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Find the *Measurement Computing / IOtech DBK15* at our website: *Click HERE*

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DO NOT adjust the potentiometers! Evidence of adjustment voids the factory warranty!

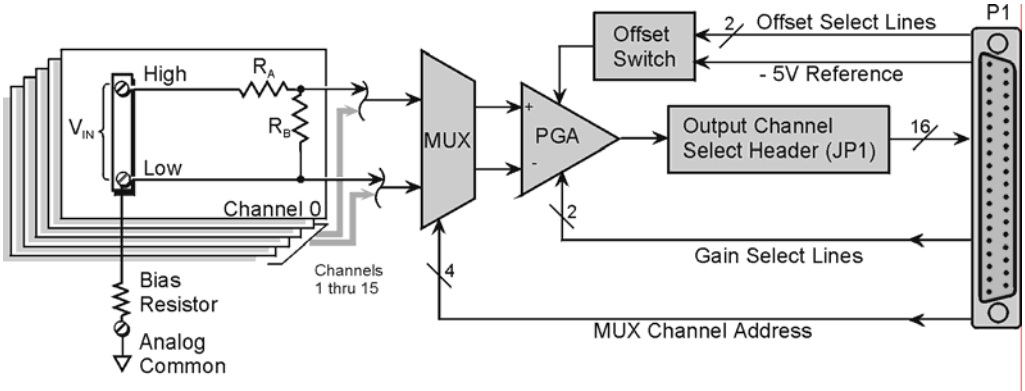
Reference Notes:

- Chapter 2 includes pinouts for P1, P2, P3, and P4. Refer to pinouts applicable to your system, as needed.
- In regard to calculating system power requirements, refer to *DBK Basics* located near the front of this manual.

Overview

DBK15 uses a 16-channel multiplexer and a programmable gain input amplifier (PGA). Component sockets accept resistors that configure each channel for current-to-voltage conversion or for voltage attenuation. The differential signal input from the transducer must use 3 leads: high, low, and common.

When configured by appropriate resistors, the DBK15 can measure voltages up to 30 VDC or currents up to 20 mA. Each of 16 input channels has a resistor "A" and "B" location. Installing various resistors in these locations yields channel-to-channel flexibility. The DBK15's input amplifier is software programmable for ×1 or ×2 gain per channel, providing unipolar 0 to +10 V or bipolar -5 to +5 V ranges per channel.

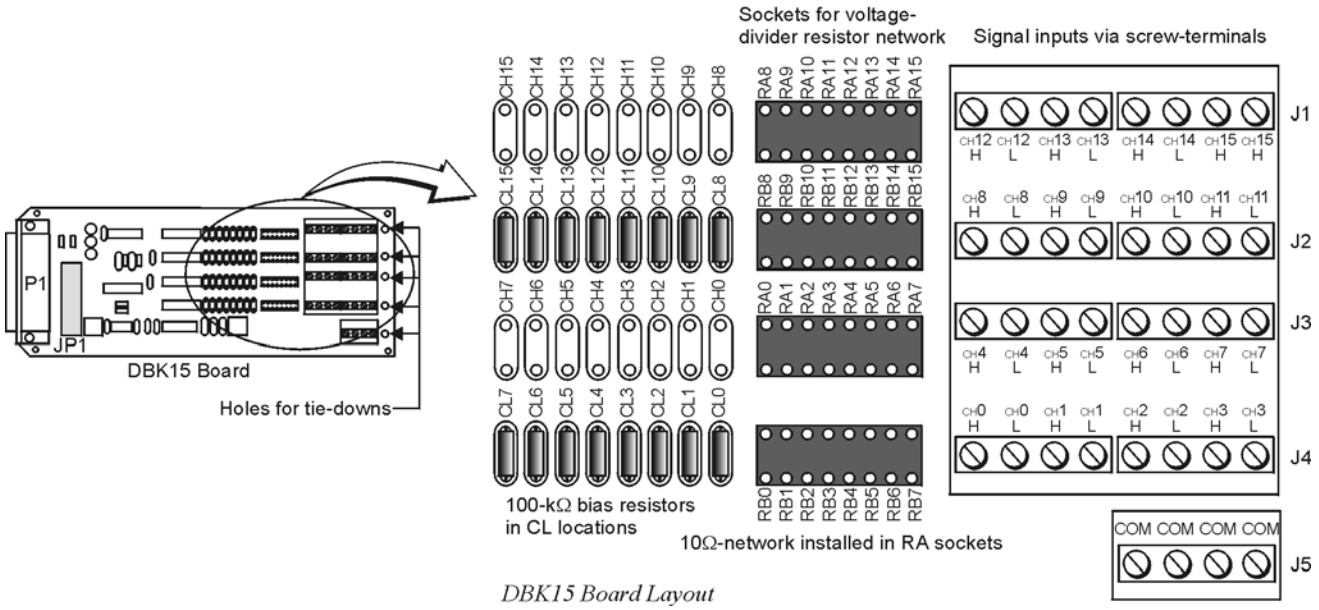


DBK15 Block Diagram

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Hardware Setup

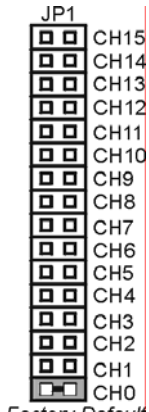
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DBK15 Board Layout

Card Configuration

Factory Default: Input range of ±5V



Factory Default Channel Configuration

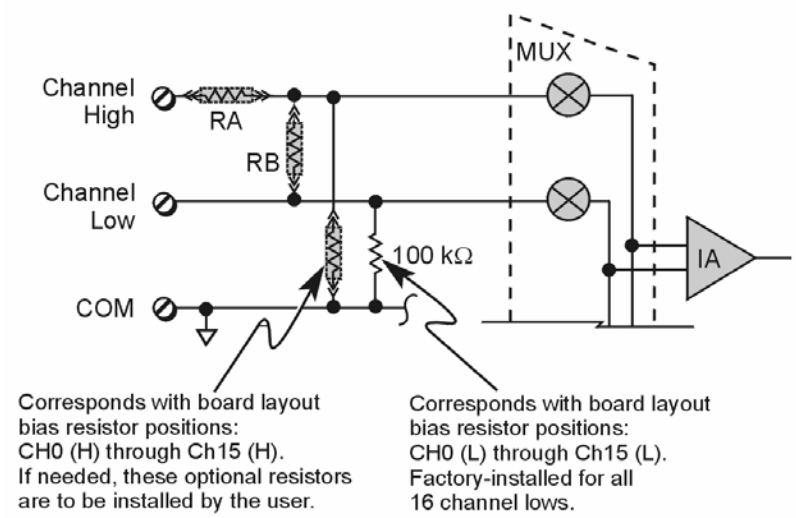
1. Determine the LogBook's or Daq device's Analog Input Channel for each DBK15 in your system. As few as one or as many as 16 DBK15's may be connected to your device. Since this is a daisy-chain type interface, each card must appear unique. This is accomplished by assigning each card to a different Analog Input on the LogBook or the Daq device.
2. Locate the 16×2 pin header labeled JP1 near the front of the board. Note the 16 jumper locations on this header labeled CH0 through CH15 corresponding to the LogBook's or Daq device's Analog Input Channels.
3. Set JP1 jumper on the pins for your intended output channel (CH0-CH15, see figure). Only one jumper is used on a single card. No two cards in the same system can have the same jumper setting.
4. On enhanced versions of this board, bias resistors have been installed between the channel lows and analog common. If you have an early version of the board, you can still install bias resistors. The use of bias resistors is discussed in the *Signal Management* chapter.
5. Determine values for R_A and R_B for each input signal channel. Standard RN55D (¼ watt, 1%, metal film) resistors or 22 gage bare wire (short) plug in pin sockets. See the following table.

   Note that a multiplexed input in sampled data systems must have low impedance to allow for accurate measurements. For 12-bit accuracy at 100 kHz, equivalent attenuator impedances should be less than 1 kΩ and signal sources must have impedances less than 1/4000 of the attennuator input impedance. For example, a 2:1 attenuator using 2 KΩ resistors will have 1 KΩ of equivalent impedance; but the source impedance must be less than 1/2 Ω (1/4000 of 2000) for 12-bit measurement accuracy to be attained.

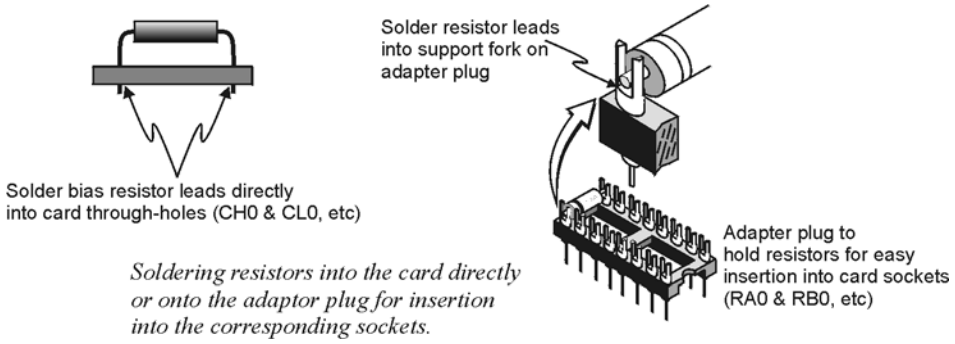
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Input Range	RA	RB	Gain	Polarity
±5 VDC	10 Ω Short	Open	×1	Bipolar
±10 VDC	2 KΩ	2 KΩ	×1	Bipolar
±30 VDC	10 KΩ	2 KΩ	×1	Bipolar
±20 mA	Short	249 Ω	×1	Bipolar
±20 mA	Short	124 Ω	×2	Bipolar
±2 mA	Short	1240 Ω	×2	Bipolar

6. Install resistors in R_A and R_B sockets for each channel as desired (see figures).



In voltage mode, RA and RB (installed by the user) form a resistor divider network. In current mode, RA is always shorted, RB is shunted with a resistor. 8 channels can be configured alike with 16-pin, 8-resistor DIP-8 resistor networks. With no resistors, DBK15 provides 16 differential voltage inputs for +5 V full-scale inputs. CL positions are used for bias resistors if necessary. Two differential measurement configurations can be used: floating or referenced differential. Refer to the *Signal Management* chapter for more information.



Soldering resistors into the card directly or onto the adaptor plug for insertion into the corresponding sockets.

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Card Connection

1. Connect the signal input wires to the appropriate screw terminals. The DBK15 is equipped with screw terminal connectors for easy access to inputs and ground access points. Connectors are provided for 16 differential inputs and are labeled by channel number and H and L for high and low analog inputs. On board, there are 100KΩ bias resistors in the CL locations per channel (the CH locations are not used). These resistors can be removed if desired.



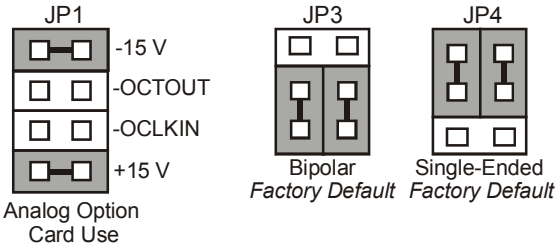
The DBK15 card only supports differential inputs (not single-ended). Connect the high end of the signal to the High input and the low end to the Low input of the desired channel. Ground referencing to Analog Common is important for optimum accuracy.

2. Use tie wraps (not included) and the board's edge-holes to secure all wires in a way that will not allow mechanical stress to affect the signal connection. In other words, be sure to provide a degree of slack, or "strain-relief."

DaqBook/100 Series & /200 Series and DaqBoard [ISA-Type] Configuration

Use of the DBK15 requires setting jumpers in DaqBooks/100 Series & /200 Series and DaqBoards [ISA type].

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



DaqBook/100 Series & /200 Series and DaqBoard[ISA-Type] Jumpers for the DBK15

Note: The JP1 default position is necessary to power the interface circuitry of the DBK5 via the internal ±15 VDC power supply. If using auxiliary power (e.g., DBK32A or DBK33), you must remove both JP1 jumpers. Refer to *Power Requirements* in the *DBK Basics* section and to the DBK32A and DBK33 sections as applicable.

2. For DaqBook/100, DaqBook /112 and DaqBook /120 *only*, place the JP3 jumper in *Bipolar mode*.
3. For DaqBook/100, DaqBook /112 and DaqBook /120 *only*, place the JP4 jumper in *single-ended mode*.

Note: Analog expansion cards convert all input signals to single-ended voltages referenced to analog common.

DaqBook/2000 Series and DaqBoard/2000 Series Configuration

No jumper configurations are required for these /2000 series devices.

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Software Setup

Reference Notes:

- **DaqView users** - Refer to chapter 3, *DBK Setup in DaqView*.
- **LogView users** - Refer to chapter 4, *DBK Setup in LogView*.

DaqView Users: When DBK15 is used with DaqBoard/2000 Series or /2000c Series Boards, the Internal Clock Speed must be set to 100 kHz as described in the *DaqView* document module.

DBK15 – Specifications

Name/Function: Universal Current/Voltage Input Card

Input Connectors: Screw terminals for signal connections

Output Connector: DB37 male, mates with P1 using CA-37-x cable

Attenuation/Shunt Resistor Connector: Machine sockets accommodate standard ¼-watt resistors

Gain Ranges: ×1, ×2

Inputs: 16 differential

Voltage Input Ranges: ±5 VDC max

Current Input Range: ±20 mA max

Attenuator Resistors:

Accuracy: +1%

Temperature Coefficient: 100 ppm/ºC

Gain Accuracy: ±0.05% typ, ±0.25% max

Maximum Input Voltage: ±35 VDC

Slew Rate: 10 V/µs

Settling Time: 2µs to 0.01%

CMRR: 80 dB min

Non-Linearity: 0.002% typ, 0.015% max

Unattenuated Bias Current: 150 pA typ, 0.2 µA max @ 25ºC

Offset Voltage:

±(0.5 + 5/G) mV @ 25ºC typ

±(2.0 + 24/G) Mv @ 25ºC max

Offset Drift:

±(3 + 50/G) µV/ºC typ

±(12 + 240/G) µV/ºC max

Note: Specifications are subject to change without notice.

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