

DI-715B 5B Module Data Logger System



**Stand-alone Data Logger
Option Allows Data to be
Saved to Removable SD
Memory**

**Accepts Fully Isolated
Plug-In Amplifiers**

**8 Analog Input Channels
Expandable to 16 with the
DI-75B Backpack**

The DI-715B is an eight-channel, signal conditioned Ethernet (USB to Ethernet converter available) data logger/data acquisition system. Each DI-715B accepts up to eight isolated, plug-in (DI-5B) signal conditioning modules to include virtually any isolated, industrial-type signal. Because DI-5B modules are identical in pinout and size, they can be mixed or matched in any combination. Choose from thermocouple, true rms, voltage, strain, frequency, process current, RTD, potentiometric, or DC transducer—whatever suits your application. A clear acrylic front panel allows easy identification of all installed 5B modules. Over 90 models available—see page 6 for a complete listing.

The DI-715B Series provides the option of PC-connected or stand-alone data logger operation. Instruments with the stand-alone data logger option feature a built-in socket that accepts standard Secure Digital (SD) memories to which acquired data may be stored without a connected PC. SD memories are the same commonly available mass storage devices used with digital cameras and MP3 players. Memories ranging in size from 16MB to 2GB are supported. Instruments without this option must remain tethered to a PC's Ethernet port during data acquisition and use the PC's own program and memory to store acquired data. Software selectable gain ranges of 1, 2, 4, and 8 are supported.

Expand the DI-715B to 16 channels with one DI-75B Backpack using optional stacking brackets and handles.



DI-75B with 3 DI-5B modules installed. A clear acrylic front panel allows easy identification of all installed 5B modules.

Features

Make Industrial Measurements Through DI-5B Plug-in Signal Conditioning Modules

Each channel on the DI-715B accommodates one DI-5B module providing a single channel of isolated input protection, amplification, and filtering. DI-5B modules are plugged into a socketed backplane and are secured with a mounting screw. Each DI-715B channel has four screw terminals for signal connections: channel +, channel-, excitation +, and excitation -. These terminals satisfy all transducer inputs and provide sensor excitation if necessary. Access to the DI-5B modules is through a removable front panel.

Stand-alone Data Logger Operation

Use an SD Card to record and store data—up to 2GB. A FIFO memory configuration allows the DI-715B to record continuously using a circular buffer or record-until-full approach. A push button allows manual start/stop control over the recording process. A multi color LED shows instrument status (Record, Standby, Busy, Error).

High Throughput Rate

Supports sample throughput rates up to 4800 samples/sec to PC (depending on host computer speed) or up to 14400 samples/sec to memory card (stand-alone data loggers).

Expandable

Add 8 more signal-conditioned channels with a DI-75B 5B Module backpack. Fully mountable with optional stacking brackets.

High Resolution

14-bit resolution analog to digital conversion provides a responsive instrument capable of registering changes as small as one part in 8,192 ($\pm 0.012\%$ of the full scale measurement range).

Convenient Signal Connection

A 32 position removable screw terminal block allows signal connections to be made to the DI-715B.

File Protection

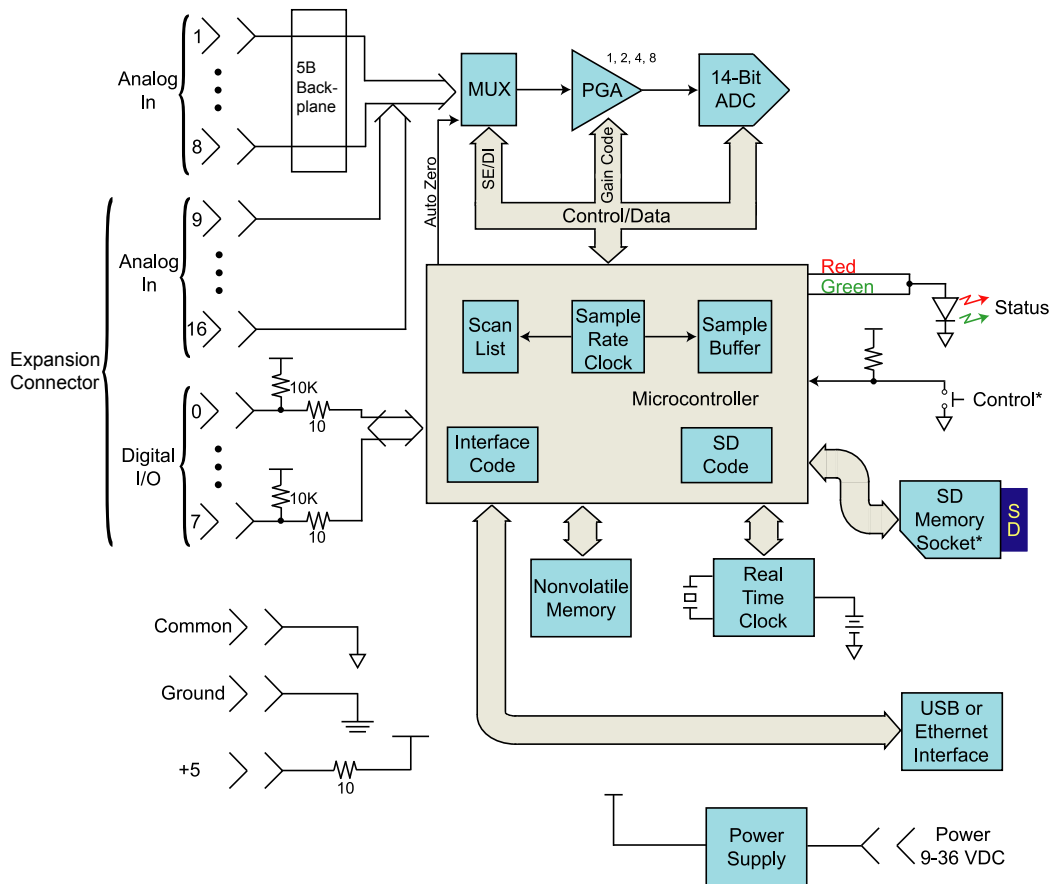
When powered down unexpectedly, the DI-715B Stand-alone model retains all acquired data on its memory card.

Includes Software

Be up and running minutes out of the box with WINDAQ software. WINDAQ/Lite Recording and Playback software is included free with the purchase of every DI-715B instrument. Record at rates up to 1000 Hz using WINDAQ/Lite Acquisition software. WINDAQ/High Speed option allows you to record data as fast as the instrument will allow. Use WINDAQ Playback software (WWB) to review, measure, and analyze your data.

DATAQ Instruments Hardware Manager Software allows you to effectively manage and run multiple units installed to your PC, your network, or even over the Internet. It includes configuration software for stand-alone data loggers allowing a complete data acquisition configuration to be designed and downloaded from any local or remote PC. Upload software allows you to read data stored to an SD card over the DI-710's Ethernet interface.

DI-715B Block Diagram



*Stand Alone Models Only

DI-715B Rear Panel

Expansion Port

Provides access to channels 9 to 16. Connect a DI-75B for signal conditioned inputs or use a DI-705 for direct connections (see page 4).

Removable Screw Terminal Block

Connect signal leads to this screw terminal block. Channel +, Channel -, Excitation +, and Excitation - for each channel.

Interface

Ethernet port only available.

Power Jack and Power Button

May be powered by the provided AC adaptor, or from any 9-36 VDC source.

Removable Storage Slot

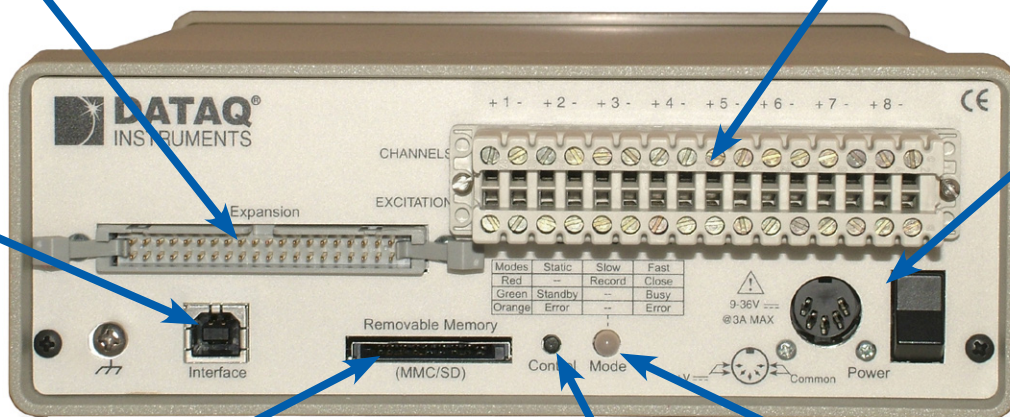
Accommodates standard and readily available multi-media memory cards for mass storage. These are the same memories used by consumer electronic devices like MP3 players and digital cameras. Accepts memory sizes from 16MB to 2GB.

"Control" Pushbutton

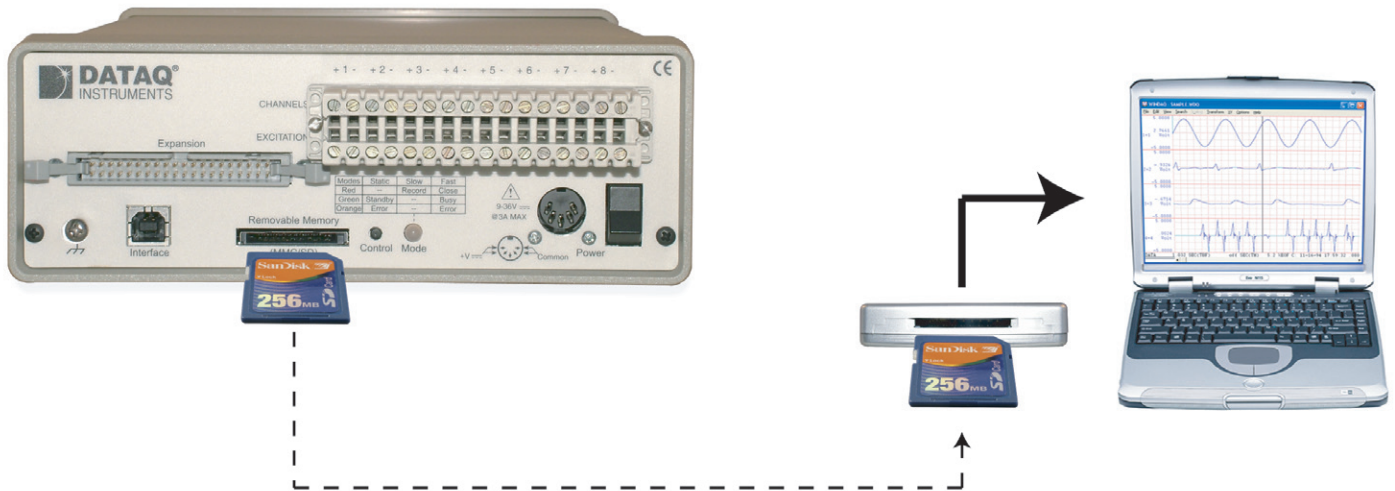
Allows manual start/stop local control over the recording process and instrument configuration.

"Mode" LED

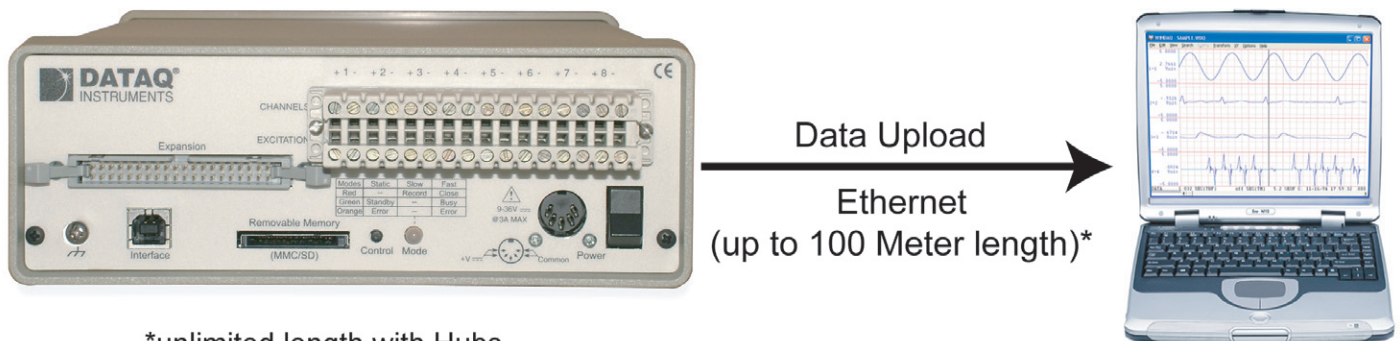
Tri-color LED indicates instrument status: Standby, Recording, Error.



Stand-alone Data Transport Methods



Physically Transport Memory Card
Remove SD and place in Reader



*unlimited length with Hubs

Three Measurement Configurations

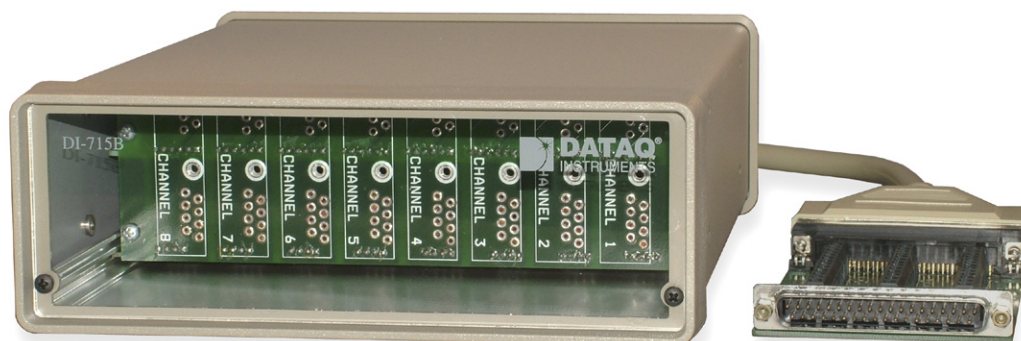


Eight signal-conditioned inputs

This configuration is the simplest form of the DI-715B, but offers tremendous flexibility in terms of the range of signal types that can be measured. The 715B can be populated with up to eight 5B signal conditioning modules that can be mixed and matched to precisely tailor the instrument to any application. 5B modules provide both input-to-output and channel-to-channel isolation, so the 715B can be applied in literally any industrial measurement setting with complete safety.

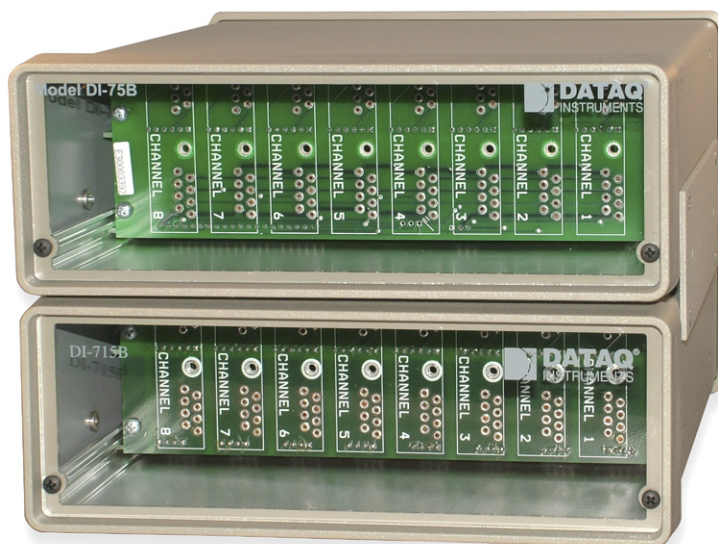
Eight signal-conditioned and eight direct inputs

This configuration adds an adaptor cable (model CABL-7), a screw terminal access card (model DI-705), and an optional six-foot extension cable (CABL-5) to allow access to an additional eight analog input channels, and eight digital I/O lines. The incremental eight analog channels are single-ended and connect directly to the 715B's internal analog to digital converter. Each channel may be independently programmed for a ± 10 , ± 5 , ± 2.5 , or ± 1.25 full scale voltage measurement range.



Sixteen signal-conditioned inputs

Adding a model DI-75B 5B amplifier backpack to a DI-715B yields a sixteen-channel solution that accepts mixed and matched 5B amplifiers to address any industrial application. Like the eight-channel solution provided by the DI-715B alone, all sixteen channels are fully isolated for safety and measurement flexibility.



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 90 modules address the full spectrum of industrial measurements.

Key Features

- 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

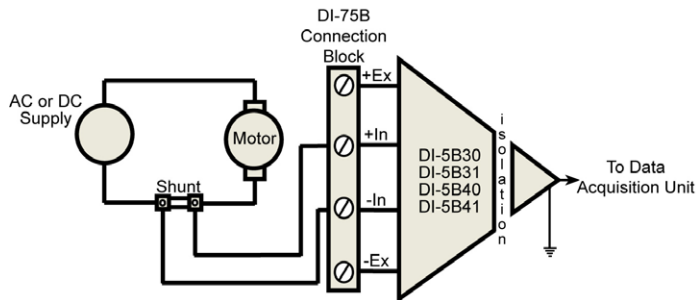
- 1000V isolation (if requirements exceed 600V contact DATAQ Instruments)
- 240 VAC input protection
- 160db common mode rejection
- -40°C to +85°C operating temperature range
- Small size: 2.28" × 2.26" × 0.60"

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
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
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)	
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	
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

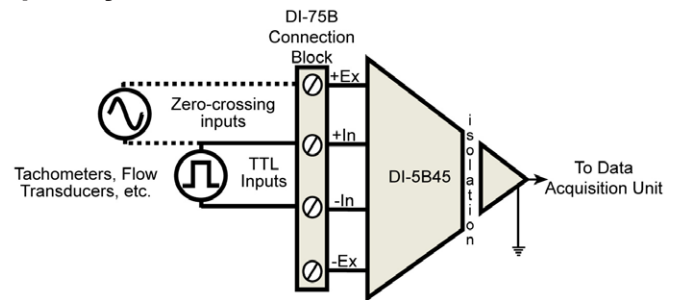
Strain Gage Input Modules (4Hz or 10kHz BW)			
MODEL NO.	Full Scale Input/Bridge		Excitation
10kHz			
DI-5B38-01	±10mV/Full, (3mV/V) 100 to 10KΩ		3.333V
DI-5B38-02	±30mV/Full, (3mV/V) 300 to 10KΩ		10.000V
DI-5B38-03	±10mV/Half, (3mV/V) 100 to 10KΩ		3.333V
DI-5B38-04	±30mV/Half, (3mV/V) 300 to 10KΩ		10.000V
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
2-wire Transmitter Interface Module (100Hz BW)			
MODEL NO.	Input Range	Excitation	
DI-5B42-01	4 to 20mA	Nom. 20V at 4 to 20mA	
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	
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)	
ICP-style Piezoelectric Transducers			
MODEL NO.	Input Range	Output Range	
DI-5BICP-Peak	±5V	±5V	
DI-5BICP-RMS	±5V	0 to 3.535V	
Accelerometer Input Module			
MODEL NO.	Input Range	Output Range	Bandwidth
DI-5B48-01	±10V max	±10V	2.5kHz to 20kHz

Signal Conditioning Module Applications

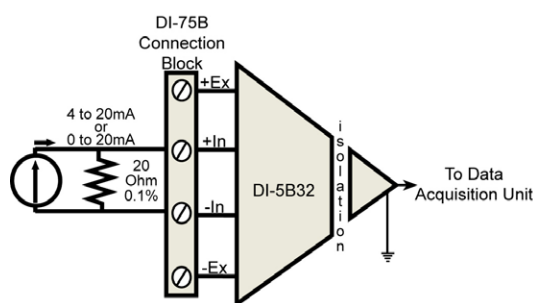
AC or DC Current Shunt:



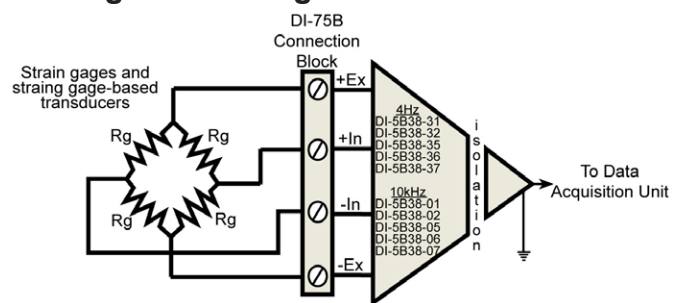
Frequency:



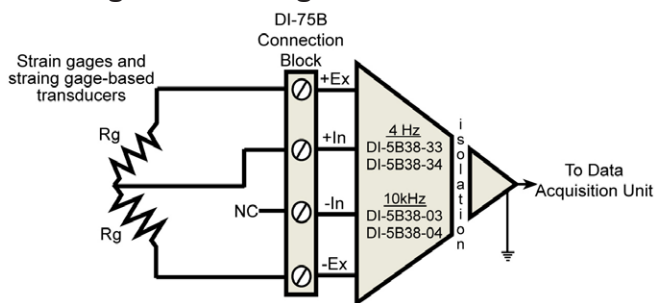
Process Current:



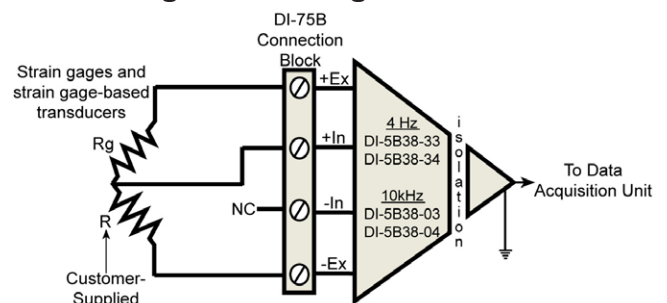
Full-Bridge Strain Gage:



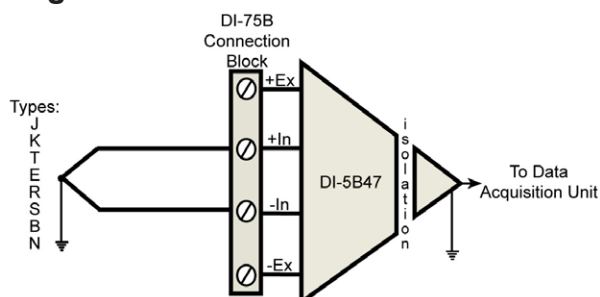
Half-Bridge Strain Gage:



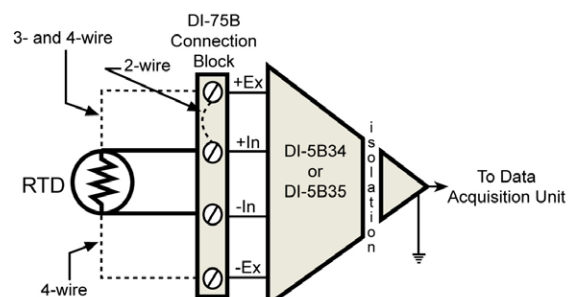
Quarter-Bridge Strain Gage:



Floating Grounded TC:



RTD:



DI-715B Specifications

Analog Inputs

Number of Channels: 8 signal conditioned and isolated; 8 direct

Channel Configuration: Single-ended

Measurement range, Accuracy, and Resolution

Gain	Range	Accuracy**	Resolution
1	±10V	±.05%FSR ±50µV	±1.22mV
2	±5V	±.05%FSR ±50µV	±610µV
4	±2.5V	±.05%FSR ±50µV	±305µV
8	±1.25V	±.05%FSR ±50µV	±153µV

Input Impedance, single-ended: 1MΩ*

Input bias current: 10µA for a 10V input, single channel*

Input offset voltage: Auto-zero*

Input offset current: 2nA (single channel)*

Max. normal mode voltage: 30V DC or peak AC*

Channel-to-channel crosstalk rejection: -75db @ 100Ω unbalance*

Gain temperature coefficient: 50 ppm/°C*

Offset temperature coefficient: 0.25µV/°C*

Digital filtering: Standard: Conditional over-sampling
Stand-alone: None*

*Specs are for the unit itself (without the 5B module). See the specific 5B module data sheet for its specifications.

**Test conditions: Single channel, 100S/s, Averaging mode. Accuracy spec does not include 5B module error or CJC error.

A/D Characteristics

Type: Successive approximation

Resolution: 14-bit

Monotonicity: ±2 LSB

Conversion Time: 69µs

Scanning Characteristics

Max. throughput sample rate: Standard: 4,800 Hz
Stand-alone: 14,400 Hz (assumes SD memory latencies of 80 milliseconds or less)

Min. throughput sample rate: Standard: 0.0034 Hz
Stand-alone: 0.0017 Hz

Max. scan list size: 17 entries

Sample buffer size: 2kb

Indicators

Stand-alone models: Three-color LED indicating Record, Standby, and Error conditions

Standard models: Power LED

Calibration

Calibration cycle: One year

Calibration method: Calibration Software, provided.

Digital I/O

Bits: 8 bidirectional bits

Configuration: Each bit is programmable as Input or Output

Output voltage levels: Min. "1" 3V @ 2.5mA sourcing
Max. "0" 0.4V @ 2.5mA sinking

Output current: Max. source, -2.5 mA; Max. sink, 2.5mA

Input voltage levels: Min. required "1" 2V; Max allowed "0" 0.8V

Ethernet Interface

Type: 10/100Base-T

Connector: RJ-45

Protocol: TCP/IP

Server Type: DHCP

Removable Memory (Stand-alone models)

Type: SD (Recommended: Lexar Professional 133X)

Capacity: 16MB to 2GB

Real Time Clock (Stand-alone models)

Type: Date, hour, minute, second

Resolution: 1 second

Accuracy: 20 ppm

Controls (Stand-alone models)

Single push-button: Provides manual control over Record and Standby

Transfer Rate to PC

Real Time: up to 4,800 samples per second

From Memory Card: up to 2,400 samples per second

General

Panel indicators: Mode LED

Panel Controls: Control push button (Stand-alone models)

Panel Slots: Accepts MMC/SD-type flash memory

Input connectors: Two, removable sixteen position terminal blocks

Operating Environment: 0°C to 70°C

Enclosure: Aluminum base with steel wrap-around. Clear acrylic front panel.

Dimensions: 9"L × 7.29"W × 2.7"H
22.86L × 18.52W × 6.86H cm.

Weight: 3 lbs. (1.36 kg.)

Power Requirements: Ethernet: 9 to 36 VDC, 2.5 watts + 5B modules

Ordering Guide

Description	Order No.	Description	Order No.
DI-715B-E Ethernet Instrument Low cost, portable, Ethernet data logger featuring throughput rates up to 4800 Hz, 8 5B Module inputs inputs and programmable gain ranges of 1, 2, 4, and 8.	DI-715B-E	DI-715B-ES Ethernet Stand-alone Instrument Low cost, portable, Ethernet data logger featuring stand-alone capability, throughput rates up to 14400 Hz, 8 5B Module inputs inputs and programmable gain ranges of 1, 2, 4, and 8.	DI-715B-ES
WinDAQ High Speed Special High-Speed version of WinDAQ/Lite. Record at the speed of the instrument when acquiring directly to a PC. Not required when acquiring to built-in memory.	WinDAQ/HS-715B	101014-EA External USB to Ethernet converter. Allows you to connect your DI-715B to your USB port.	101014-EA



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Data Acquisition Product Links

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