



# DBK90™

## 56-Channel Thermocouple Input Module



Compatibility: ✓ WBK40/41 ✓ DaqBook ✓ DaqLab ✓ DaqScan

### 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 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 WaveBook, 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.



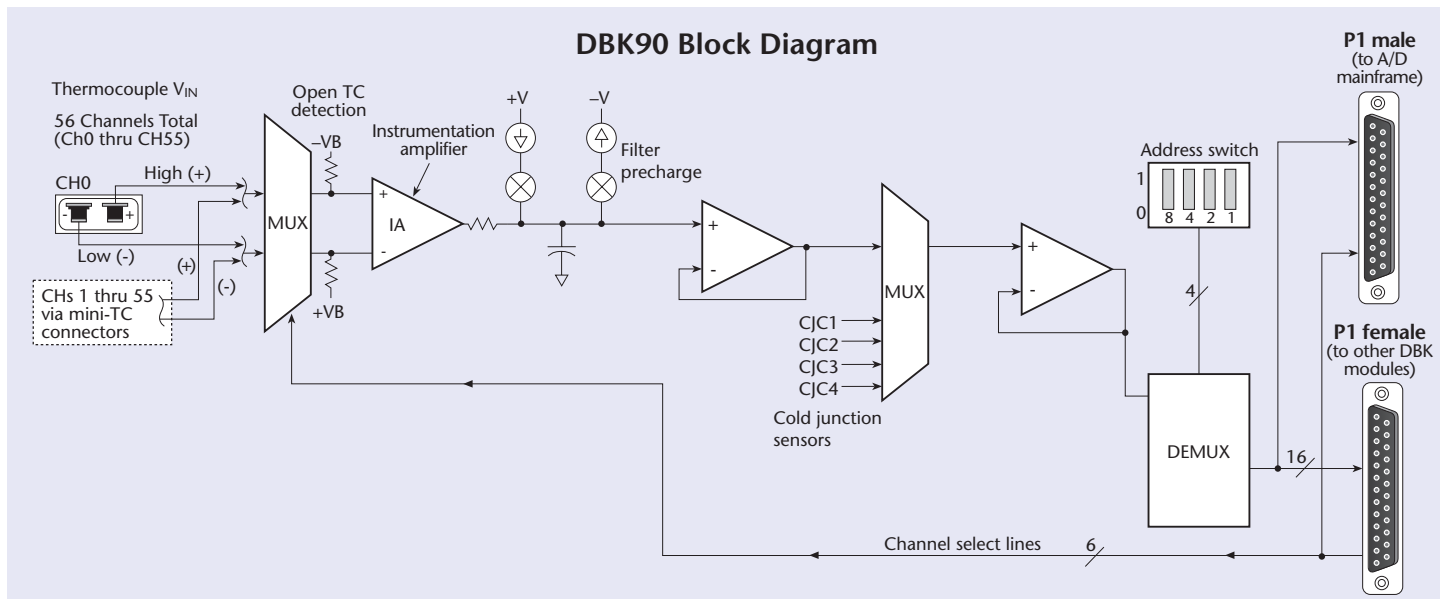
*One DBK90 can measure up to 56 thermocouples of any type – up to 896 TC channels can be attached to one A/D mainframe*

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 can be 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. Contact factory for DaqBoard/2000 series and LogBook support.





# 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

**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 ±15V; 60 mA max from +5V

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 Impedance:** 4M Ohm (differential) in parallel with 400pF

**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°C 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:** ±10V

**Over-Voltage Protection:** ±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	—



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

†† 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 1109-0801  
 Mounting kit for attaching 1 or 2 DBK90 modules on top of a DaqBook or WaveBook 1109-0802  
 Mounting kit for attaching 1, 2, or 3 DBK90 modules on top of a DBK60 1109-0803  
 Molded corner mounting kit for DBK90 modules 1109-0804  
 Shielded P1 T cable for use with DaqBook/2020, DaqBook/2001, DaqBook/2005, and WBK40/41 CA-255-2T  
 Shielded P1 T cable for use with LogBook/300, DaqLab/2001, and DaqLab/2005 CA-255-4T  
 Ribbon cable for use with DaqScan CA-37-x

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



Up to three DBK90 modules (168 TC channels) can be mounted on top of a DBK60. Mating male/female P1 connectors on the DBK90 minimize the amount of system cabling required.



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

7 DBK Signal Conditioning Options