16-Channel Thermocouple Input Board

CE

DAS-TC shown with STA-TC Screw Terminal Box and C-1800 Cable

IBM PC

A/IN

DAS-TC $1209

Shown smaller than actual size

INCLUDING SCREW PANEL

✔ **Accepts J, K, T, E, R, S and B Thermocouple, Millivolt and Voltage**

✔ **Onboard Microprocessor Linearizes and Converts Readings To Degrees or Volts**

✔ **User Programmable Per Channel Averaging**

✔ **Resolution Greater Than 15 Bits (<0.1°C for J Type)**

✔ **High Accuracy and Repeatability**

✔ **Automatic Cold Junction Compensation**

✔ **Programmable Line Rejection Rates for High Noise Immunity**

DAS-TC is an easy-to-use, highly accurate IBM PC and compatible plug-in solution for measuring thermocouple and voltage inputs. The DAS-TC can measure any mix of J, K, T, E, R, S, and B type thermocouples, millivolt and voltage inputs. Up to 16 differential inputs are provided as well as one cold junction compensation (CJC) sensor input. Automatic calibration, gain selection, CJC, thermocouple linearization, conversion to degrees or volts, and averaging are performed by an onboard microprocessor.

A voltage-to-frequency (V/F) converter allows highly accurate and stable thermocouple readings even in noisy environments. Programmable rejection rates can be selected to match the line voltage for best noise immunity. The input and measurement section is also isolated to prevent damage to the computer from high common mode voltages.

A configuration utility is supplied with the DAS-TC that allows each channel to be set up for thermocouple type or voltage input, °C or °F, number of readings to average, and the board's rejection rate. This file is downloaded into memory upon initialization of the board. Channels configured as thermocouple inputs are converted to temperature measurements by the on-board microprocessor which adjusts for the CJC reading.

The DAS-TC is calibrated automatically upon initialization and periodically thereafter. A precision voltage reference determines the gain error and offset coefficients. These coefficients are stored in the onboard memory and are used to adjust the measurements of the DAS-TC. The CJC sensor is read at initialization and during calibration and this value is also stored in memory.

The DAS-TC standard software package, which is supplied with the board, includes everything needed to install, configure, test, calibrate, and program the board using a DOS-based BASIC language. The utility and driver software provided with the DAS-TC makes the board easy to use. You can program the DAS-TC in a variety of DOS and Windows-based languages using the high level Function Call Drivers.

The standard software includes the following:

- Datalogger utility which allows application testing, and logging data to a file
- DAS-TC installation and configuration programs
- Function Call Driver which is compatible with QuickBASIC, Professional BASIC, and Visual Basic for DOS
- Example programs for all supported languages
- Calibration utility

ADVANCED SOFTWARE

The ASO-TC extends the DAS-TC's language support to C and Pascal under DOS and all Windows programming languages. It includes a Function Call Driver, which is supplied in multiple forms to support the different languages. The Datalogger and configuration utilities are also supplied in Windows versions. The following DOS languages are supported Microsoft C/C++, Borland C/C++ and Turbo Pascal. Windows 3.X languages supported are Borland C/C++ and Turbo Pascal for Windows, Microsoft Quick C and Visual Basic for Windows.

ASO-TC Function Call Driver provides a complete set of functions

to allow access to all features and operations of the DAS-TC. A Microsoft Window's 3.X Dynamic Link Library (DLL) is also provided for programming in Windows-based languages. By supplying the DAS-TC drivers as a standard DLL, DAS-TC application programs can take advantage of all Windows features.
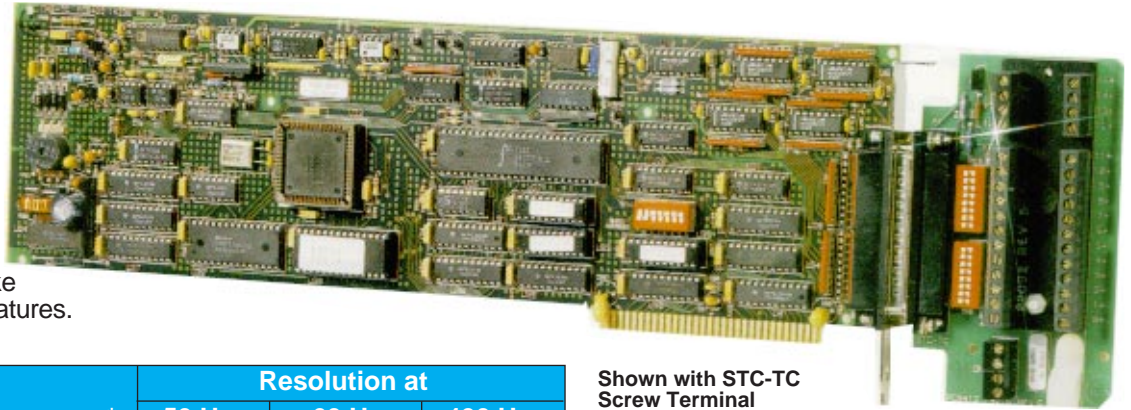
Shown with STC-TC Screw Terminal Connector.

Thermocouple Input

Type	Ranges	Accuracy*	Resolution at		
			50 Hz	60 Hz	400 Hz
J	-200 to -1°C	±1.0°C	0.1°C	0.1°C	0.7°C
	0 to +750°C	±0.5°C	0.04°C	0.05°C	0.3°C
K	-200 to -1°C	±1.4°C	0.1°C	0.2°C	1.0°C
	0 to +900°C	±0.7°C	0.05°C	0.06°C	0.4°C
	+901 to +1250°C	±0.9°C	0.06°C	0.07°C	0.5°C
E	-200 to -50°C	±1.1°C	0.1°C	0.1°C	0.8°C
	-49 to +1000°C	±0.6°C	0.05°C	0.05°C	0.4°C
T	-200 to -120°C	±0.9°C	0.05°C	0.06°C	0.4°C
	-119 to +400°C	±0.5°C	0.03°C	0.04°C	0.2°C
R	0 to +299°C	±2.3°C	0.1°C	0.2°C	1.0°C
	300 to +1768°	±1.5°C	0.08°C	0.1°C	0.6°C
S	0 to +299°C	±2.3°C	0.1°C	0.2°C	1.0°C
	300 to +1450°C	±1.7°C	0.09°C	0.1°C	0.7°C
B	400 to +799°C	±3.0°C	0.2°C	0.2°C	1.5°C
	800 to +1700°C	±1.7°C	0.1°C	0.1°C	0.8°C

Accuracy values do not include Cold Junction Compensation error.

Voltage Input

Gain	Range	Accuracy	Resolution at		
			50 Hz	60 Hz	400 Hz
1	-2.5 V to +10 V	±0.01% rdg ±2.5 mV	312.5 µV	375 µV	2.5 mV
125	-20 mV to +80 mV	±0.02% rdg ±26 µV	2.5 µV	3.0 µV	20 µV
166.7	-15 mV to +60 mV	±0.02% rdg ±22 µV	1.88 µV	2.25 µV	15 µV
400	-6.25 mV to 25 mV	±0.03% rdg ±12.5 µV	0.781 µV	0.938 µV	6.25 µV

Conversion Rates

Rejection Rate	Thermocouples	Voltages
50 Hz	47 ms/channel	43 ms/channel
60 Hz	40 ms/channel	36 ms/channel
400 Hz	10 ms/channel	6 ms/channel

Conversion speed includes the time to acquire a reading, and for thermocouples, the time to linearize and compensate for the CJC, and convert to degrees or volts in integer format. For floating point format, add 1 ms to each value.

To Order *(Specify Model Number)*

Model No.	Price	Description
DAS-TC	$999	16 channel thermocouple, mV and Voltage input board with BASIC functions, call drivers and utility programs
STA-TC	180	Screw terminal accessory board, includes, plastic enclosure. Requires C-1800 cable
STC-TC	200	Screw terminal connector, plugs directly on the DAS-TC I/O connector
C-1800	30	DAS-TC to STA-TC interface cable
ASO-TC	99	Advance software package includes function call drivers and Windows 3.X DLL, 3.5" and 5.25" disks provided

Ordering Example: *DAS-TC Plug in board, STA-TC external terminal board with plastic housing, C-1800 interconnecting cable, $999 + 180 + 30 =* ***$1209.***

Specifications
Channels: 16 Differential inputs; 1 Cold Junction Compensation

Gain Error Temperature Coefficients:
Thermocouple Inputs:

J, K	±12 ppm/°C
E	±10 ppm/°C
T, R, S, B	±17 ppm/°C

Voltage Input:

-2.5 V to +10 V	±7 ppm/°C
-20 mV to +80 mV	±10 ppm/°C
-15 mV to +60 mV	±12 ppm/°C
-6.25 mV to 25 mV	±17 ppm/°C

Cold Junction Compensation Error: ±0.5°C max. (@ 25°C); ±1.2°C max. (@ 0 to 70°C)

Temperature Units: °C or °F (user programmable)

Noise:
G = 1: 0.75 x resolution rms
G = 125, or Type E TC: 1.0 x resolution rms
G = 166, or Type J, K TC: 1.5 x resolution rms
G = 400, or Type T, B, S, R TC: 4.0 x resolution rms

Input Impedance: 100MΩ min.

Over Voltage Protection: ±30 V max. powered; ±20 V max. unpowered

Common Mode Rejection Ratio: Voltage Range Gain = 1:72 dB min. (dc to 60 Hz); All other ranges: 100 dB min. (dc to 60 Hz)

Normal Mode Rejection Ratio: 55 dB min. @ 50/60 Hz

Input Isolation from PC: 500 Vdc min.

Temperature/Voltage Data Format: Integer, 32-bit signed; real 32-bit IEEE-754 standard floating point

Power Requirements: +5 Vdc, 950 mA typ/1500 mA max.; +12 Vdc, 25 mA typical; 50 mA max.

Operating Temperature: 0 to 50°C

Storage Temperature: -20 to 70°C

Humidity: 0 to 95% non-condensing

Dimensions: 33.8 L x 10.8 H x 1.9 cm D (13.3" x 4.25" x 0.75")

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