DBK90
56-Channel Thermocouple Input Module

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

TC Accuracy at Measurement Temperature in °C (±°C)

<table>
<thead>
<tr>
<th>Type</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>-200</td>
<td>760</td>
</tr>
<tr>
<td>K</td>
<td>-200</td>
<td>1200</td>
</tr>
<tr>
<td>T</td>
<td>-200</td>
<td>400</td>
</tr>
<tr>
<td>E</td>
<td>-270</td>
<td>650</td>
</tr>
<tr>
<td>S</td>
<td>-50</td>
<td>1768</td>
</tr>
<tr>
<td>R</td>
<td>-50</td>
<td>1768</td>
</tr>
<tr>
<td>B</td>
<td>50</td>
<td>1780</td>
</tr>
<tr>
<td>N28</td>
<td>270</td>
<td>400</td>
</tr>
<tr>
<td>N14</td>
<td>0</td>
<td>1300</td>
</tr>
</tbody>
</table>

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

DBK90 Maximum Channel Capacity

<table>
<thead>
<tr>
<th>Mainframe Product Family</th>
<th>Max. Ch. Capacity per Mainframe</th>
<th>Max. Ch. Capacity per System</th>
<th>Max. DBK90 Power Capacity per Mainframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>DaqBook/2000 Series 896 (16 DBK90s)</td>
<td>3,584* (64 DBK90s)</td>
<td>6 DBK90s</td>
<td></td>
</tr>
<tr>
<td>WaveBook/WBK40/41 854 (15 DBK90s)</td>
<td>2,562** (45 DBK90s)</td>
<td>10 DBK90s</td>
<td></td>
</tr>
</tbody>
</table>

Ordering Information

Description
Part No.
56-channel thermocouple input module
DBK90

Accessories & Cables

Mounting kit for mounting one DBK90 to another DBK90
1109-0800
1109-0801
Mounting kit for rack mounting one DBK90
Mounting kit for attaching 1 or 2 DBK90 modules on top of a DaqBook which has no protective ears
Mounting kit for attaching 1, 2, or 3 DBK90 modules on top of a DBK60 which has no protective ears
Molded corner mounting kit for attaching 1 or 2 DBK90 modules on top of a DaqBook which has protective ears
Shielded ribbon cable recommended for scenarios in which signal noise is a problem; 7 in
Shielded ribbon cable recommended for scenarios in which signal noise is a problem; 18 in
Molded T expansion cable; 2 in.
Molded T expansion cable; 4 in.
Ribbon cable, where x is the number of DBK devices attached

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