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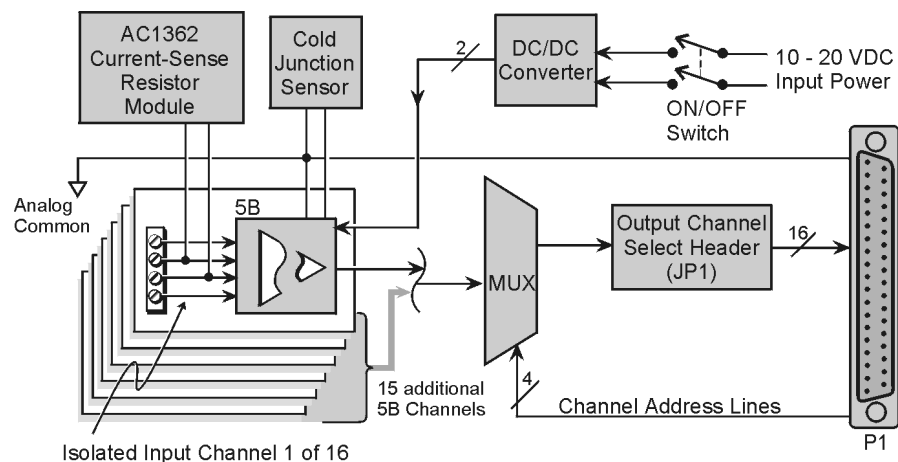
**Software Setup ..... 5****mx+b Values for 5B Modules ..... 6****DBK42 – Specifications ..... 7****Reference Notes:**

- Refer to [Chapter 2, Power Management](#), in regard to calculating system power requirements.
- [Chapter 3, System Connections and Pinouts](#), includes pinouts for P1, P2, P3, and P4. Refer to the pinouts that are applicable to your system, as needed.

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**Overview**

The DBK42 allows LogBook or Daq device systems to work with up to 16 5B signal conditioning modules. Modules are available for various signal types (e.g., low-level thermocouple signals, strain-gage signals, etc). The DBK42 offers 500 V isolation from the system and between channels. The DBK42 is compatible with all 5B output modules, and the configuration is very flexible. You can select the type of signal attached to each channel.



An accessory cable connects the DBK42's output to the P1 analog input connector. One LogBook or Daq device can support up to 16 DBK42 units with a maximum of 256 isolated analog input channels. The LogBook or Daq device scans the DBK42 channels at the same 10  $\mu$ s/channel rate as other DBKs (256 scans in 2.56 ms in a full system).

The DBK42 can obtain power from an included AC adapter, an optional DBK30A rechargeable battery module, or directly from a 12 VDC source (such as a car battery). The built-in power supply can serve a fully-configured system using bridge excitation.

For DaqBoard/2000 Series applications, DBK42 is typically powered from an included AC adapter. The unit's built in power supply can serve a fully-configured system using bridge excitation.

Each terminal block contains 4 terminals (per channel) for access to input and excitation features of 5B modules.

The optional CN-71 and CN-72 signal connection blocks provide a convenient way of connecting analog signals to the DBK42.

- **The CN-71 is for non-thermocouple use.**
- **The CN-72 (with cold junction sensors) is for thermocouple use.** The CN-72 has a clear plastic shield over its screw terminals to protect you from high voltage on the input terminals.

## Hardware Setup

### DBK42 Connection

The DBK42 has screw-terminal connectors for easy access to the analog inputs. 2-wire and 4-wire hookups are shown later in this section.

**Note:** Analog channels are isolated from each other, and no analog ground is provided.

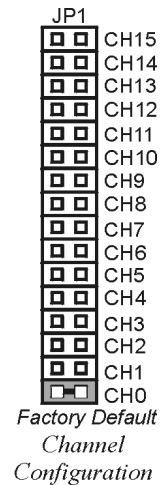
### DBK42 Configuration

Up to 16 DBK42s can connect to a LogBook or a Daq device. As a daisy-chain interface, each module must appear unique and use a different channel.

To configure the module, locate the 16x2-pin header (JP1) near the front of the DBK42 board. Note the 16 jumper locations labeled CH0 through CH15 representing the base Analog Input Channels. Place the jumper on the channel you wish to use.



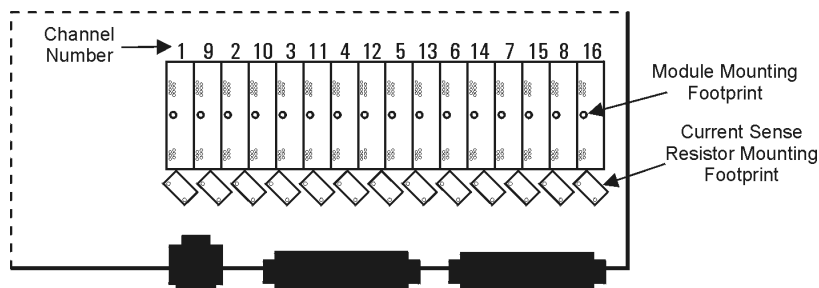
**Only one jumper is used on a single DBK42. No two cards in a system can use the same JP1 setting.**



### 5B Module Connection

Each input of the DBK42 is processed through a user-installed 5B signal-conditioning module. Different 5B modules are used with different transducer and signal sources. To install the modules:

1. Match the footprint of the module with the footprint on the circuit board (see figure).
2. Gently place the module into the footprint, and screw it down.
3. When installing current input modules (SC-5B32 series), install the supplied current-sense resistor (SC-AC-1362) in the resistor footprint adjacent to the module mounting footprint.
4. Record the module's channel number; label all units and connectors for identification.



Module Installation

## Power Considerations

The DBK42 has an internal, isolated switching-type power supply that operates on 10-20 VDC at varying input currents depending on the input voltage and 5B-module loading. The power drain at a given output load is constant; input current will vary inversely with the input voltage.

A DBK42 populated with strain-gage modules will draw more current than with other types of input modules. The table shows the DC input requirements for the worst-case setup (with 16 strain-gage modules or 16 thermocouple modules).

Input Volts	With Strain-Gage Modules	With Thermocouple Modules
	Input Amperes	Input Amperes
10 VDC	3.0 A	0.60 A
11 VDC	2.7 A	0.54 A
12 VDC	2.4 A	0.48 A
13 VDC	2.2 A	0.44 A
14 VDC	2.0 A	0.40 A
15 VDC	1.9 A	0.38 A
16 VDC	1.8 A	0.36 A
17 VDC	1.7 A	0.34 A
18 VDC	1.6 A	0.32 A
19 VDC	1.5 A	0.30 A
20 VDC	1.4 A	0.28 A

Power sources include:

- The standard TR-25 AC plug-in power pack (provided with the DBK42) can supply 900 mA at 15 VDC. The optional TR-40U can supply 2700 mA at 15 VDC.
- The DBK30A battery pack can supply power for a typical DBK42 configuration; however, in a fully-populated strain-gage configuration, the battery run-time will be limited to about 1½ hours.
- A 12 V lead-acid gel-cell type battery can easily power a fully-populated strain-gage configuration. The battery drain will be about 2.4 A-hr; battery size should be considered for systems with long run-times. (For example, a common-size 5.0 A-hr battery will operate for about 2 hours). A typical automotive 12-V lead-acid battery (e.g., 60 A-hr) can easily power a DBK42 for long run-times (about 24 hours).

The input fuse is a 4-A Slo-Blo 1-1/4" × 1/4" glass-type such as Littelfuse 313004 or Bussman MDL-4.

## Terminal Block Connection

Input signals (and excitation leads) must be wired to the DBK42 signal termination panel. Sixteen 4-terminal blocks accept up to 16 inputs. These connectors are located on a removable PC board that plugs into two DIN96 rectangular connectors on the rear panel.

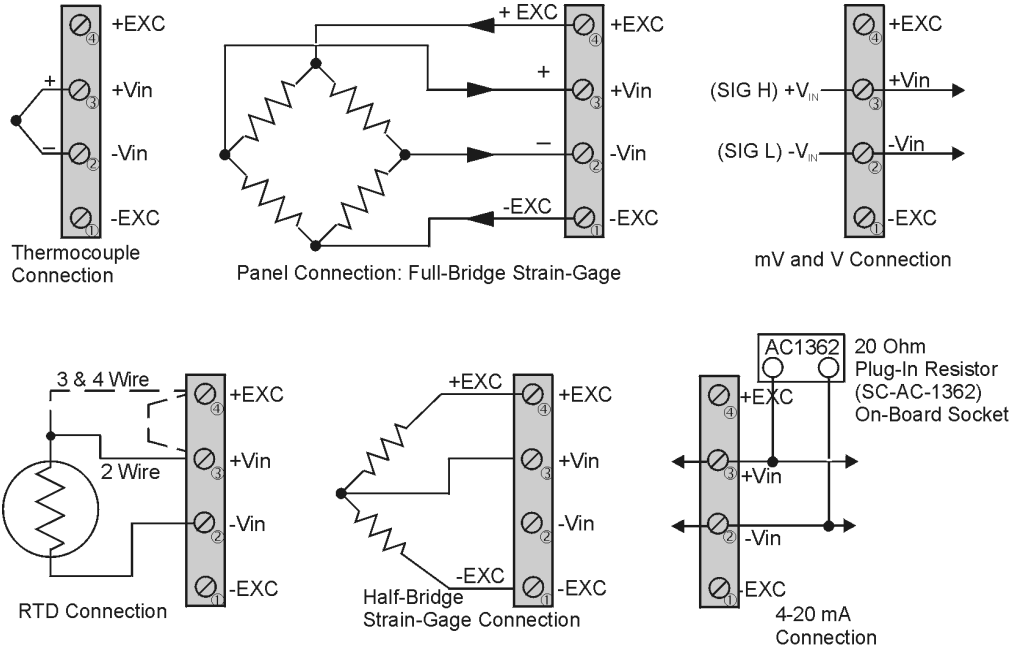
<b>WARNING</b>	
	<b>Shock Hazard! The DBK42 is designed to sense signals that may carry dangerous voltages. De-energize circuits connected to the DBK42 before changing the wiring or configuration.</b>

Terminal blocks are connected internally to their corresponding signal conditioning module. The terminal blocks accept up to 14-gage wire into quick-connect screw terminals. Terminals on each block are numbered 1 through 4. Each type of input signal or transducer (such as a thermocouple or strain gage) should be wired to its terminal block as shown in the figure. Wiring is shown for RTDs, thermocouples, 20 mA circuits, mV/V connections, and for full- and half-bridge strain gages.

## WARNING



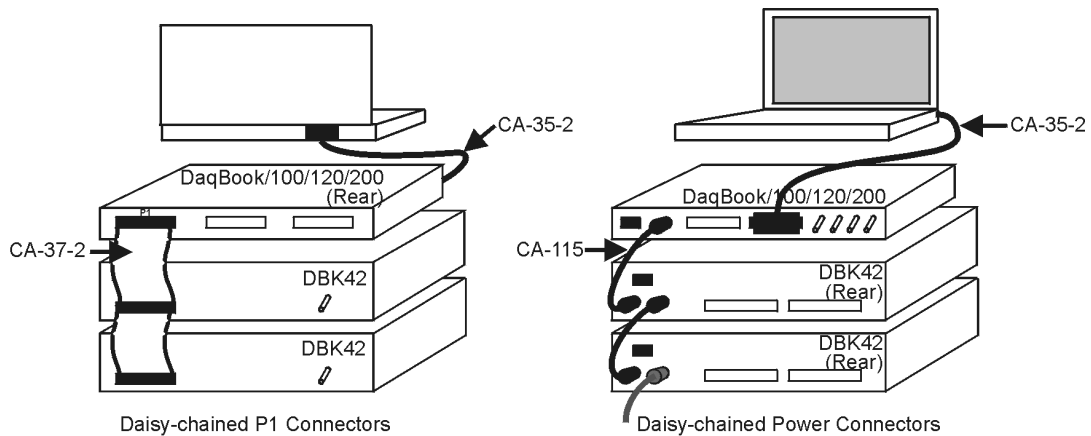
**Shock Hazard! The DBK42 is designed to sense signals that may carry dangerous voltages. De-energize circuits connected to the DBK42 before changing the wiring or configuration.**



*DBK42 Terminal Connections*

**P1 Connection.** The DBK42 attaches to the P1 analog I/O connector or to a DBK200 series P4-Adapter's P1 analog I/O connector. (Up to 16 units can be attached to one LogBook or Daq device.) Connect the appropriate ribbon cable (with -x indicating the number of cards to be connected) from the LogBook's, Daq device's, or adapter's P1 port to the DB37 connector at the end of the option card.

**Note:** A series of interface cables are available for connecting up to sixteen DBK42s.



*Daisy-Chaining DBK42s*

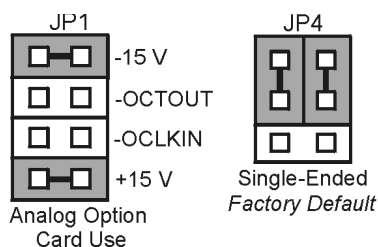
## DaqBoard/2000 Series and cPCI DaqBoard/2000c Series Connections

DBK42 can be connected to the P1 connector of DaqBoard/2000 Series P4-adapters. Up to 16 units can be attached to one DaqBoard/2000 Series board.

Connect the appropriate ribbon cable (with -x indicating the number of cards to be connected) from the adapter's P1 port to the DB37 connector at the end of the option card.

**Note:** A series of interface cables is available for connecting up to 16 DBK42s.

## DaqBook and ISA-Type DaqBoard Configuration



*DaqBook/DaqBoard Jumpers for DBK42*

The DBK42 requires two setup steps in DaqBooks and DaqBoards [ISA type]—jumpers JP1 and JP4.

1. If not using auxiliary power, place the JP1 jumper in the expanded analog mode.

**Note:** This default position is necessary to power the interface circuitry of the DBK42 via the internal  $\pm 15$  VDC power supply. If using auxiliary power (DBK32A, or DBK33), you must remove both JP1 jumpers (refer to chapter 2, *Power Management* and the DBK32A and DBK33 sections).

2. For DaqBook/100, /112, and /120 *only*, place the JP4 jumper in the DaqBook or ISA-type DaqBoard in *single-ended* mode. Analog expansion cards convert all input signals to single-ended voltages referenced to analog common.

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## Software Setup



### Reference Notes:

- **DaqView users** - Refer to [Chapter 4, DBK Setup in DaqView](#).
- **LogView users** - Refer to [Chapter 5, DBK Setup in LogView](#).

## mx+b Values for 5B Modules

The  $mx+b$  calculations for most 5B modules are included within LogView software. The table shows the  $m$  and  $b$  values for various 5B modules.

5B Module	m Value	b Value	Engineering Unit(s)
<b>Isolated Voltage Input (5 V Current Requirement, 30 mA)</b>			
SC-5B31-01	1/5	0	mV, V
SC-5B31-02	1	0	mV, V
SC-5B31-03	2	0	mV, V
SC-5B31-04	2/5	-1	mV, V
SC-5B31-05	2	-5	mV, V
SC-5B31-06	4	-10	mV, V
<b>Isolated Wideband Voltage (5 V Current Requirement, 30mA)</b>			
SC-5B41-01	1/5	0	V
SC-5B41-02	1	0	V
SC-5B41-03	2	0	V
SC-5B41-04	2/5	-1	V
SC-5B41-05	2	-5	V
SC-5B41-06	4	-10	V
<b>Isolated Millivolt Input (5 V Current Requirement, 30 mA)</b>			
SC-5B30-01	2	0	mV
SC-5B30-02	10	0	mV
SC-5B30-03	20	0	mV
SC-5B30-04	4	-10	mV
SC-5B30-05	20	-50	mV
SC-5B30-06	40	-100	mV
<b>Isolated Wideband Millivolt (5 V Current Requirement, 30 mA)</b>			
SC-5B40-01	2	0	mV
SC-5B40-02	10	0	mV
SC-5B40-03	20	0	mV
SC-5B40-04	4	-10	mV
SC-5B40-05	20	-50	mV
SC-5B40-06	40	-100	mV
<b>Isolated Linearized T/C Input (5 V Current Requirement, 30 mA)</b>			
SC-5B47-J-01	152	0	°C
SC-5B47-J-02	80	-100	°C
SC-5B47-J-03	100	0	°C
SC-5B47-K-04	200	0	°C
SC-5B47-K-05	100	0	°C
SC-5B47-T-06	100	-100	°C
SC-5B47-T-07	40	0	°C
SC-5B47-E-08	200	0	°C
SC-5B47-R-09	250	+500	°C
SC-5B47-S-10	250	+500	°C
SC-5B47-S-11	260	+500	°C
<b>Isolated RTD Input (5 V Current Requirement, 30 mA)</b>			
SC-5B34-01	40	-100	°C
SC-5B34-02	20	0	°C
SC-5B34-03	40	0	°C
SC-5B34-04	120	0	°C
SC-5B34-C-01	24	0	°C
SC-5B34-C-02	24	0	°C
SC-5B34-N-01	24	0	°C
<b>Isolated Current Input (5 V Current Requirement, 30 mA)</b>			
SC-5B32-01	3.2	4	mA
SC-5B32-02	4	0	mA
<b>Voltage Switch Input</b>			
SC-AC-1367	1	0	V

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## **DBK42 – Specifications**

**Name/Function:** 16-Slot 5B Signal Conditioning Module

**Module Capacity:** 16 (input only) 5B modules

**Size:** 8.5" × 11" × 3.5" (11" × 11" × 3.5" with optional CN-71 or CN-72)

**Weight:** 4 lb (with no modules installed)

**Cable (optional):** CA-37-1

**Power Requirements:** 10-24 VDC @ 2.6 - 0.3 A

With 16 thermocouple-type modules:

12 VDC @ 0.50 A

15 VDC @ 0.40 A

18 VDC @ 0.35 A

With 16 strain-gage type modules:

12 VDC @ 1.9 A

15 VDC @ 1.5 A

18 VDC @ 1.3 A

**DC Input Fuse:** 3A

**Power Indicator:** LED powered by internal 5 VDC

**Power Connection:** DIN5 ×2 for daisy-chaining

**AC Power Pack::**

120 VAC to 15 VDC converter

120 VAC to 15 VDC @ 2.0 A (optional)

**Input Connections:** DIN96 rectangular, standard, screw terminal adapter (optional)

**Connection:** Male DB37 mates via CA-37-1 cable with P1

**DC/DC Converter:** 10-24 VDC to 5 VDC (isolated)

**Isolation:**

Input Power to System: 500 VDC

Signal Inputs to System: 1500 VDC

Input Channel-to-Channel: 500 VDC

