

# DBK43A & DBK43B

## 8-Channel Strain Gage Modules



### Features

- Provide eight channels of strain gage input
- Accommodate most bridge-type sensors, including 4-element full and 3-wire quarter bridges
- Contain an individual excitation regulator per channel, and a user-selected low-pass filter

The DBK43 eight-channel strain gage expansion modules for IOtech's data acquisition systems accommodate most strain gage types, and configurations from single-element, 3-wire quarter bridges to 4-element full bridges and load cells. The DBK43 modules also include provisions for bridge completion resistors and provides four externally accessible adjustments on each of their eight channels, for excitation voltage, input gain, offset nulling, and output scaling.

The DBK43 modules include a built-in DC/DC converter, which lets the unit operate from an external power source and requires little power from the data acquisition system.

The DC/DC converter also provides excitation voltages for all channels. Each of the eight on-board excitation regulators can be externally adjusted from 1.5 to 10.5 VDC. The regulator outputs have remote sensing terminals and feature 50 mA current limiting to prevent damage from short-circuits or overloads. The wide regulator voltage range allows any resistor or semi-conductor type gage to be incorporated into a system.

**Input Amplifier.** Each DBK43's input amplifiers provide an input gain range of x100 to 1250. Input signals can vary widely in range, which makes the DBK43's a superior alternative to fixed-gain or slot-range amplifiers.

**Data Logging.** The DBK43B supports time-stamp mode when used with the LogBook. Although the DBK43A can be used with the LogBook, it does not support data timestamping.

DBK43A

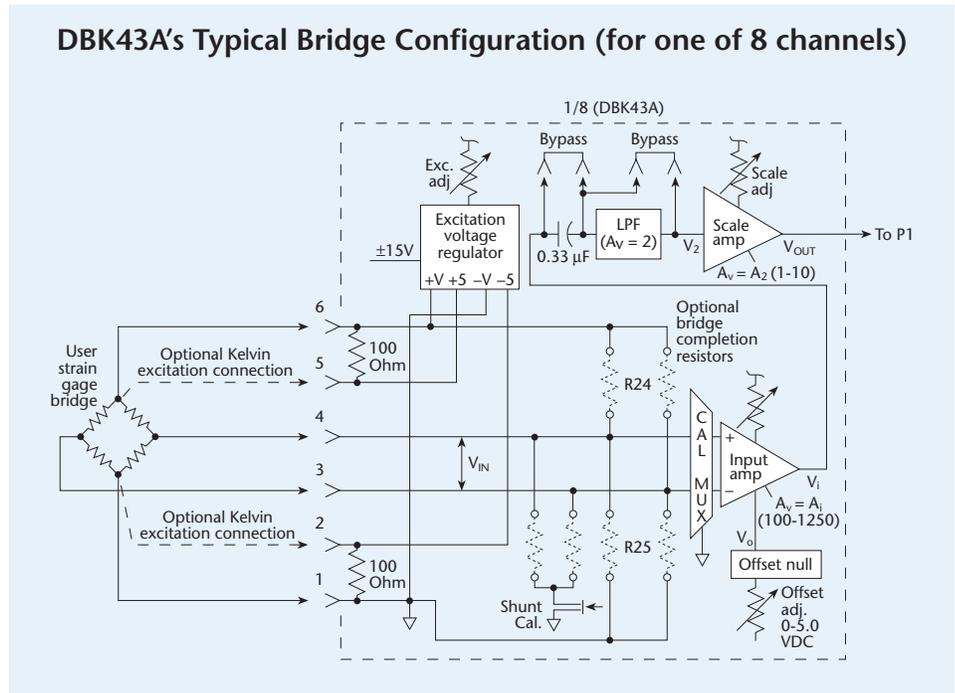


DBK43B



The DBK43 modules provide eight channels of strain gage input

### DBK43A's Typical Bridge Configuration (for one of 8 channels)



**Offset and Scaling Gain.** Each DBK43's 0 to 5 VDC offset adjustment range and output-gain scaling permit nulling of large quiescent loads and expansion of dynamic range for maximum resolution. This is an important feature because strain gages

typically exhibit pre-load or quiescent output, which leads to a non-zero output prior to the application of the load to be measured. The remaining signal can then be expanded by the DBK43's output scaling amplifiers to increase the resolution.

# DBK43A & DBK43B

## Specifications & Ordering Information



**Shunt-Calibration Feature.** The DBK43 modules offer locations in each channel amplifier for user-supplied shunt calibration resistors. This feature allows you to simulate, under software control, a pre-set bridge disturbance to aid in calibration and verification of each channel setting.

**Coupling and Filtering.** Each DBK43 channel features a user-selectable AC or DC coupling between the input amplifier circuits, and a selectable 3-pole, low-pass filter with user customizable cut-off frequency. Elective capacitive coupling, which is selected via user-installable jumpers, allows separation of dynamic signals from static deflection levels.

**Bridge-Completion Resistors.** Physical locations are provided for up to four bridge-completion resistors per channel, allowing you to accommodate most types of external configurations without having to attach bridge completion resistors to the strain gage.

**Connectivity.** The DBK43A provides molded cable connectivity to the unit, and a bare wire termination for connection to the strain gage sensor. The DBK43B has a modular screw-terminal connection for bare wire termination at both ends of the cable. The DBK43B allows for custom wire lengths and quick wiring re-configuration.

## Specifications

### Connectors

**DBK43A:** P1\* DB37; mini-DIN6 for strain-gage or external excitation connections

**DBK43B:** P1\*DB37; removable screw-terminal blocks for strain-gage or external excitation connections

**Number of Channels:** 8

**Operating Temperature Range**

**DBK43B:** -30 to +60 °C

**Excitation Voltage Adjustment Ranges:** 1.50 to 10.50 VDC @ 50 mA

**Input Gain Range:** x100 to 1250; separate instrumentation amplifier for each channel with gain adjustable via externally accessible 15-turn trimpot

### Accommodated Bridge Types

Full bridge, Kelvin excitation (6-wire)

Full bridge (4-wire)

Half bridge (3-wire)

Quarter bridge (3-wire)

**Bridge-Completion Resistors:** On-board resistor socket locations (Rn00A, Rn00B, Rn00C, Rn00E, Rn00F, and Rn00G) for 6 bridge-completion resistors per channel

**Input Type:** Differential

**Input Impedance:** 100 MOhm parallel with 100 pF

**CMMR:** 115 dB (DC to 60Hz.)

**Excitation Current Output:** 50 mA max (current limited @ 60 mA)

**Excitation Sensing:** Local or remote

**Excitation Regulation**

**Line Regulation:** 0.01% typ, 0.1% max

**Load Regulation:** 0.03% typ, 0.2% max

**Gain Calibration Reference:** 5 mVDC

**Gain Calibration Reference Accuracy:** 0.2%

**Gain Calibration Reference Drift:** 20 ppm/°C

**Gain Accuracy:** 0.5%

**Gain Drift:** 50 ppm/°C

**Input Offset:** 40 µV typ, 200 µV max (offset adjustable to zero)

**Input Offset Drift:** 1 µV/°C typ, 4 µV/°C max\*\*

**Output Offset:** 2 mV typ, 8 mV max (offset adjustable to zero)

**Output Offset Drift:** 100 µV/°C, 200 µV/°C max\*\*

**Offset Adjustment:** 0 to 100% of range, 0 to 5 VDC (15-turn trimpot)

### Full-Scale Sensitivity Range

**5.00 VDC Excitation:** 0.8 to 10 mV/V

**10.00 VDC Excitation:** 0.4 to 5 mV/V

**Scaling Amplifier Gain Range:** x1 to 10 (15-turn trimpot)

**Low-Pass Filter:** 3-pole, user-selected; corner frequency ( $F_c$ ) set by user component; attenuation -3 dB at  $F_c$ ; gain x2

**Power:** 9 to 18 VDC, external supply provided, 16 Watts maximum

**Dimensions:** 285 mm W x 221 mm D x 35 mm H (11" x 8.5" x 1.375")

**Weight:** 1.3 kg (3 lbs)

## Ordering Information

Description	Part No.
8-channel strain gage module	DBK43A
8-channel strain gage module with screw-terminal connection	DBK43B

### Accessories

120 Ohm bridge-completion resistor	BCR/120/1
350 Ohm bridge-completion resistor	BCR/350/1
1000 Ohm bridge-completion resistor	BCR/1000/1
Rack mount kit	RackDBK2
Additional blank header	CN-115

### Cables

Set of eight 6 ft. cables with mating mini-DIN 6 connector for DBK43A	CA-132
Molded T expansion cable; 2 in.	CA-255-2T
Molded T expansion cable; 4 in.	CA-255-4T
Ribbon cable, where x is the number of DBK devices attached	CA-37-x

**Note:** The CA-37-x ribbon cable can also be used in lieu of the CA-255-x molded T cables.



CA-132, eight strain gage cables for DBK43A

\* Attachment to the DaqBoard/2000 Series requires a DBK200, DBK202, DBK203A, DBK209, DBK213, or DBK214

\*\* Total drift (referred to inpt) is  $\text{Input Offset Drift} + \frac{\text{Output Offset Drift}}{\text{Input Gain (as set by trimpot)}}$