

Features

- 56 TC channels in one compact and rugged enclosure
- Supports any TC type on any channel
- Very low-cost per-channel and very high-channel density
- Attach up to 16 units together for up to 896 channels per A/D mainframe

The DBK90 Module provides 56 channels of high-accuracy thermocouple (TC) inputs*. The DBK90 is ideally suited for high channel count TC applications, with a maximum TC capacity of 896 channels per system. For larger channel-count applications, multiple mainframes can be combined for a maximum channel capacity of 3,584 channels.

Thermocouples attach to the DBK90 via mini-TC input connectors, and any supported TC type can be installed into any channel. Each row of 14 TC inputs has a separate cold-junction sensor to insure accurate readings. DBK90 modules are housed in a rugged all-metal package that can be mounted to the top of a DaqBook, DaqLab, or can be rack-mounted with an optional rack-mount kit. When multiple DBK90's are mounted together, a male and female P1 connector on either side of the unit provides all system connections so that only a single cable is required back to the A/D mainframe.



One DBK90 can measure up to 56 thermocouples of any type – up to 896 TC channels can be attached to one A/D mainframe

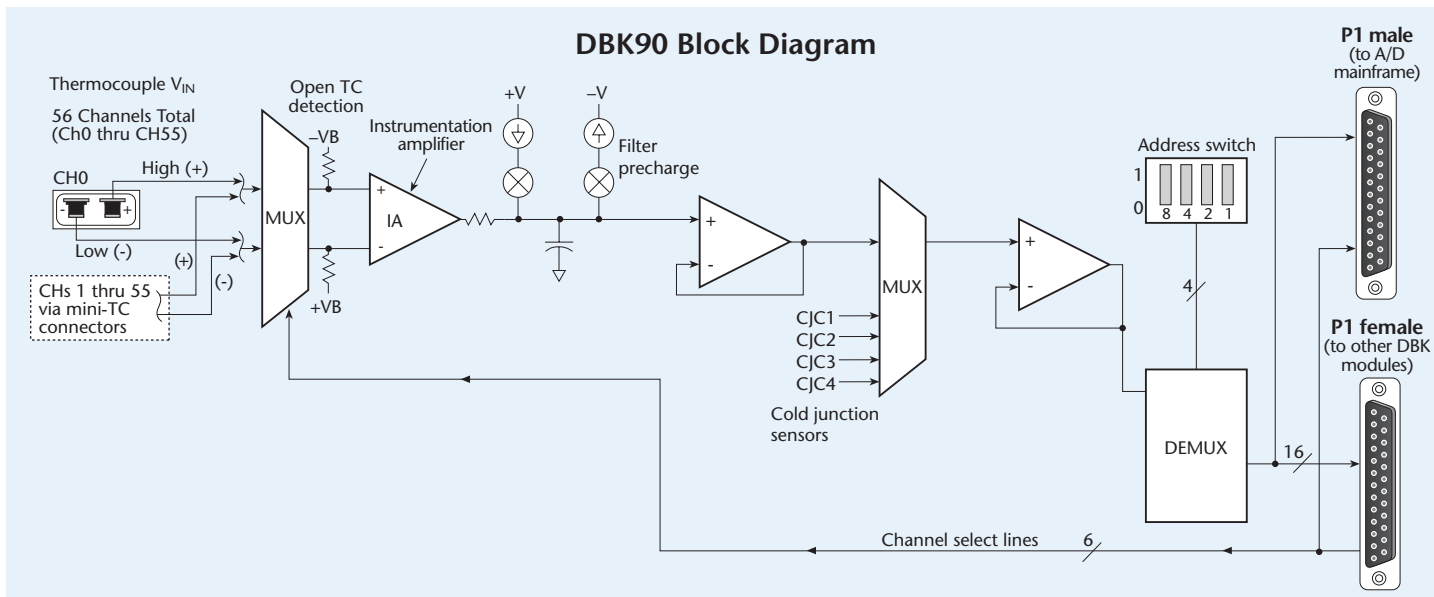
For distributed applications**, such as throughout the cabin of a vehicle, DBK90 modules can be mounted as separate units. Up to 20 ft. of cable can be used to connect DBK90 modules.

Each DBK90 has a built-in auto zero channel and a CJC channel. The DBK90 can measure one TC channel in 3 ms, 14 TC channels in 16 ms, and all 56 TC channels in 61 ms. A DBK90 based system of 896 channels can be measured in 976 ms. This speed is slower than other DBK modules to insure that the TC measurements

are accurate, low-noise, and stable. Typical measurement accuracies are better than 0.7°C, with channel-to-channel variation typically less than 0.5°C. If DBK90 measurements are mixed with measurements from other DBK options, the other measurements are made at their standard 5 or 10 µs/channel rate.

* Operation with a WaveBook requires a WBK40 or WBK41 option attached to the WaveBook/516E.

** The DBK90 is electrically non-isolated. For applications requiring TC connections to high common mode voltage, use isolation modules with the appropriate DBK carrier module.



DBK90

Specifications & Ordering Information

Specifications

System Compatibility: Attaches to DaqBook/2000 Series, DaqLab/2000 Series, DaqScan/2000 Series, or WaveBook/618E via WBK40 or WBK41

System Connector: Male and female DB37 for unit-to-unit mating and mating with P1 on the acquisition mainframe

TC Connector: Mini-TC connectors

ACOM Connector Type: Pomona model 5936-0

Inputs: 56 differential TC inputs, open TC detection per channel

TC Types: J, K, T, E, S, R, B, N28, N14

Speed: 1 channel in 3 ms, 14 channels in 16 ms, 56 channels in 6ms (see sample rate insert for calculating total system sample rates)

Dimensions: 285 mm W x 88 mm D x 52 mm H (11" x 3.44" x 2.05")

Weight: 0.96 kg (2.12 lbs)

Power Requirements: 40 mA max from $\pm 15V$; 60 mA max from $+5V$

Input Impedance: 4M Ohm (differential) in parallel with 400pF; non-isolated

DBK90 Maximum Channel Capacity			
Mainframe Product Family	Max. Ch. Capacity per Mainframe	Max. Ch. Capacity per System	Max. DBK90 Power Capacity per Mainframe†
DaqBook/2000 Series	896 (16 DBK90s)	3,584* (64 DBK90s)	6 DBK90s
WaveBook/WBK40/41	854 (15 DBK90s)	2,562** (45 DBK90s)	10 DBK90s

* Presumes 4 DaqBook mainframes per system

** Presumes 3 WBK40/41 mainframes attached to one WaveBook/516E

† Presumes no other active DBK modules are attached. A DBK32A power supply is necessary to power additional DBK90s or other active DBK options.

Input Bandwidth: 1 kHz

Minimum Resolution: 0.1 °C for all TC types

TC Accuracy††: Valid for one year at 25 °C ambient, see table below

Operating Temperature: -30 to +70 °C

Relative Humidity: 0 to 95% non-condensing

Temperature Coefficient of Accuracy for Type T TC: ± 0.05 °C for every °C away from 25 °C

Channel-to-Channel Crosstalk: -90 dB typ (0 to 100 Hz)

DC CMRR: -80 dB typ

AC CMRR: -80 dB typ (0 to 60 Hz)

Maximum Common Mode Voltage: $\pm 10V$

Over-Voltage Protection: $\pm 40V$

TC Accuracy at Measurement Temperature in °C (±°C)											
Type	Min	Max	-100	0	100	300	500	700	900	1100	1400
J	-200	760	0.8	0.7	0.7	0.8	0.9	0.9	—	—	—
K	-200	1200	0.9	0.8	0.8	0.9	1.1	1.1	1.2	1.3	—
T	-200	400	0.9	0.8	0.8	0.8	—	—	—	—	—
E	-270	650	0.8	0.7	0.7	0.7	0.8	—	—	—	—
S	-50	1768	—	3.1	2.4	2.0	2.0	1.9	2.0	2.1	2.1
R	-50	1768	—	3.1	2.1	2.0	1.9	1.9	1.7	1.9	2.0
B	50	1780	—	—	—	4.9	3.2	2.8	2.4	2.3	2.0
N28	-270	400	1.2	0.9	0.9	0.9	—	—	—	—	—
N14	0	1300	—	0.9	0.9	0.9	1.1	1.1	1.2	1.3	—

†† Accuracy conditions:

- Exclusive of thermocouple errors
- Exclusive of noise
- VCM=0
- 25 °C ambient temperature, stabilized for 1 hour

Ordering Information

Description

56-channel thermocouple input module

Part No.
DBK90

Accessories & Cables

Mounting kit for mounting one DBK90 to another DBK90

1109-0800

Rack-mount kit for rack mounting one DBK90

1109-0801

Mounting kit for attaching 1 or 2 DBK90 modules on top of a DaqBook which has no protective ears

1109-0802

Mounting kit for attaching 1, 2, or 3 DBK90 modules on top of a DBK60 which has no protective ears

1109-0803

Molded corner mounting kit for attaching 1 or 2 DBK90 modules on top of a DaqBook which has protective ears

1109-0804

Shielded ribbon cable recommended for scenarios in which signal noise is a problem; 7 in

CA-143-7

Shielded ribbon cable recommended for scenarios in which signal noise is a problem; 18 in

CA-143-18

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.



Two DBK90s (112 TC channels) mounted on a DaqBook/2020



One DBK90 (56 TC channels) with rack-mount option