



# ***DI-4718B***

***8-Channel USB or Ethernet Data Logger for DI-8B Modules***

## ***User's Manual*** ***Manual Revision D***

Copyright © 2021 by DATAQ Instruments, Inc. The Information contained herein is the exclusive property of DATAQ Instruments, Inc., except as otherwise indicated and shall not be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise without expressed written authorization from the company. The distribution of this material outside the company may occur only as authorized by the company in writing.

DATAQ Instruments' hardware and software products are not designed to be used in the diagnosis and treatment of humans, nor are they to be used as critical components in any life-support systems whose failure to perform can reasonably be expected to cause significant injury to humans.

DATAQ, the DATAQ logo, and WINDAQ are registered trademarks of DATAQ Instruments, Inc. All rights reserved.



DATAQ Instruments, Inc.  
241 Springside Drive  
Akron, Ohio 44333 U.S.A.  
Telephone: 330-668-1444  
Fax: 330-666-5434

Designed and manufactured in the  
United States of America



# Warranty and Service Policy

## Product Warranty

DATAQ Instruments, Inc. warrants that this hardware will be free from defects in materials and workmanship under normal use and service for a period of 1 year from the date of shipment. DATAQ Instruments' obligations under this warranty shall not arise until the defective material is shipped freight prepaid to DATAQ Instruments. The only responsibility of DATAQ Instruments under this warranty is to repair or replace, at its discretion and on a free of charge basis, the defective material.

This warranty does not extend to products that have been repaired or altered by persons other than DATAQ Instruments employees, or products that have been subjected to misuse, neglect, improper installation, or accident.

DATAQ Instruments shall have no liability for incidental or consequential damages of any kind arising out of the sale, installation, or use of its products.

## Service Policy

1. All products returned to DATAQ Instruments for service, regardless of warranty status, must be on a freight-prepaid basis.
2. DATAQ Instruments will repair or replace any defective product within 5 days of its receipt.
3. For in-warranty repairs, DATAQ Instruments will return repaired items to the buyer freight prepaid. Out of warranty repairs will be returned with freight prepaid and added to the service invoice.



---

# Table of Contents

<b>Warranty and Service Policy .....</b>	<b>iii</b>
<b>1. Introduction .....</b>	<b>1</b>
Features .....	1
Analog Inputs .....	1
Digital I/O .....	1
Software .....	2
WinDaq® Recording and Playback Software .....	2
Help .....	2
<b>2. Specifications .....</b>	<b>3</b>
<b>3. Installation .....</b>	<b>7</b>
Install WinDaq Software and the WinDaq Dashboard .....	7
Software Installation .....	7
<b>4. Instrument Controls, Indicators, and Connections .....</b>	<b>9</b>
Instrument Front Panel .....	9
Signal Connections .....	9
Installing DI-8B Modules .....	10
Enabling CJC for Thermocouple Modules .....	11
Connecting Signals .....	12
Low-pass Filter .....	12
Resolution as a Function of Sample Rate .....	13
Built-In Remote Control Jack .....	14
WinDaq Remote Events .....	14
WinDaq Remote Storage .....	15
General Purpose Digital Inputs .....	15
Instrument Rear Panel .....	16
Power Input Jack .....	16
Ground Lug .....	16
Ethernet Port .....	16
Mini-B USB Port .....	16
USB Drive Port .....	16
Status LED .....	16
Control Button .....	17
Control Button Operations .....	17
Record Data to USB Thumb Drive .....	17
Stop Recording to USB Thumb Drive .....	17
Fix Errors .....	17
Switching between LibUSB and CDC Modes .....	17
Save Ethernet and Stand-alone Configuration to Thumb Drive .....	17
Apply Ethernet and Stand-alone Configuration to Device .....	18
Mode LED Indicator .....	18
WinDaq Dashboard .....	20
ChannelStretch™ .....	21
Connection .....	22
Channel Selection .....	23
<b>5. Unlock SA-Enabled .....</b>	<b>25</b>

<b>6. Dimensional Drawing .....</b>	<b>27</b>
<b>7. DI-8B Modules .....</b>	<b>29</b>
DI-8B30/31 Analog Voltage Input Modules, 3Hz Bandwidth .....	29
DI-8B32 Analog Current Input Modules .....	30
DI-8B33 True RMS Input Modules .....	31
DI-8B34 Linearized 2- or 3-Wire RTD Input Modules .....	32
DI-8B35 Linearized 4-Wire RTD Input Modules .....	33
DI-8B36 Potentiometer Input Modules .....	34
DI-8B38 Strain Gage Input Modules, Narrow & Wide Bandwidth .....	35
DI-8B40/41 Analog Voltage Input Modules, 1kHz Bandwidth .....	36
DI-8B42 2-Wire Transmitter Interface Modules .....	37
DI-8B43 DC LVDT Input Modules .....	38
DI-8B45 Frequency Input Modules .....	39
DI-8B47 Linearized Thermocouple Input Modules .....	40
DI-8B50/51 Analog Voltage Input Modules, 20kHz Bandwidth .....	41

---

# 1. Introduction

This manual contains information designed to familiarize you with the features and functions of the DI-4718B data acquisition systems.

## Features

DI-4718B series instruments are extremely versatile with multiple interface options, high resolution, expandability with ChannelStretch™, and fast throughput rates. Features include:

- Accepts up to 8 DI-8B amplifier modules accommodating virtually any industrial signal.
- USB, Ethernet, and Power over Ethernet (PoE) interface options.
- Ethernet models can be used as USB devices.
- Up to 16-bit measurement resolution.
- Up to 160,000 Samples per second maximum throughput rate.
- Adaptable low-pass filter per channel - corner frequency set as a function of sampling rate.
- A multi-purpose push-button for WINDAQ remote events and start/stop recording.
- LED indication for easy notification of device status.
- Free WinDaq/Lite data acquisition recording and playback software.
- ChannelStretch™ Technology allows you to sync up to 16 DI-1120, DI-4108, DI-4208, or DI-4718B instruments in any combination (requires same communications interface) with a total throughput of 480,000 samples per second throughput, or more (requires unlock code for each device).\*
- Stand-alone option allows the user to configure a recording session through their PC then record data in the field to removable flash memory via the USB drive port (**without** being connected to their PC). ChannelStretch™ not supported in stand-alone mode. Stand-alone data logging requires Unlock code to record more than 1 channel to removable flash memory.
- Included .Net Class supports programming under any .Net programming language.\*
- Fully documented instrument protocol for programming the device in operating systems other than Windows.

\*WinDaq/Unlock required per device to use ChannelStretch™ when using WinDaq software. These restrictions do not apply when programming the device yourself. ChannelStretch is not supported when recording to removable flash memory.

## Analog Inputs

DI-4718B models provide 8 fixed analog inputs designed specifically for DI-8B amplifiers that allow your analog signals to be converted into 12 to 16-bit digital data via an on board A/D converter.

Utilize the functionality of WINDAQ software to experience all the features in these versatile instruments. An Unlock Code is required to synchronize multiple units when using WinDaq software. There are no restrictions when programming the instruments yourself. An unlock code is also required to record more than a single channel to removable flash memory.

## Digital I/O

The DI-4718B provides two digital input channels for Remote Control Operations (Remote Start/Stop and Remote Events) that may be accessed using the Built-In Remote Control Jack (see “Built-In Remote Control Jack” on

page 14). Remote Control configuration and setup is easily accessible in both WINDAQ Acquisition software and in the Dataq Instruments Hardware Manager (when configuring the instrument for Stand-alone operation).

## Software

All software required to record and playback waveforms is included with the purchase of any DI-4718B data acquisition system. Software is located on the USB thumb drive included with your instrument or via the internet at [run.dataq.com](http://run.dataq.com).

### ***WINDAQ® Recording and Playback Software***

WINDAQ Acquisition and WINDAQ Waveform Browser allow you to record and playback data acquired through your instrument. WINDAQ software is an invaluable resource to record and analyze your data and is available for free from our web site ([www.dataq.com](http://www.dataq.com)).

WINDAQ Lite Data Acquisition software (free) can be used to record waveforms directly and continuously to disk while monitoring a real time display of the waveforms on-screen. It operates, displays, and records data in real time when connected to your PC. An optional unlock code is available to sync multiple units into a single WinDaq file.

WINDAQ Waveform Browser playback software (also known as “WWB”) offers an easy way to review and analyze acquired waveforms. A built-in data file translator allows the user to display multiple waveforms acquired by WINDAQ Acquisition software or any of a wide range of data acquisition packages. The software’s disk-streaming design allows data files of any length to be graphically displayed rapidly, in normal or reverse time directions. Seven standard cursor-based measurements, frequency domain, and statistical analysis functions help simplify waveform analysis and interpretation. WINDAQ Waveform Browser is free and installed when installing WINDAQ Software.

### ***Help***

All WINDAQ software utilizes context-sensitive help. Help may be accessed through the Help menu or by pressing the F1 key with any pull-down menu item selected. This will take you directly to the Help topic most relevant to that particular function or feature. Help topics discuss in detail each function available in the software.



## 2. Specifications

### **Analog Inputs**

Number of Channels:	8 configured for signal conditioned inputs
Channel Configuration:	Defined by DI-8B Module
Measurement range per channel:	Defined by DI-8B Module
Accuracy:	$\pm 0.25\%$ FSR (at 1800 S/s, averaging mode)
Input impedance:	Defined by DI-8B Module
Input offset voltage:	Defined by DI-8B Module
Channel-to-channel crosstalk rejection:	-75db @ 100 $\Omega$ unbalance
Offset temperature coefficient:	0.25 $\mu$ V/ $^{\circ}$ C
Digital filtering:	Standard: Conditional over-sampling Stand-alone: None
CJC Error:	1.5 $^{\circ}$ C plus 8B Module

### **Isolation (via DI-8B Modules)**

Input-to-Output:	1000VDC/Peak AC
Channel-to-Channel:	500VDC/Peak AC

### **Digital Inputs**

Ports:	2
Maximum drain voltage:	25 V
Maximum sink current:	100 mA
Reserved Digital Inputs:	D0: WinDaq Remote Events D1: WinDaq Remote Start/Stop

### **A/D Characteristics**

Type:	Successive approximation
Resolution:	12 to 16-bit
Conversion Time:	69.4 $\mu$ s

### **Scanning Characteristics**

Max. throughput sample rate:	Standard: 160 kHz Stand-alone: 20 kHz to 160 kHz (dependent on flash memory)
Min. throughput sample rate:	Standard: 20 Hz (2.2 samples per hour with WinDaq) Stand-alone: 0.0017 Hz
Sample Rate Timing Accuracy:	100 ppm
Max. scan list size:	9 entries
Sample buffer size:	2kb

**Calibration**

Calibration cycle: One year

**Ethernet Interface**

Type: 10/100Base-T  
Connector: RJ-45  
Protocol: TCP/IP  
Server Type: DHCP or Fixed IP

**Removable Memory**

Type: MLC, pSLC, or SLC flash memory (with USB SD card reader); USB thumb drive  
Required Format: FAT32  
Number of Channels: 1; Unlock code required for 2 or more

**Rear Panel Indicators, Connections, and Controls**

Button: Multi-function control (Start, Stop, Save Configuration, Apply Configuration)  
USB A Connector (Drive): USB drive for Stand-alone data logging  
Cannot be used concurrently with the USB interface  
Ground Lug: Terminal for Ground  
Status LED: One multicolor LED for status indication  
Power Connector: USB: 9 to 36 VDC, 2 watts + 8B modules  
Ethernet: 9 to 36 VDC, 2.5 watts + 8B modules  
Ethernet Connector: RJ45; Optional PoE

**Front Panel Connections**

Input connectors: Two, removable sixteen position terminal blocks, 28 AWG min, 16 AWG max  
Radio Jack: Standard 3.5 mm for remote control signals

**USB ChannelStretch™ Operation**

Total Max Units: 16  
Max Channel Count: 128 Analog, 112 Digital  
Max Throughput:  $\geq 480$  kHz (higher speeds may result in data loss)  
Synchronization Conditions: Syncs with any combination of DI-1120, DI-4108, and DI-4208 USB instruments.  
All synced instruments must operate at the same sample rate per channel, regardless of channel number, type, or range.  
All instruments must be connected to the same USB controller. The use of USB hubs are recommended to meet this requirement.

**Ethernet ChannelStretch™ Operation**

Total Max Units: 16

---

Max Channel Count:	128 Analog, 112 Digital
Max Throughput:	≥50 kHz (higher speeds may result in data loss)
Synchronization Conditions:	Syncs with any combination of DI-1120, DI-4108, and DI-4208 Ethernet instruments. For most accurate synchronization, all instruments should be connected to the same Ethernet switch.

**Power**

Power Consumption:	1.5W + 8B Modules
--------------------	-------------------

**Environmental**

Operating Temperature:	0°C to 50°C (32°F to 122°F)
Operating Humidity:	0 to 90% non-condensing
Storage Temperature:	-20°C to 60°C (-4°F to 140°F)
Storage Humidity:	0 to 90% non-condensing

**Physical Characteristics**

Enclosure:	Aluminum base with steel wrap-around.
Mounting:	Desktop; bulkhead
Dimensions:	5 7/16 "D × 4 1/8 "W × 1 1/2 "H (13.81D × 10.48W × 3.81H cm.)
Weight:	14 oz.
Power Requirements:	USB: 9 to 36 VDC, 2 watts + 8B modules Ethernet: 9 to 36 VDC, 2.5 watts + 8B modules

**Software Support**

WINDAQ software:	OS support: Check online at <a href="http://www.dataq.com/products/windaq/windows-compatibility/">http://www.dataq.com/products/windaq/windows-compatibility/</a>
Programming:	<a href="#">Instrument Protocol</a> , .NET class, ActiveX Control



---

## 3. Installation

The following items are included with each DI-4718B Data Acquisition System. Verify that you have the following:

- A DI-4718B data acquisition instrument.
- Communications cable.
- A DATAQ Instruments screwdriver for signal lead connections.
- A USB flash drive with WinDaq software. Can also be used for stand-alone data logging.

If an item is missing or damaged, call DATAQ Instruments at 330-668-1444. We will guide you through the appropriate steps for replacing missing or damaged items. Save the original packing material in the unlikely event that your unit must, for any reason, be sent back to DATAQ Instruments.

### Install WINDAQ Software and the WinDaq Dashboard

All software for the DI-4718B can be installed via a download-able executable directly from the DATAQ Instruments web site. The software is also available on the provided USB flash drive.

#### **Software Installation**

1. Disconnect all DATAQ Instruments USB devices from your Computer.



2. Plug the USB flash drive into your computer's USB port or Go to <http://run.dataq.com>.
3. Save the executable (Dataq Software Suite Web Setup.exe) to your local hard drive.
4. Double-click on the executable to extract the program and begin software installation.
5. Follow the on-screen prompts and enter all required information.

6. Software installation is complete - you will now see a “Successful Installation” box - click **OK** to exit WINDAQ Installation.

You may now connect the device to your PC and apply power. All DI-4718B versions can be connected to your computer’s USB port using the provided USB cable for configuration. Ethernet models can also be connected to your computer anywhere on your subnet. Click on the desktop shortcut icon labeled WinDaq Dashboard or click on the appropriate program group (specified above — default is Start > Programs > WINDAQ) and click on “WinDaq Dashboard” to access your device.

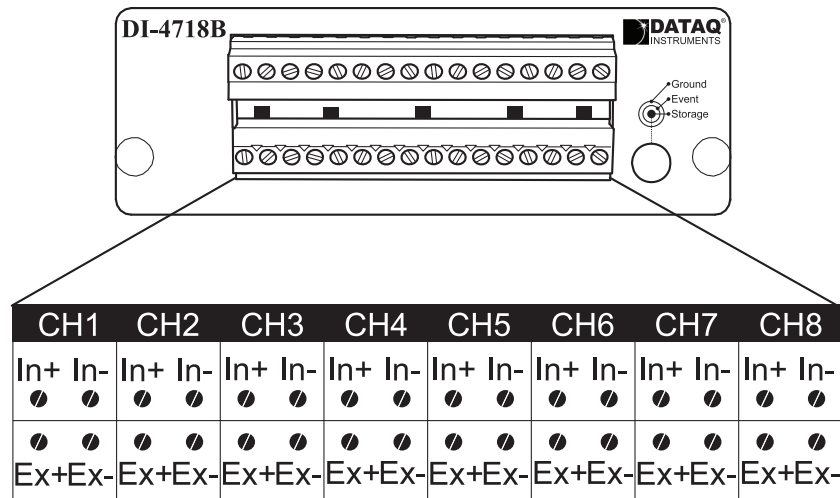
# 4. Instrument Controls, Indicators, and Connections

## Instrument Front Panel

The front panel of DI-4718B instruments provide screw terminal connection ports for analog input signal leads. The front panel also provides remote events and stop/start remote recording control features via a built-in remote control jack.

### Signal Connections

The two 16-port screw terminals on the front of the instrument are used to interface analog input channels 1 through 8. Each channel has four terminals: In+, In-, Ex+, and Ex- for input signals and excitation (if required). Use the sticker located on the top of your instrument for quick reference to terminal access port designations.



## ⚠ CAUTION ⚠

Never touch exposed screw terminal connector pins or screws.

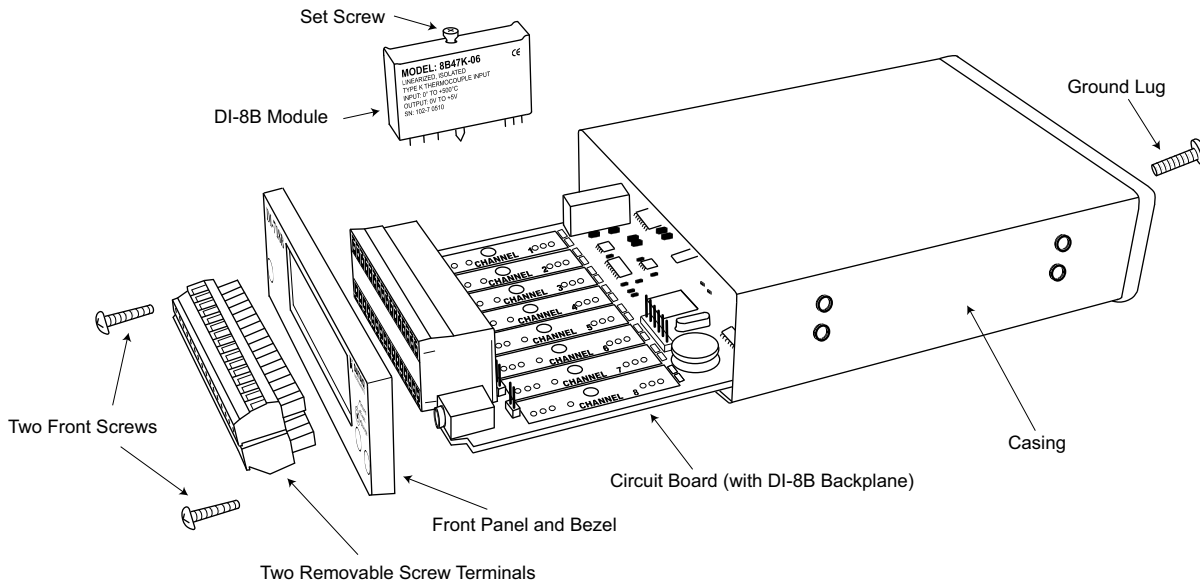
To avoid ESD damage in handling the device, take the following precautions:

Ground yourself with a grounding strap or by touching a grounded object before and during your handling of the instrument.

## Installing DI-8B Modules

DI-4718B Series instruments can accept up to eight DI-8B modules. Modules are installed to the DI-8B backplane located on the instrument circuit board. You must remove the front panel and bezel and the ground lug on the rear of the instrument to access the DI-8B backplane.

1. CAUTION: Avoid ESD damage by grounding yourself with a grounding strap or by touching a grounded object before and during handling of the instrument.
2. Unplug the device and make sure there is no power to the instrument.
3. Remove the two screw terminal blocks on the front of the instrument.
4. Remove the front panel and bezel by removing the two outside screws on the front of the instrument.
5. Remove the Ground Lug located on the back of the instrument.
6. Pull the circuit board apart from the casing to reveal the DI-8B backplane.



7. Plug the DI-8B module firmly into one of the channel positions clearly labelled on the backplane and secure with the set screw. DI-8B modules are installed on (or removed from) the socketed DI-8B backplane (located on the circuit board) and are secured with a non-removable mounting screw. Each channel position is labeled “CHANNEL 1,” “CHANNEL 2,” etc. on the socketed backplane. The DI-8B modules can be mixed or matched in any combination suitable for the application and are identical in pinout and size, so it doesn't matter which module gets plugged into which channel position.
8. Using an erasable pencil write the module number of each DI-8B module installed on the sticker located on the top of the instrument to indicate which module is installed at each channel position.

Write Installed Modules in the spaces provided with an erasable pencil.

Screw Terminal Access															
CH1		CH2		CH3		CH4		CH5		CH6		CH7		CH8	
In+	In-	In+	In-	In+	In-	In+	In-	In+	In-	In+	In-	In+	In-	In+	In-
Ex+	Ex-	Ex+	Ex-	Ex+	Ex-	Ex+	Ex-	Ex+	Ex-	Ex+	Ex-	Ex+	Ex-	Ex+	Ex-
Modules Installed															



9. After all modules are installed and indicated on the sticker reassemble the instrument making sure not to over-tighten the front screws. **Note:** *If you are installing a thermocouple module you must enable the Cold Junction Compensation jumper for that channel (see “Enabling CJC for Thermocouple Modules” section below for more information).*

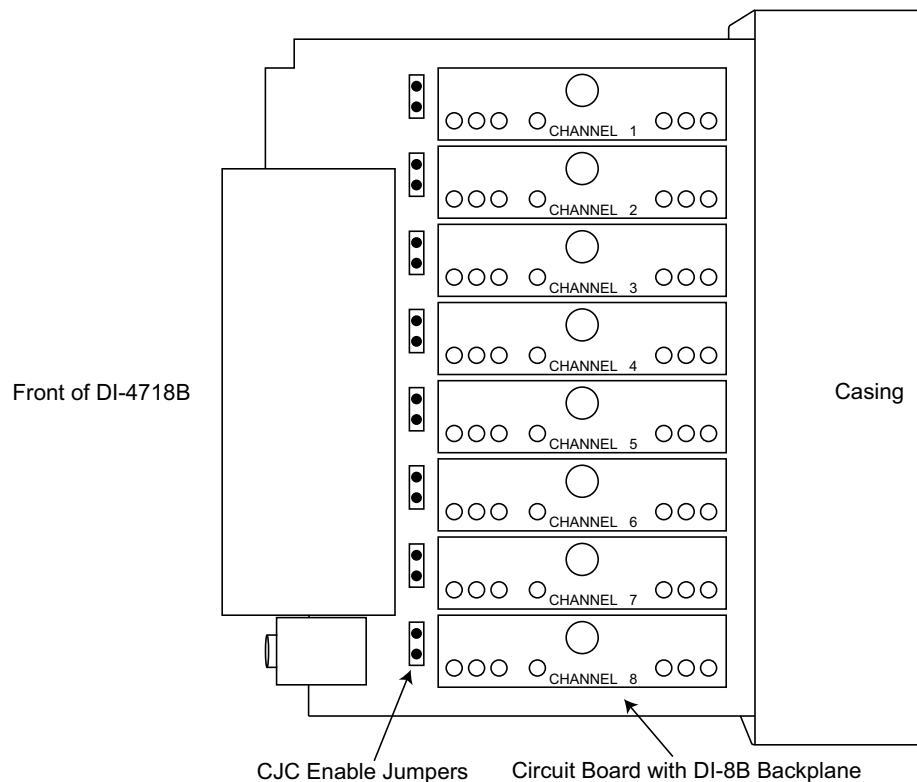
## Enabling CJC for Thermocouple Modules

Enable Cold Junction Compensation for each Thermocouple Input module installed. The CJC Enable Jumpers are located on the circuit board of the instrument. **Note:** *If you are not using a Thermocouple Input Module on that channel be sure the jumper is disabled (removed or installed on only one pin) because this will affect the input signal.* Each channel has its own CJC enable jumper located in front of each channel position on the instrument circuit board.

1. Unplug the device and make sure there is no power to the instrument.
2. Remove the front panel and bezel by removing the two screws on the front of the instrument.
3. Remove the ground lug from the back of the instrument.
4. Pull the circuit board apart from the casing to reveal the CJC Enable Jumpers.
5. Install a jumper onto the board for each channel that uses a thermocouple module. Eight jumpers are provided with the DI-4718B for this purpose.

**Note:** *If you are not using a Thermocouple Input Module on that channel be sure the jumper is disabled (removed or installed on only one pin) because this will affect the input signal.*

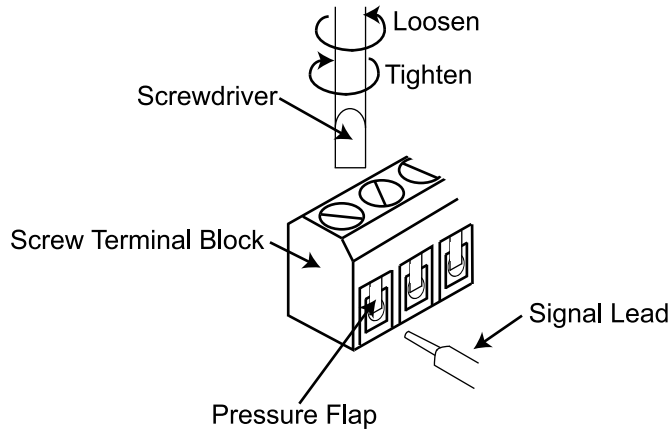
6. After the DI-8B modules and jumpers are installed reassemble the instrument making sure not to overtighten the two front screws.



## Connecting Signals

Use the removable screw terminal blocks located on the front of the instrument to connect your analog input signals. Refer to the Screw Terminal Access sticker on the top of the instrument for pinout.

1. Insert the stripped end of a signal lead into the desired terminal directly under the screw.
2. Tighten the pressure flap by rotating the screw clockwise with a small screwdriver. Make sure that the pressure flap tightens only against the signal wire and not the wire insulation. **Do not over-tighten.**
3. Tug gently on the signal lead to ensure that it is firmly secured.

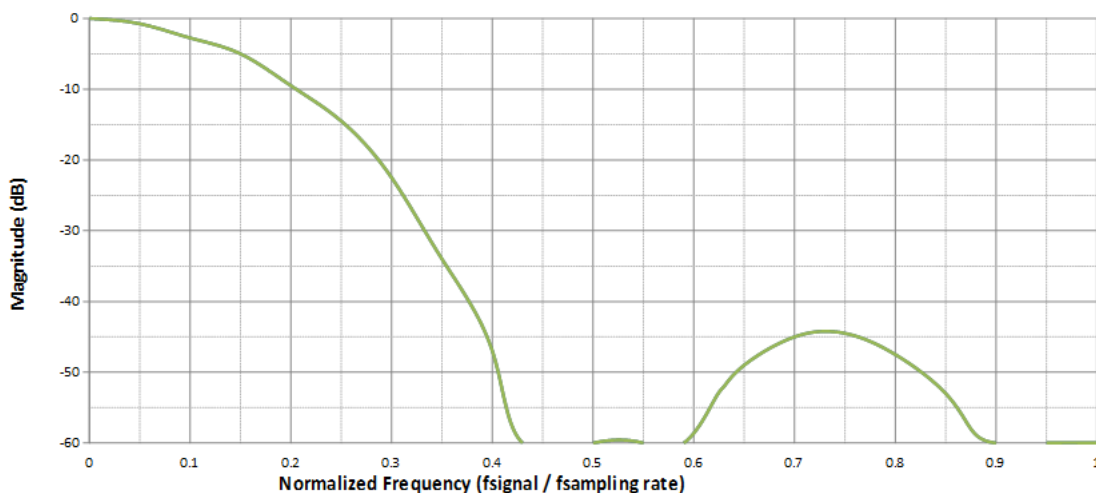


When an input signal is connected and WINDAQ Acquisition software is run, WINDAQ's real time display immediately reveals the input waveform on your computer's monitor.

### Low-pass Filter

Each analog channel employs a low-pass filter with automatic corner frequency selection. The filter is a CIC (cascaded integrator comb) type that uses as many as 512 samples per channel to calculate in real time as data is acquired. Filter response is optimized when sampling frequency is set to ten times the highest frequency of interest.

Typical Low-pass Filter Frequency Response



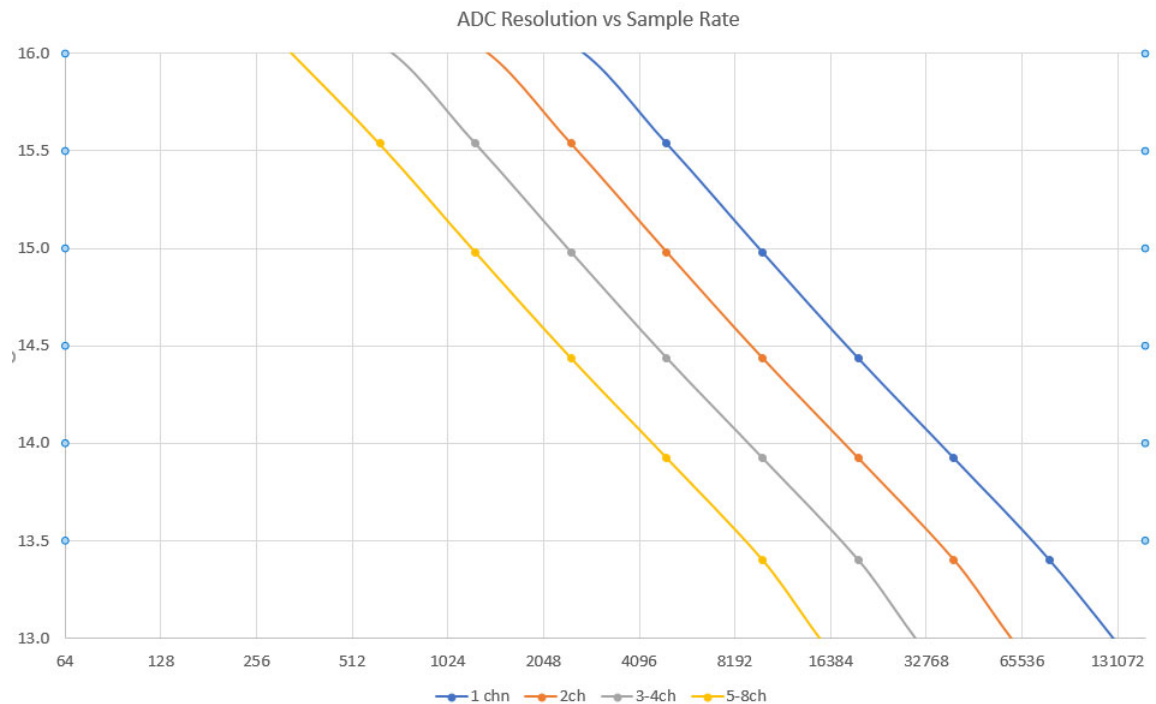
The DI-4718B calculates its own Last Point, Maximum, Minimum, and Filter data making it available at the programming level. Acquisition methods “RMS” and “Frequency” are permanently disabled for the DI-4718B as are Input Types “Nonlinear” and “Thermocouple” and selections for “Unipolar” and “Fahrenheit.”

### **Resolution as a Function of Sample Rate**

The resolution of the DI-4718B is a function of sample rate. The lower the sample rate the higher the resolution. ADC resolution (R) is a function of selected sample rate per channel (F), and the number of enabled analog channels (C):

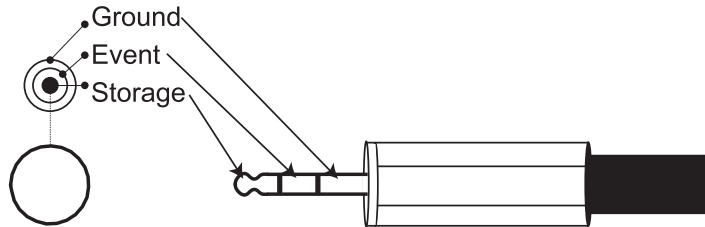
$$R = \frac{\log\left(\frac{160000}{FC}\right)}{\log(4)} + 12$$

C	Enabled Channels
1	1
2	2
4	3-4
8	5-8

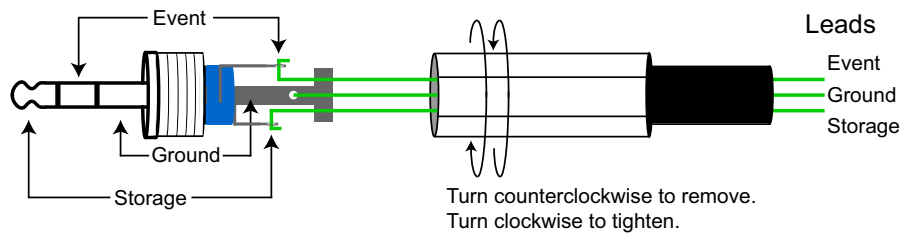


### Built-In Remote Control Jack

The built-in remote control jack located on the front panel of the DI-4718B accepts a standard 3.5mm stereo phone plug (provided) and provides access to remote events and stop/start remote recording control features in WinDaq. Refer to the diagram on the front panel for quick reference.



Use a switch closure or TTL signal to record WINDAQ Event Markers (WinDaq Remote Events) or to begin recording data remotely (WinDaq Remote Storage) using WinDaq. Connect signal leads inside the plug using the following diagram.



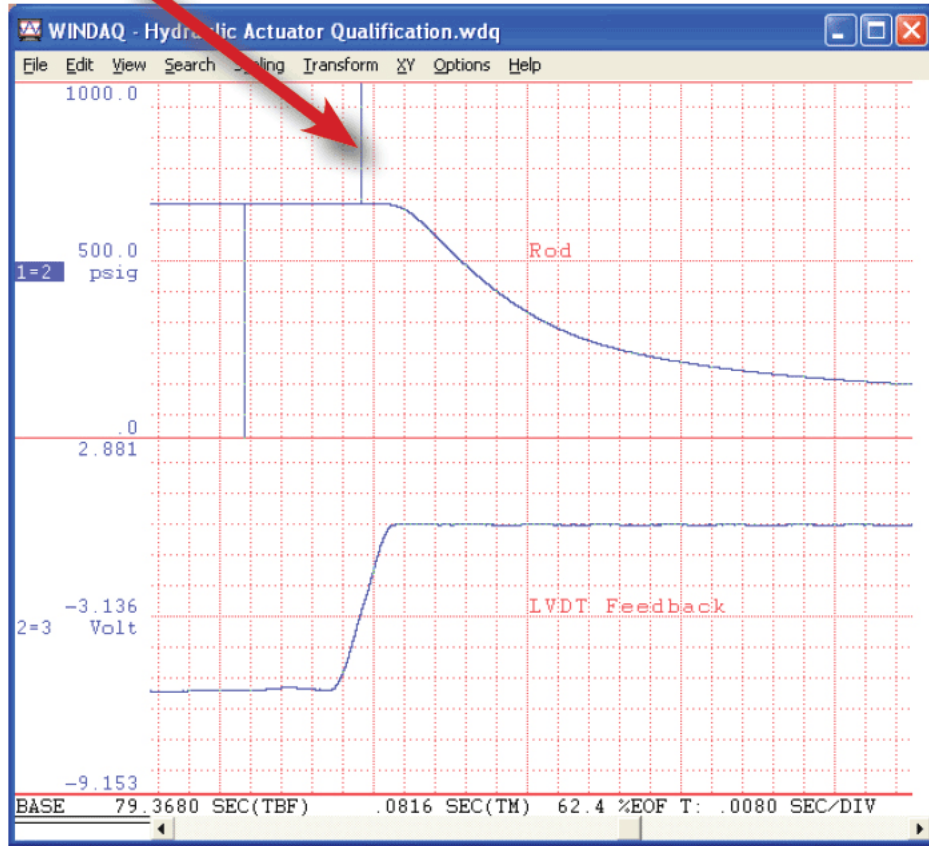
### WINDAQ Remote Events

Once the switch closure or TTL signal is connected, activate Remote Events through WINDAQ Acquisition Software. Events may be automatically placed on the rising or falling edge of the trigger signal. Use the menu command **Options > Remote Events +** to set WINDAQ to place event markers on low-to-high transitions of the Event input. Use the menu command **Options > Remote Events -** to set WINDAQ to place event markers on high-to-low transitions of the Event input.

Event markers may also be placed in your data file manually by pressing the push button on the back panel of the instrument while in Recording mode. You must enable Remote Events in WINDAQ to use the button (use the menu command **Options > Remote Events +** or **Options > Remote Events -**).

An example event marker in a WINDAQ data file is shown below.

### Event Marker\*



*\*Please Note: Event Markers do not display in the real-time WINDAQ acquisition software - they only display in the WINDAQ playback software (WWB).*

### WINDAQ Remote Storage

Once the switch closure or TTL signal is connected, activate Remote Storage (Record) through WINDAQ Acquisition Software. Storage to Disk may be automatically placed on the rising or falling edge of the trigger signal. Use the menu command **Options > Remote Storage 1** to set WINDAQ to begin recording on low-to-high transitions of the Record input. Use the menu command **Options > Remote Storage 0** to set WINDAQ to begin recording on high-to-low transitions of the Record input.

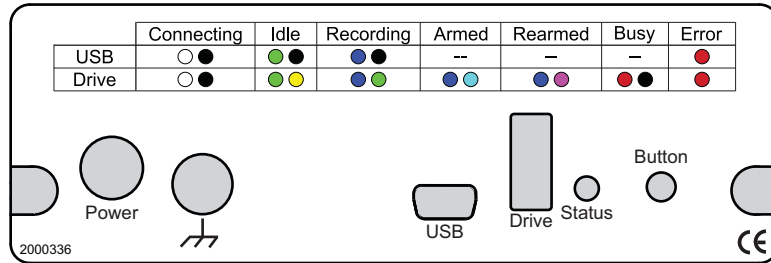
### General-purpose Digital Inputs

The radio jack can also be used as two general-purpose digital inputs. Channel 9 is the designated Digital Input channel. CH9 records and displays all the digital inputs. In WinDaq software, with Channel 9 selected in the display window, click **Scaling > Digital Plot** to show a digital display and make the data more meaningful on screen.

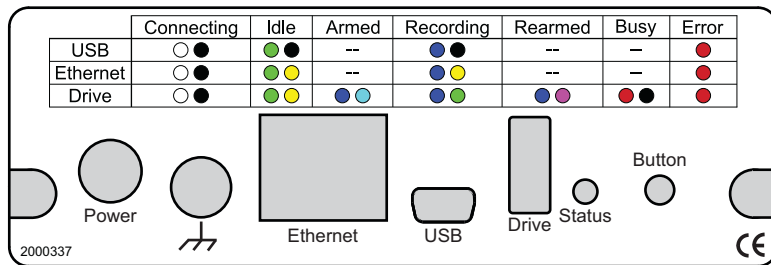
## Instrument Rear Panel

The rear panel of DI-4718B instruments provide access to power and interface connections, ground, status LED, and USB drive port. The rear panel can vary depending on your model.

### USB Models



### Ethernet Models



#### Power Input Jack

Power must be applied with the included power adapter or with an alternate appropriate source (9-36VDC, 15 watts max). Power over Ethernet (PoE) instruments derive power through the Ethernet port.

#### Ground Lug

This ground lug should always be connected to a solid chassis or earth ground. This connection is mandatory for the unit to meet CE guidelines.

#### Ethernet Port

The Interface port allows you to connect the instrument to your PC via Ethernet cable. When in Ethernet mode the USB connection is inactive.

#### Mini-B USB Port

The Interface port allows you to connect the instrument to your PC via USB cable. When in USB mode the Ethernet cable and USB thumb drive are inactive.

#### USB Drive Port

Allows you to record to any USB flash memory device. Not all flash memory is fast enough to record at higher sample rates. Use the provided USB flash drive for rates below 20,000 S/s Throughput. The mini-USB interface cannot be used in conjunction with the USB Drive.

#### Status LED

Indicates what mode the instrument is currently in. Use the chart on the rear panel of the instrument for quick reference. See “Mode LED Indicator” on page 18 for a list of modes.

## Control Button

The Control Button can be used to stop or start recording data to your memory card (SD) when using the instrument as a stand-alone data logger. The Control Button can also be used to reconfigure the instrument to factory default settings and to re-format memory card files left open due to power failure or other circumstance. The Control Button is inoperable while running WINDAQ Acquisition software. See “Control Button Operations” on page 17 for operations.

## Control Button Operations

The Control Button can be used to stop or start recording data to the USB thumb drive when using the instrument as a stand-alone data logger. The Control Button can also be used to reconfigure the instrument to factory default settings. The Control Button can also be used to create an instantaneous event marker when running WINDAQ Acquisition software.

## Record Data to USB Thumb Drive

Record data to an installed USB thumb drive. The device must be in Idle mode and set for USB Drive (mode LED must be flashing Green/Yellow). After the button is pressed, the mode LED will flash Blue/Green or Blue/Cyan to indicate it is in a recording mode.

## Stop Recording to USB Thumb Drive

Manually stop recording to the USB thumb drive (when the mode LED is flashing Blue/Green, Blue/Cyan, or Blue/Magenta). After the button is pressed the mode LED will flash Green/Yellow to indicate Idle.

## Fix Errors

The Control Button can also be used to fix some common operating errors. When the instrument is in Error mode (mode LED is solid red), some action must be taken to fix the error before you can use it. Generally, the Control Button can be used to make the instrument operational again when in Error mode.

## Switching between LibUSB and CDC Modes

The native communication mode of the DI-4718B is LibUSB but it can be switched to the USB CDC (Communication Device Class). CDC mode allows the USB port of DI-4718B devices to appear like a traditional RS-232 port, which is common across most operating systems and development languages. **Please note:** *LibUSB communication is required for WinDaq Acquisition software and programming with our .NET SDK. Only switch to CDC mode when writing your own programs at the protocol level (for example, Python applications).* Use the following sequence to switch your device to/from LibUSB/CDC modes:

1. Connect the device to your PC via the USB port.
2. Apply power to the device.
3. When mode LED stops blinking white and is in Idle mode, push and hold the Control button. This must be completed within five seconds after the device is in Idle mode.
4. When the mode LED turns red, release the Control button.
5. The Mode LED will flash white then indicate Idle in either LibUSB or CDC mode:
  - CDC mode: Blinking Yellow
  - LibUSB mode: Blinking Green

## Save Ethernet and Stand-alone configuration to Thumb Drive

Save Ethernet settings and/or stand-alone configuration settings using the Control Button. Ethernet and Stand-alone configurations can also be saved to the thumb drive via the Dashboard (preferred method). See “WinDaq Dashboard” on page 20. Device must be in Idle mode for Ethernet or USB thumb Drive (mode LED blinks green/yellow). The Unlock Code must be purchased for your device in order to save the stand-alone configuration.

1. Format your USB thumb drive using your PC.
2. Confirm device is in Idle mode for USB Flash Drive (mode LED blinks Green/Yellow).
3. Push and hold the Control button.
4. Plug the formatted (empty) thumb drive into the device (Drive) while holding the button in.
5. Release the button when the mode LED changes to Red/Black.
6. The device will read and load the configuration files to the thumb drive and revert to Idle mode when complete.

Configuration files include network.json and config.whd or config.whc. Use the WinDaq Dashboard to create configuration files.

### Apply Ethernet and Stand-alone Configuration to Device



Load Ethernet settings or stand-alone configuration settings using the Control Button. Ethernet and Stand-alone configurations can also be applied via the Dashboard (preferred method). See “WinDaq Dashboard” on page 20. Device must be in Idle mode for Ethernet or USB thumb Drive (mode LED blinks green/yellow). The Unlock Code must be purchased for your device in order to apply the stand-alone configuration.

1. Save configuration files to your USB thumb drive.
2. Confirm device is in Idle mode for USB Flash Drive (mode LED blinks Green/Yellow).
3. Push and hold the Control button.
4. Plug the thumb drive into the device (Drive) while holding the button in.
5. Release the button when the mode LED changes to Red/Black.
6. The device will read and load the configuration files to the device and revert to Idle mode when complete.











Configuration files include network.json and config.whd or config.whc. Use the WinDaq Dashboard to create configuration files.

### Mode LED Indicator

Indicates what mode the instrument is currently in. Use the chart on the rear panel of the instrument for quick reference. Use the table provided below for a more detailed description of each available state as well as a description of some states not displayed on the label.

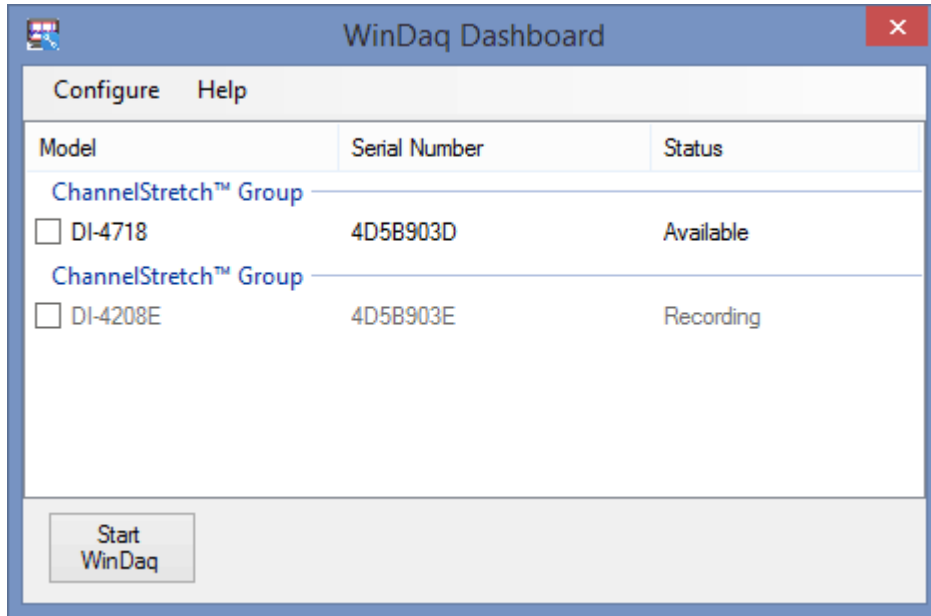
State	Mode	Description
 Blinking White	Connecting	The device is looking for a connection to your PC or USB thumb drive. It will check the USB interface first, then the Ethernet and USB thumb drive. Once a connection is established the device will enter Idle mode.
 Blinking Green	Idle USB Connected	The device is connected to and communicating with your PC through the USB port. The USB thumb drive and Ethernet port are not accessible.



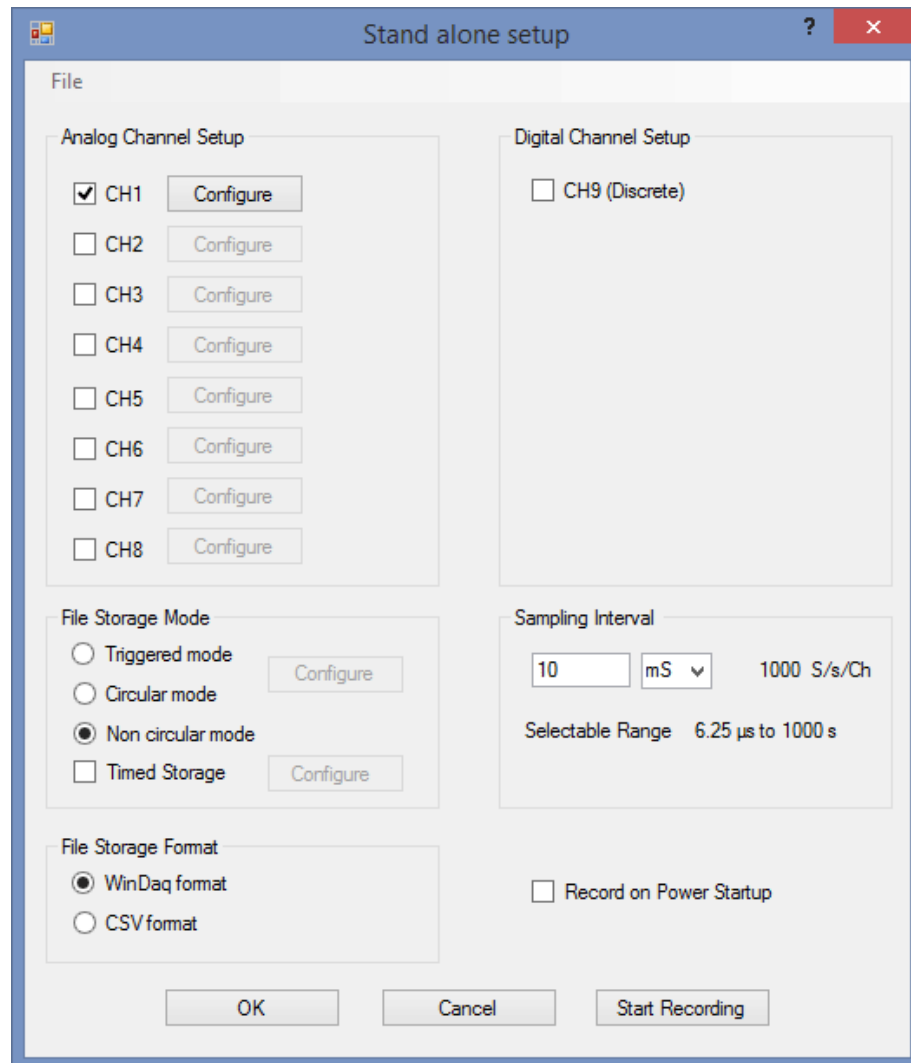
 Blinking Green/ Yellow	Idle Ethernet or USB Drive Connected	The device is connected to and communicating with your PC through the Ethernet port or the device is in Stand-alone mode. The USB interface is not accessible.
 Blinking Blue	Acquiring Data to PC via USB Interface	WinDaq Acquisition Software is running and the device is acquiring data to your PC via the USB interface.
 Blinking Blue/ Yellow	Acquiring Data to PC via Ethernet Interface	WinDaq Acquisition Software is running and the device is acquiring data to your PC via the Ethernet interface.
 Blinking Blue/ Green	Recording Data to USB thumb Drive	The device is acquiring data and recording to your USB thumb drive. Do not remove power - power interruption could result in data file corruption.
 Blinking Blue/ Cyan	Armed USB thumb Drive is waiting for a trig- ger condition	The device is acquiring data and waiting for a trigger condition to begin recording to your USB thumb drive. Do not remove power or the USB thumb drive - either could result in data file corruption.
 Blinking Blue/ Cyan	Re-armed USB thumb Drive is waiting for a trig- ger condition	The device is acquiring data and waiting for another trigger condition to continue recording to your USB thumb drive. Do not remove power or the USB thumb drive - either could result in data file corruption.
 Blinking Red	Busy USB thumb Drive is busy	The device is reading from or writing to the USB thumb drive. Do not remove power or the USB thumb drive - either could result in data file corruption.
 Solid Red	Error	The device is unable to perform any operations. Cycle power or use the control button to resolve the error.
 Solid White	Button Pushed	The LED turns white to indicate the control button is engaged.
 Blinking Yellow	Idle USB connected in CDC mode	The device is connected to and communicating with your PC through the USB port in CDC mode. WinDaq software will not run. The USB thumb drive and Ethernet port are not accessible.

## WinDaq Dashboard

The WinDaq Dashboard allows you to run WinDaq Data Acquisition software, sync the device clock with your PC, modify Ethernet settings, configure your instrument for stand-alone data logging to record data to a USB flash drive, and access the USB thumb drive via the Ethernet interface. Devices in a ChannelStretch™ Group can synchronize data recording in that group. Select all the devices under a ChannelStretch group and click on the Start WinDaq button. Stand-alone data logging is not available using ChannelStretch (See “ChannelStretch™” on page 21.).



Use the Configure menu to access the Stand alone setup window.



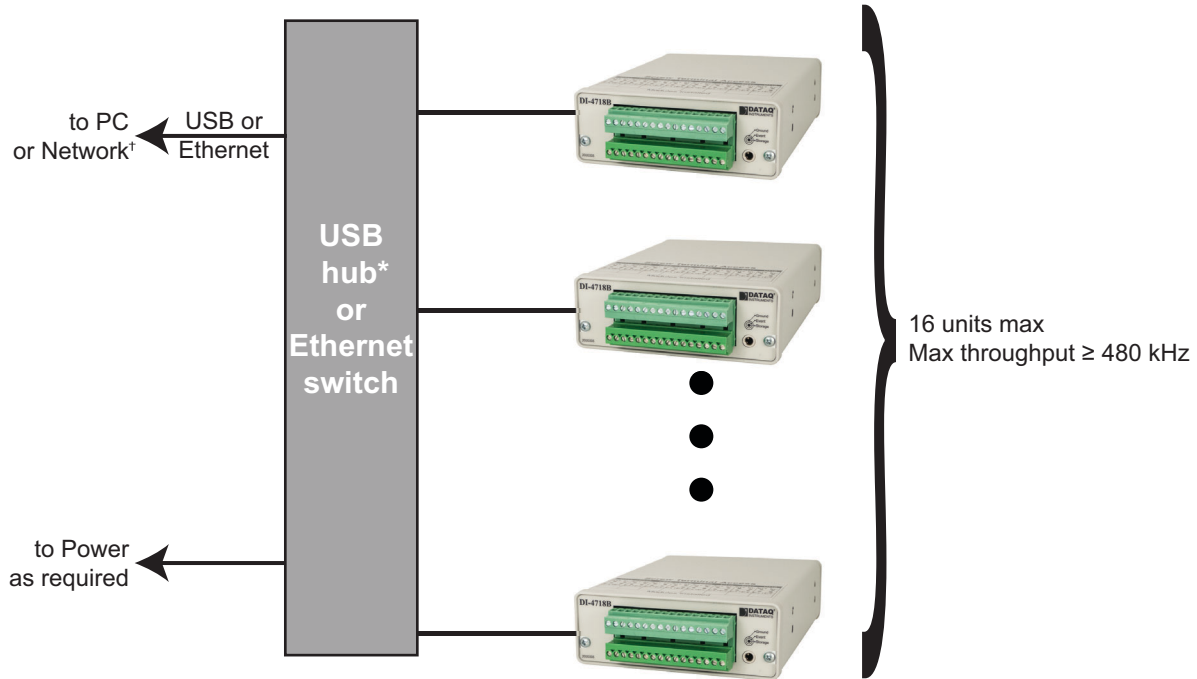
Select and configure all channels available on your device, select a sampling interval, and setup recording Trigger conditions. The Stand alone configuration also allows you to Save/Load configurations via the File menu. Use the help file provided in WinDaq Dashboard to learn more.

## ChannelStretch™

Expand the channel count of your DI-4718B with ChannelStretch. Both the DI-4718B-U and the DI-4718B-E can synchronize with other USB devices via the USB interface. The DI-4718B-E can also synchronize with other Ethernet instruments via the Ethernet interface. Connect up to 16 DI-4718B, DI-1120, DI-4108, and/or DI-4208 devices with a powered USB hub (or multiple cascaded/connected powered USB hubs) or Ethernet switch to record more than 8 channels of data to a single WinDaq file. This provides a total of up to 128 analog channels and 112 digital ports at a maximum throughput rate of 480 kHz. Cascade multiple USB hubs or Ethernet switches to expand port count. Synchronized instruments must have the same sample rate per channel, regardless of channel number, type, or range. The WinDaq/Unlock option **per instrument** is required to synchronize two or more devices when using WinDaq software.

### Connection

All USB devices must be on the same USB controller (or hub)\* in order to synchronize data acquisition. All Ethernet devices must be on the same subnet as the PC that is recording the data.



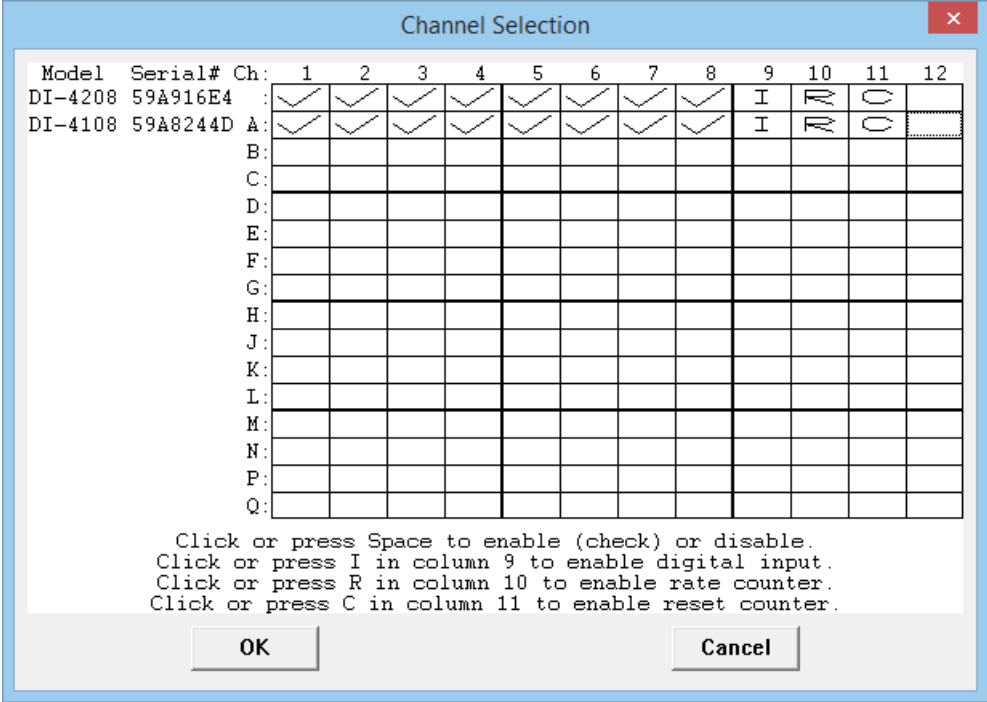
\*DATAQ Instruments 7-port USB hub (part number 2000310). Cascade for a higher port count.

†PC must reside in the same subnet.

**\*Please Note:** Because of the way Windows operating systems manage USB controllers, the only way to be absolutely sure you are on the same controller is to use a powered USB hub.

**Channel Selection**

Devices are listed in the Channel Selection grid in alpha-numeric order of the serial numbers of the device. All devices must be connected before starting WinDaq.





# 5. Unlock SA-Enabled

An unlock code is required to record more than a single channel to the USB flash drive or to use ChannelStretch™ to synchronize multiple instruments (unlock code required for each unit to be synchronized). Go to <https://www.dataq.com/products/di-4718b/di-4718b-u.html> or <https://www.dataq.com/products/di-4718b/di-4718b-e.html> to purchase the unlock code (under Accessories) or call 330-668-1444. Once purchased, you will be given a Key code to enter into the WinDaq Dashboard utility.

1. Start WinDaq Dashboard software.
2. Select your device and click the menu item **Configure > Stand Alone Setup**.



3. Click on the **Yes** button to enter your code. Click on the **No** button to go to Stand-alone configuration for a single channel.



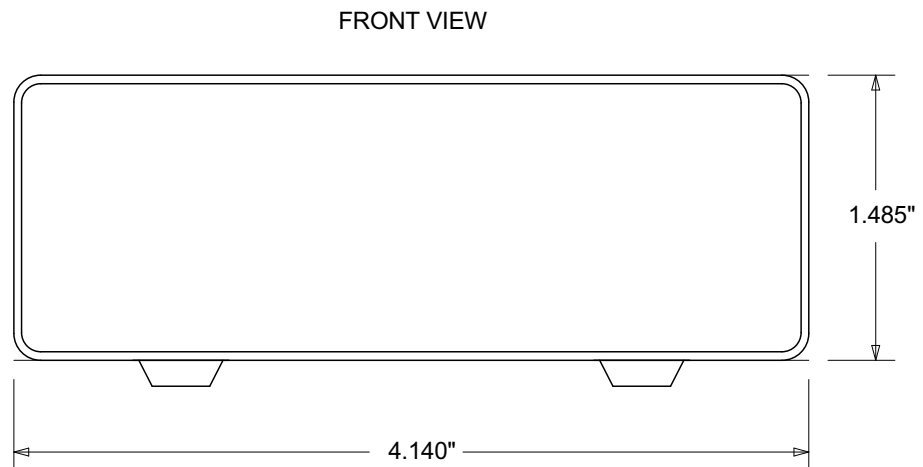
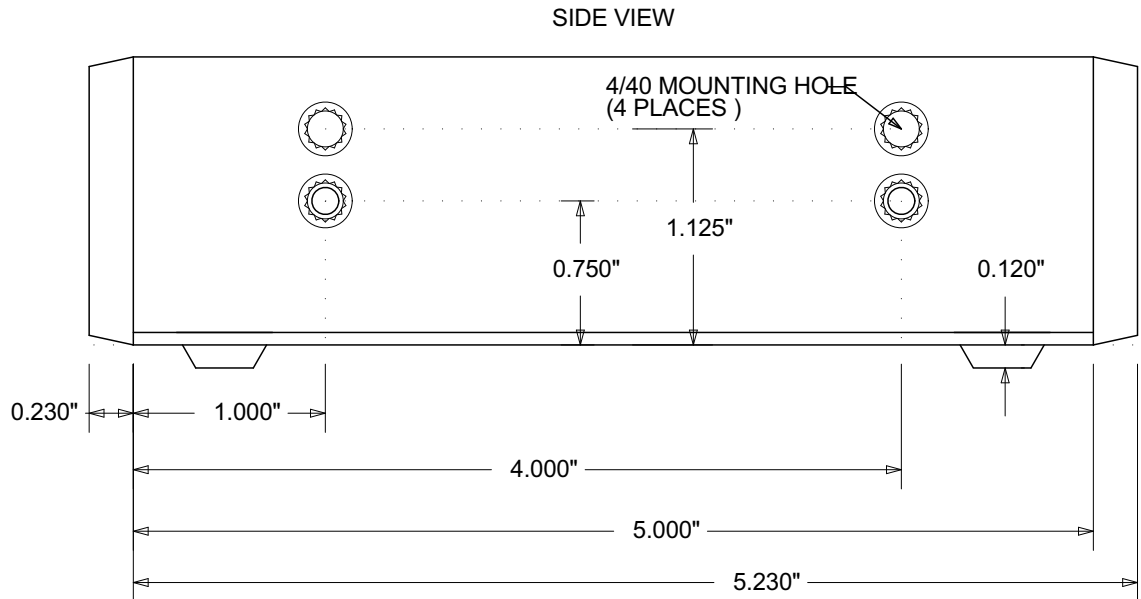
4. Enter the Key in the appropriate dialog boxes
5. Click **OK**.

Your device is now unlocked for ChannelStretch and stand-alone data logging.





# 6. Dimensional Drawing





# 7. DI-8B Modules

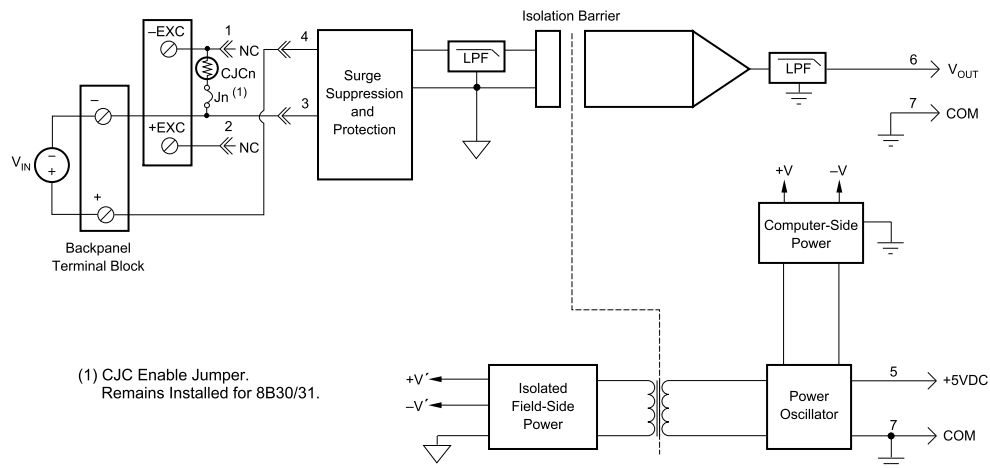
## DI-8B30/31 Analog Voltage Input Modules, 3Hz Bandwidth

Each DI-8B30 or DI-8B31 module isolates, filters and amplifies a voltage input signal and provides an analog voltage output.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B30 and DI-8B31 modules provides protection against accidental connection of power-line voltages up to 240VAC.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B30-01	-10mV to +10mV	-5V to +5V
DI-8B30-02	-50mV to +50mV	-5V to +5V
DI-8B30-03	-100mV to +100mV	-5V to +5V
DI-8B31-01	-1V to +1V	-5V to +5V
DI-8B31-02	-5V to +5V	-5V to +5V
DI-8B31-03	-10V to +10V	-5V to +5V
DI-8B31-07	-20V to +20V	-5V to +5V
DI-8B31-09	-40V to +40V	-5V to +5V
DI-8B31-12	-60V to +60V	-5V to +5V

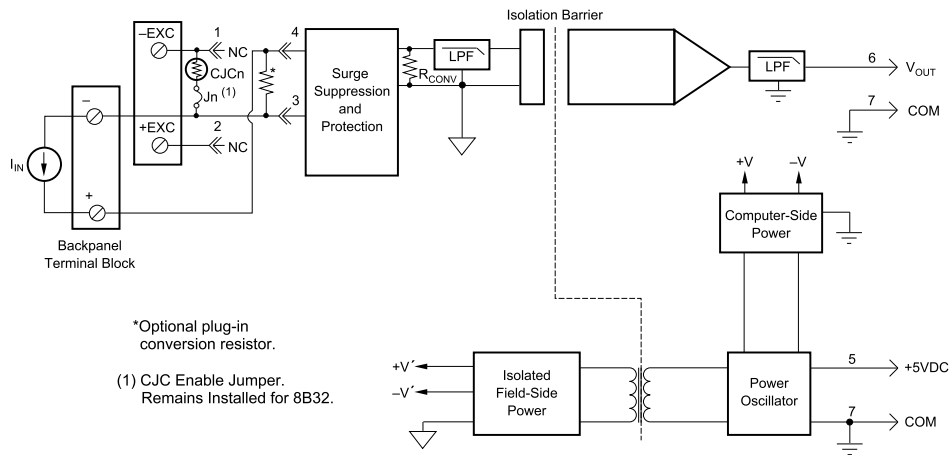
## DI-8B32 Analog Current Input Modules

Each DI-8B32 module isolates, filters and amplifies a process current input signal and provides an analog voltage output.

Current to voltage conversion is accomplished internal to the module to ensure high accuracy.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the 8B32 module provides protection against accidental connection of power-line voltages up to 30VAC. Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



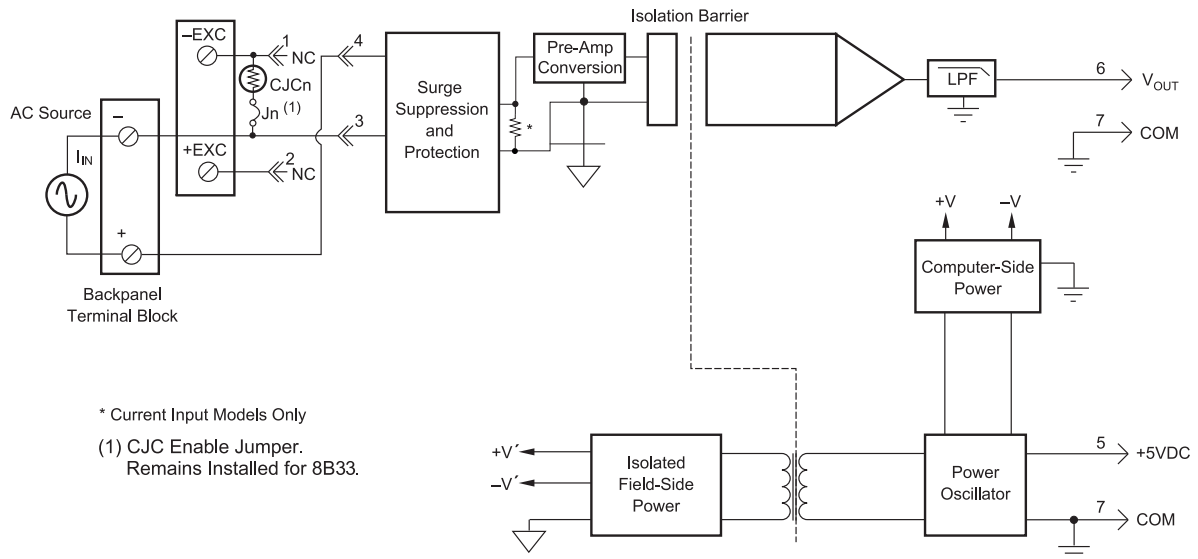
<b>Ordering Information</b>		
MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B32-01	4mA to 20mA	0V to +5V
DI-8B32-02	0mA to 20mA	0V to +5V

## DI-8B33 True RMS Input Modules

Each DI-8B33 True RMS input module provides a single channel of AC input which is converted to its true RMS DC value, filtered, isolated, amplified, and converted to a standard process voltage or current output.

The field voltage or current input signal is processed through a pre-amplifier and RMS converter on the field side of the isolation barrier. The converted DC signal is then chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common mode spikes and surges. The computer side circuitry reconstructs, filters, and converts the signal to an industry standard output of 0 to 5 VDC.

Special input circuits provide protection against accidental connection of power line voltages up to 300VAC and against transient events defined by ANSI/IEEE C37.90.1



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B33-01	0mV to 100mV	0V to +5V
DI-8B33-02	0V to 1V	0V to +5V
DI-8B33-03	0V to 10V	0V to +5V
DI-8B33-04	0V to 150V	0V to +5V
DI-8B33-05	0V to 300V	0V to +5V

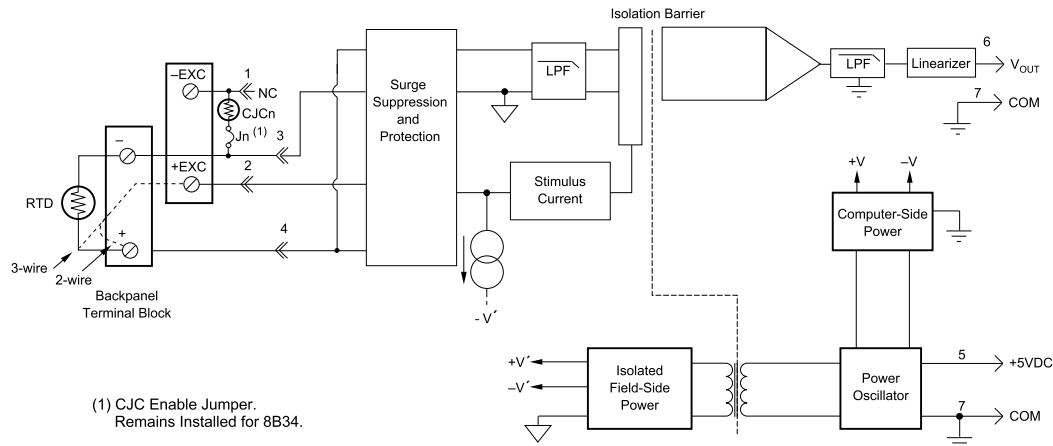
## DI-8B34 Linearized 2- or 3-Wire RTD Input Modules

Each DI-8B34 module isolates, filters, amplifies, and linearizes a single channel of temperature input from an RTD and provides an analog voltage output.

RTD excitation is provided from the module using two matched current sources. When using a 3-wire connection, this method allows equal currents to flow through the sensor leads, cancelling the effects of lead resistances. The excitation currents are small (0.25mA) which minimizes the self-heating of the RTD.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B34 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE	ACCURACY*
DI-8B34-01	-100°C to +100°C (-148°F to +212°F)	0V to +5V	±0.20°C
DI-8B34-02	0°C to +100°C (+32°F to +212°F)	0V to +5V	±0.15°C
DI-8B34-03	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20°C
DI-8B34-04	0°C to +600°C (+32°F to +1112°F)	0V to +5V	±0.45°C

\* Includes conformity, hysteresis and repeatability.

## DI-8B35 Linearized 4-Wire RTD Input Modules

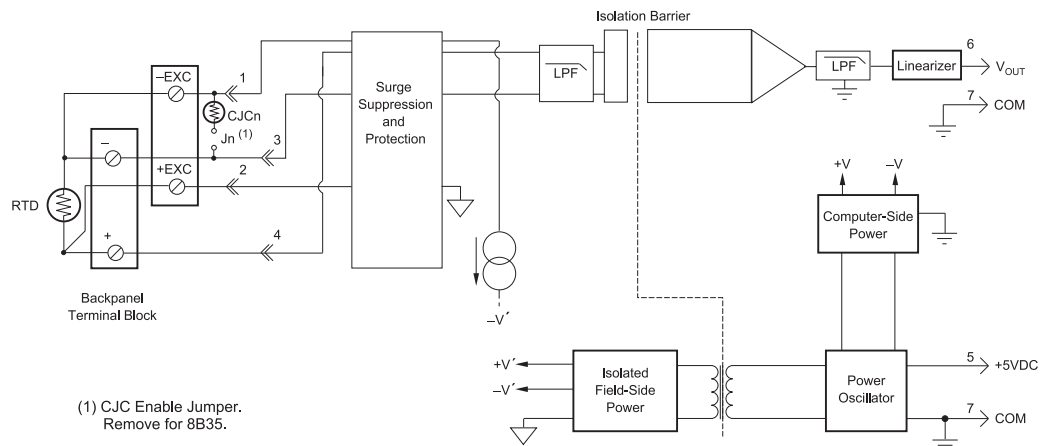
In RTD temperature measurement applications requiring a very high level of accuracy, the DI-8B35 4-Wire RTD input module offers a significant advantage over 3-wire measurement techniques (see block diagram). The DI-8B35 measures only the voltage dropped across the RTD and almost completely ignores the resistance or length of the RTD lead wires. The DI-8B34 3-Wire RTD module provides lead resistance compensation, but requires equal lead resistances, while the DI-8B35 does not require matched lead resistances.

Each DI-8B35 module isolates, filters, amplifies, and linearizes a single channel of temperature input from an RTD and provides an analog voltage output.

RTD excitation is provided from the module using a precision current source. Excitation current does not flow in the input signal leads, which allows RTD measurements to be made independent of lead resistance. The excitation currents are small (0.25mA) which minimizes self-heating of the RTD.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B35 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE	ACCURACY*
DI-8B35-01	-100°C to +100°C (-148°F to +212°F)	0V to +5V	±0.20°C
DI-8B35-02	0°C to +100°C (+32°F to +212°F)	0V to +5V	±0.15°C
DI-8B35-03	0°C to +200°C (+32°F to +392°F)	0V to +5V	±0.20°C
DI-8B35-04	0°C to +600°C (+32°F to +1112°F)	0V to +5V	±0.45°C

\* Includes conformity, hysteresis and repeatability.

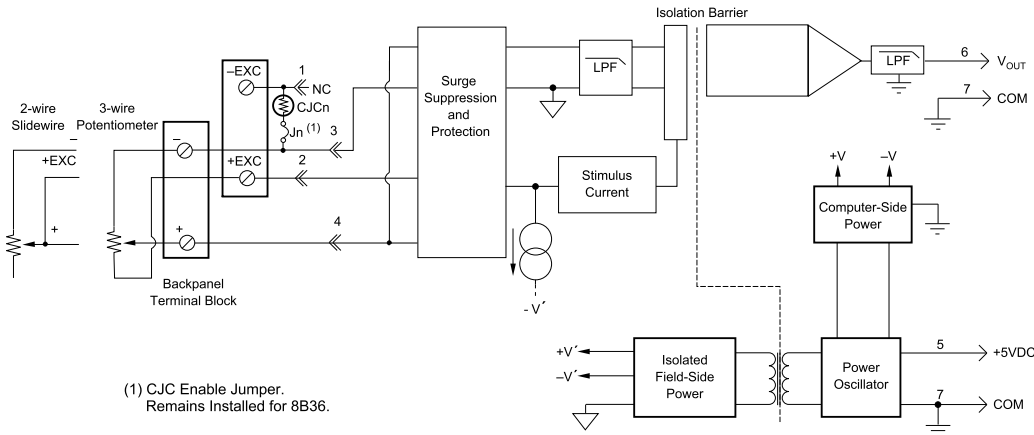
## DI-8B36 Potentiometer Input Modules

Each DI-8B36 module isolates, filters and amplifies a single channel of potentiometer input and provides an analog voltage output.

Excitation for the potentiometer is provided by using two matched current sources. When using a 3-wire connection, this method allows equal currents to flow through the sensor leads, cancelling the effects of lead resistances. The excitation currents are small (0.25mA) which minimizes the self-heating of the potentiometer.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B36 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B36-01	0 to 100 $\Omega$	0V to +5V
DI-8B36-02	0 to 500 $\Omega$	0V to +5V
DI-8B36-03	0 to 1k $\Omega$	0V to +5V
DI-8B36-04	0 to 10k $\Omega$	0V to +5V



## DI-8B38 Strain Gage Input Modules, Narrow & Wide Bandwidth

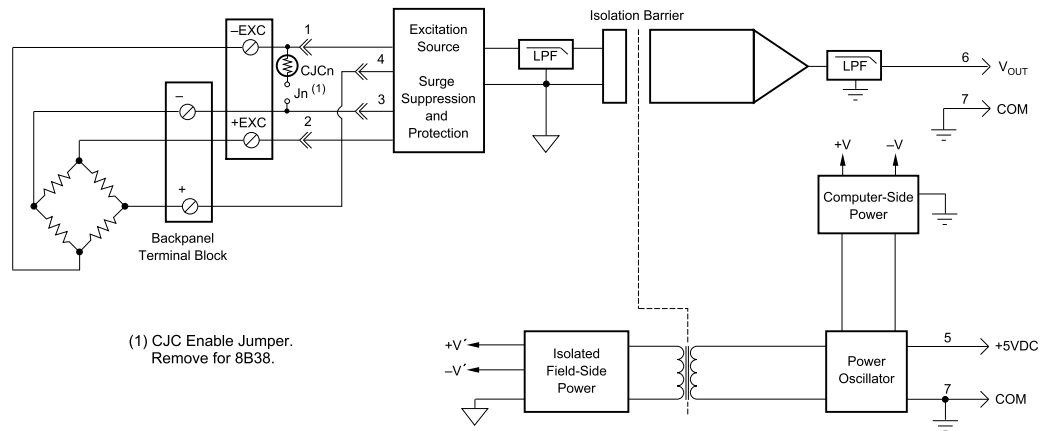
Each DI-8B38 module isolates, filters and amplifies a full-bridge strain gage input signal and provides an analog voltage output.

The 8B38 can interface to transducers with a nominal resistance of 100 to 2k. Bridge excitation is provided from the module with a stable 10.00V or 3.33V source. Full scale sensitivities of 2mV/V and 3mV/V are offered as standard.

Signal filtering is accomplished with a five-pole filter optimized for time and frequency response which provides 100dB per decade of normal-mode rejection above the filter cutoff frequency. One pole of this filter is on the field side of the isolation barrier, and the other four are on the system side.

A special input circuit on the the DI-8B38 module provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	BANDWIDTH	INPUT RANGE	EXCITATION	OUTPUT RANGE
DI-8B38-01	3kHz	-10mV to +10mV	3.333V at 3mV/V Sensitivity	-5V to +5V
DI-8B38-02	3kHz	-30mV to +30mV	10.0V at 3mV/V Sensitivity	-5V to +5V
DI-8B38-05	3kHz	-20mV to +20mV	10.0V at 2mV/V Sensitivity	-5V to +5V
DI-8B38-31	3Hz	-10mV to +10mV	3.333V at 3mV/V Sensitivity	-5V to +5V
DI-8B38-32	3Hz	-30mV to +30mV	10.0V at 2mV/V Sensitivity	-5V to +5V
DI-8B38-35	3Hz	-20mV to +20mV	10.0V at 2mV/V Sensitivity	-5V to +5V

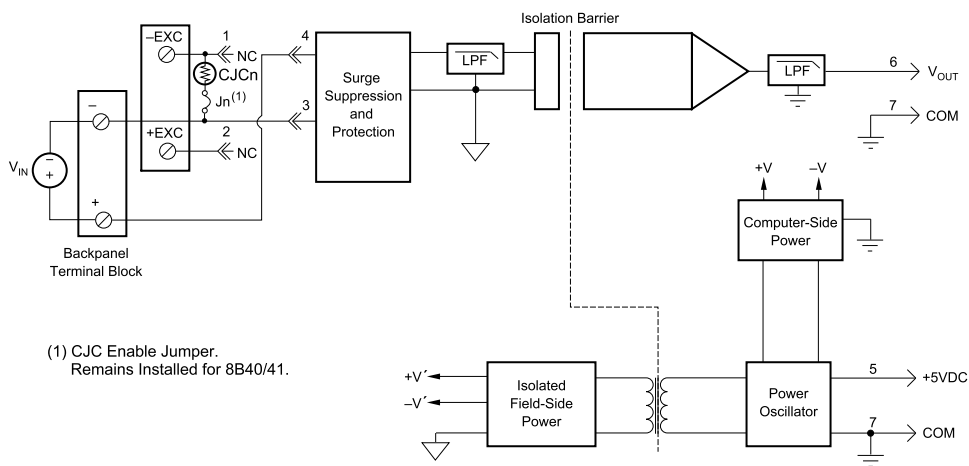
## DI-8B40/41 Analog Voltage Input Modules, 1kHz Bandwidth

Each DI-8B40 and DI-8B41 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output.

Signal filtering is accomplished with a multiple pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the remaining poles are on the system side.

A special input circuit on the DI-8B40 and DI-8B41 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp Circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B40-01	-10mV to +10mV	-5V to +5V
DI-8B40-02	-50mV to +50mV	-5V to +5V
DI-8B40-03	-100mV to +100mV	-5V to +5V
DI-8B41-01	-1V to +1V	-5V to +5V
DI-8B41-02	-5V to +5V	-5V to +5V
DI-8B41-03	-10V to +10V	-5V to +5V
DI-8B41-07	-20V to +20V	-5V to +5V
DI-8B41-09	-40V to +40V	-5V to +5V
DI-8B41-12	-60V to +60V	-5V to +5V

## DI-8B42 2-Wire Transmitter Interface Modules

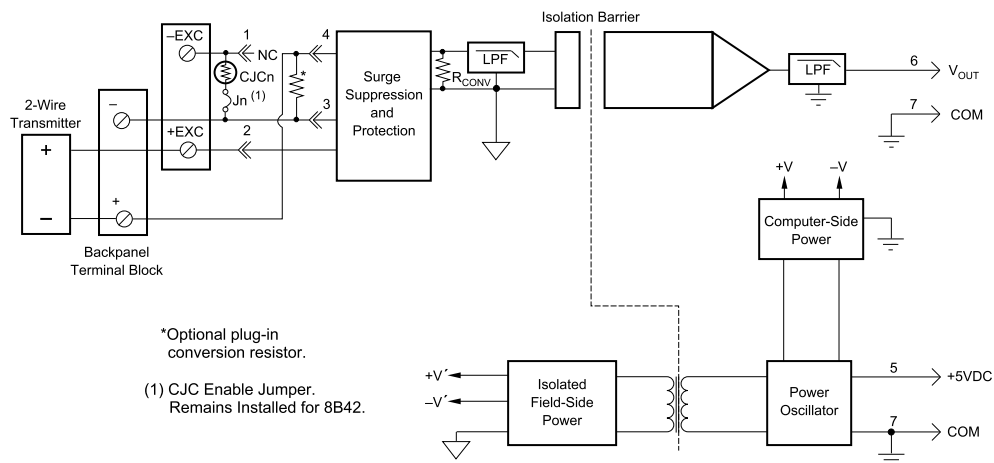
Each DI-8B42 module provides power to a current transmitter, then isolates, filters and amplifies the resulting process current input signal and provides an analog voltage output.

Current to voltage conversion is accomplished internal to the module to ensure high accuracy.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 60dB per decade of normal-mode rejection above 100Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B42 module provides protection against accidental connection of power-line voltages up to 40VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B42-01	4mA to 20mA	0V to +5V
DI-8B42-02	4mA to 20mA	+1V to +5V

## DI-8B43 DC LVDT Input Modules

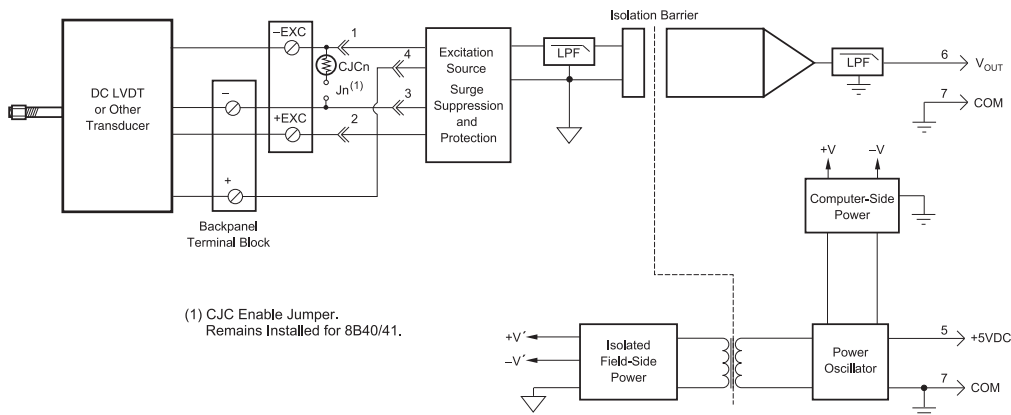
Each 8B43 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output.

The 8B43 can interface to transducers that will operate on a 10V excitation voltage and up to 20mA of excitation current.

Signal filtering is accomplished with a 5-pole filter optimized for time and frequency response which provides 100dBper decade of normal-mode rejection above 1kHz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other four are on the system side.

A special input circuit on the 8B43 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by transformer coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B43-01	-1V to +1V	-5 to +5V
DI-8B43-02	-2V to +2V	-5 to +5V
DI-8B43-03	-3V to +3V	-5 to +5V
DI-8B43-04	-4V to +4V	-5 to +5V
DI-8B43-05	-5V to +5V	-5 to +5V
DI-8B43-11	-1V to +1V	0 to +5V
DI-8B43-12	-2V to +2V	0 to +5V
DI-8B43-13	-3V to +3V	0 to +5V
DI-8B43-14	-4V to +4V	0 to +5V
DI-8B43-15	-5V to +5V	0 to +5V

## DI-8B45 Frequency Input Modules

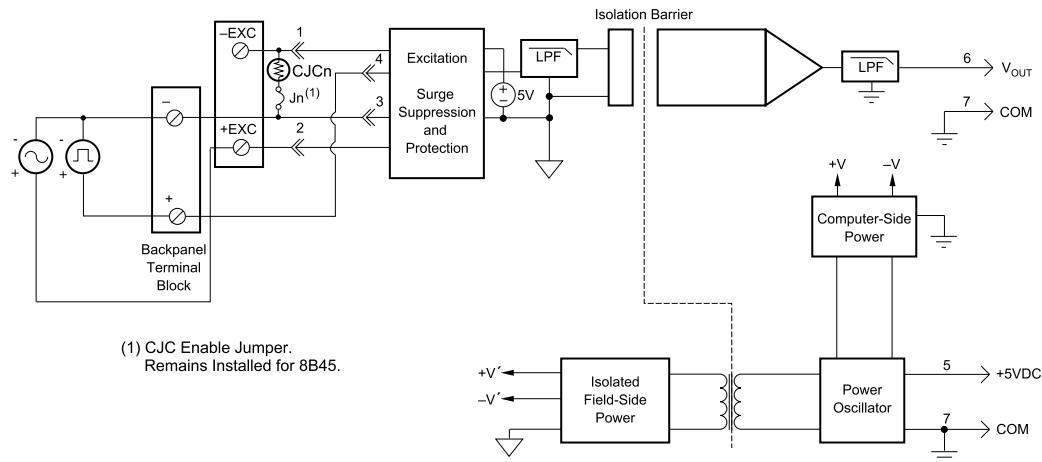
Each DI-8B45 module isolates and conditions a frequency input signal and provides an analog voltage output.

The frequency input signal can be either a TTL level or zero crossing with as little as  $\pm 100\text{mV}$  amplitude. Input circuitry for each signal type has built-in hysteresis to prevent spurious noise from corrupting the module output. TTL signals are applied to the + and - terminals while zero crossing signals are applied to the +EXC and - terminals. Reference the block diagram.

A 5V excitation is available for use with magnetic pick-up or contact closure type sensors. The excitation is available on the -EXC terminal with return on the - terminal.

A special input circuit on the DI-8B45 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE	EXCITATION
DI-8B45-01	0 to 500Hz	0 to +5V	+5V at 8mA max
DI-8B45-02	0 to 1kHz	0 to +5V	+5V at 8mA max
DI-8B45-03	0 to 2.5kHz	0 to +5V	+5V at 8mA max
DI-8B45-04	0 to 5kHz	0 to +5V	+5V at 8mA max
DI-8B45-05	0 to 10kHz	0 to +5V	+5V at 8mA max
DI-8B45-06	0 to 25kHz	0 to +5V	+5V at 8mA max
DI-8B45-07	0 to 50kHz	0 to +5V	+5V at 8mA max
DI-8B45-08	0 to 100kHz	0 to +5V	+5V at 8mA max

## DI-8B47 Linearized Thermocouple Input Modules

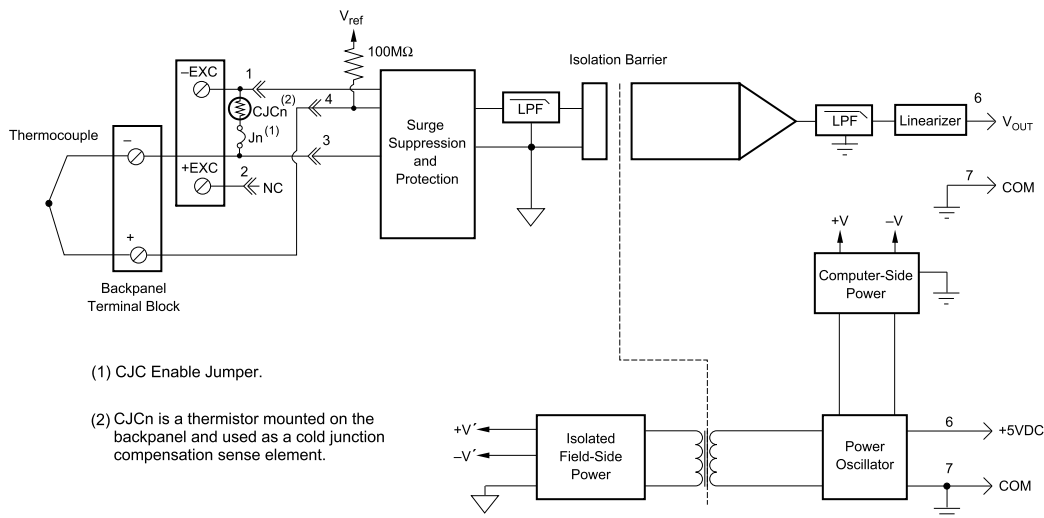
Each DI-8B47 module isolates, filters, amplifies, and linearizes a single channel of temperature input from a thermocouple and provides an analog voltage output.

Linearization is accomplished using a four breakpoint piece wise linear approximation.

The DI-8B47 can interface to industry standard thermocouple type J, K, and T and has an output signal of 0V to +5V. Each module is cold-junction compensated to correct for parasitic thermocouples formed by the thermocouple wire and screw terminals on the mounting backpanel. Upscale open thermocouple detect is provided by an internal pull-up resistor.

Signal filtering is accomplished with a three-pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the other two are on the system side.

A special input circuit on the DI-8B47 module provides protection against accidental connection of power-line voltages up to 240VAC.



### Ordering Information

MODEL	TYPE	INPUT RANGE	ACCURACY*
DI-8B47J-01	Type J	0°C to +760°C (+32°F to +1400°F)	±0.24% ±1.82°C
DI-8B47J-02	Type J	-100°C to +300°C (-148°F to +572°F)	±0.24% ±0.96°C
DI-8B47J-03	Type J	0°C to +500°C (+32°F to +932°F)	±0.21% ±1.05°C
DI-8B47J-12	Type J	-100°C to +760°C (-148°F to +1400°F)	±0.24% ±2.10°C
DI-8B47K-04	Type K	0°C to +1000°C (+32°F to +1832°F)	±0.24% ±2.40°C
DI-8B47K-05	Type K	0°C to +500°C (+32°F to +932°F)	±0.24% ±1.05°C
DI-8B47K-13	Type K	-100°C to +1350°C (-148°F to +2462°F)	±0.24% ±3.60°C
DI-8B47K-14	Type K	0°C to +1200°C (+32°F to +2192°F)	±0.24% ±2.88°C
DI-8B47T-06	Type T	-100°C to +400°C (-148°F to +752°F)	±0.48% ±2.40°C
DI-8B47T-07	Type T	0°C to +200°C (+32°F to +392°F)	±0.39% ±0.75°C

\*Includes conformity, hysteresis and repeatability. Does not include CJC accuracy.

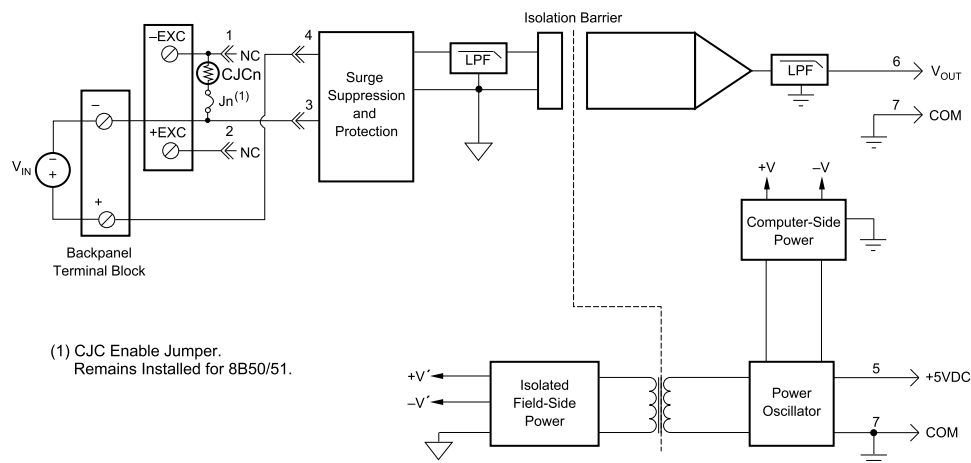
## DI-8B50/51 Analog Voltage Input Modules, 20kHz Bandwidth

Each DI-8B50 and DI-8B51 module isolates, filters, and amplifies a voltage input signal and provides an analog voltage output.

Signal filtering is accomplished with a multiple pole filter optimized for time and frequency response which provides 70dB of normal-mode-rejection at 60Hz. One pole of this filter is on the field side of the isolation barrier for anti-aliasing, and the remaining poles are on the system side.

A special input circuit on the DI-8B50 and DI-8B51 modules provides protection against accidental connection of power-line voltages up to 240VAC. Clamp circuits on the I/O and power terminals protect against harmful transients.

Isolation is provided by optical coupling to suppress transmission of common mode spikes or surges. The module is powered from +5VDC,  $\pm 5\%$ .



### Ordering Information

MODEL	INPUT RANGE	OUTPUT RANGE
DI-8B50-01	-10mV to +10mV	-5V to +5V
DI-8B50-02	-50mV to +50mV	-5V to +5V
DI-8B50-03	-100mV to +100mV	-5V to +5V
DI-8B51-01	-1V to +1V	-5V to +5V
DI-8B51-02	-5V to +5V	-5V to +5V
DI-8B51-03	-10V to +10V	-5V to +5V
DI-8B51-07	-20V to +20V	-5V to +5V
DI-8B51-09	-40V to +40V	-5V to +5V
DI-8B51-12	-60V to +60V	-5V to +5V

