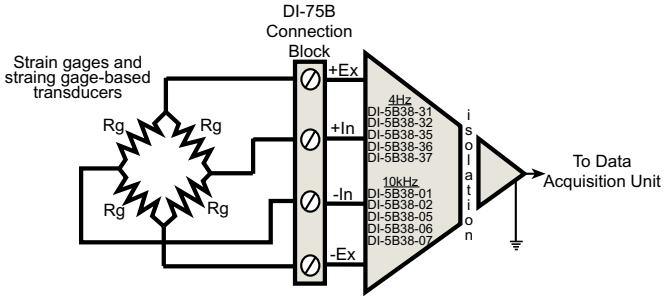
Frequency:



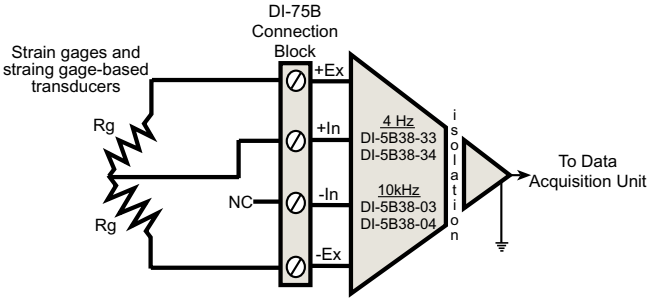
Process Current:



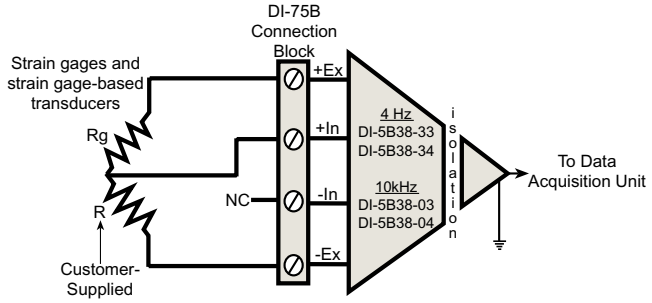
Full-Bridge Strain Gage:



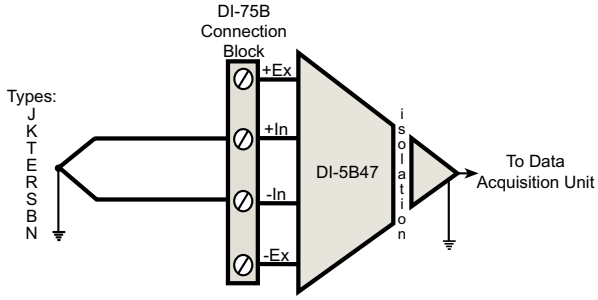
Half-Bridge Strain Gage:



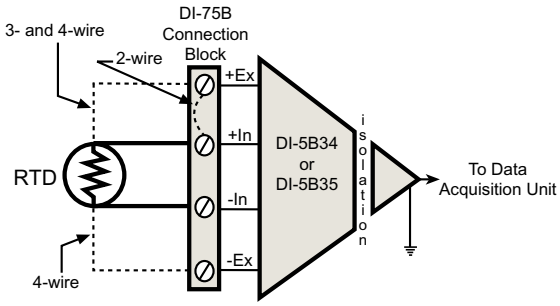
Quarter-Bridge Strain Gage:



Floating Grounded TC:



RTD:



Specifications

	DI-500 Series and DI-750 Series	DI-510 Series and DI-760 Series
Function	A/D with parallel port interface	
Interface	Standard, Bi-directional, or EPP Parallel Port	
Analog Channels	DI-500-16 and DI-750-16—16 signal conditioned channels	DI-510-32 and DI-760-32—32 signal conditioned channels
All Analog Inputs		
Analog Resolution	14-bit, 1 part in ±8192	
Sample Throughput Rate (kHz)	Standard Port—40; Bi-directional Port—80; EPP—250	
Gain Ranges	1, 2, 4, 8 (programmable per channel)	
High Level Analog Inputs		
Type	Differential	
Measurement Range Full Scale	±10VFS @ Av=1	
Common Mode Rejection	80db min @ Av=1	
Gain Accuracy	<0.05%	
Input Offset Voltage	±5 ADC counts	
Input Setting Time	4µs to 0.01% at all gains	
Input Impedance	30kΩ with power on; 20kΩ with power off	
Signal Conditioned Analog Inputs	Defined by DI-5B Modules	
Analog Outputs		
Channels	2	
Resolution	12-bit	
Output Range	±10V	
Current Drive/Impedance	±5mA/0.3Ω	
Digital I/O		
Capacity	8 each input and output	
Compatibility	TTL, 4.7KΩ pull-up in inputs	
Input Scan List	240 elements	
Output Scan List	16 elements	
Triggering		
Pre-trigger length	64K samples	
Post-trigger length	64K samples	
Trigger channel	Any channel	
Trigger level hysteresis	8-bit (256 counts)	
Power Requirements	700mA @ 12VDC typical, excluding DI-5B modules	1000mA @ 12VDC typical, excluding DI-5B modules
Power Supply Voltage Range	9 to 36VDC	
Physical		
Dimensions	DI-500 Series: 19.5"W × 15.25"D × 7.5"H DI-750 Series: 16.88"W × 3.5"D × 16.7"H	DI-510 Series: 24"W × 20.5"D × 8.25"H DI-760 Series: 16.88"W × 3.5"D × 16.7"H
Weight	DI-500 Series: 12lbs. (excluding DI-5B modules) DI-750 Series: 6 lbs. (excluding DI-5B modules)	DI-510 Series: 16 lbs. (excluding DI-5B modules) DI-760 Series: 10 lbs. (excluding DI-5B modules)
Operating Environment	0° to 70°C; 5% to 90% RH noncondensing	
Storage Environment	-55° to 150°C; 5% to 90% noncondensing	

Ordering Guide

Description	Order Number	Description	Order Number
DI-500-16 Portable 16-channel instrument with one 16-channel DI-5B module backplane.	DI-500-16-P	**DI-750-16** Desktop/Rackmount 16-channel instrument with one 16-channel DI-5B module backplane.	DI-750-16-D
DI-510-32 Portable 32-channel instrument with two 16-channel DI-5B module backplane.	DI-510-32-P	**DI-760-32** Desktop/Rackmount 32-channel instrument with 2 16-channel DI-5B module backplanes.	DI-760-32-D

Data Acquisition Product Links
(click on text to jump to page)
Data Acquisition | Data Logger | Chart Recorder | Thermocouple | Oscilloscope

DATAQ® INSTRUMENTS
241 Springside Drive
Akron, Ohio 44333
330-668-1444