PCI-DAS-TC

Specifications

Document Revision 1.1, February, 2010

Specifications

Typical for 25 °C unless otherwise specified.

Specifications in *italic text* are guaranteed by design.

Analog input

Table 1. Analog input specifications

A/D converter type	AD652 V/F converter
Number of channels	16 differential thermocouple inputs, 1 CJC input
Programmable ranges	–2.5 V to +10 V, –20 mV to +80 mV, –15 mV to +60 mV, –6.25 mV to 25 mV
Voltage gains	1, 125, 166.7, 400
Thermocouple types	J, K, E, T, R, S, B
A/D pacing	Continuous conversions. Software-programmable for 50 Hz, 60 Hz, or 400 Hz
A/D trigger sources	Software-triggered
Data transfer	Single I/O register transfer through dual port RAM
Conversion rates (integrating time)	50 Hz, 60 Hz, 400 Hz Software programmable
**Conversion rates (per channel)*	*25.0 msec @ 50 Hz typical, 25.5 msec maximum* *21.6 msec @ 60 Hz typical, 22.1 msec maximum* *7.4 msec @ 400 Hz typical, 7.9 msec maximum* **This is the total time to convert the channel, process the data, and provide a delay to switch the gain and channel.*
Linearity error (A/D specs)	*±0.05% @ 4 MHz clock*
Gain drift (A/D specs)	*±75 ppm/°C max*
Zero drift (A/D specs)	*±50 uV/°C max*
Power supply rejection ratio	*0.01 %/V*
Overvoltage protection	*–40 V to +55 V*
CMRR @ 60 Hz	80 dB minimum
Input leakage current	±80 nA maximum
Input impedance	100 MegOhm minimum
Absolute maximum input voltage	*–40 V to +55 V*
Isolation to PC	*500 V min through DC/DC converter and opto-isolators*

Accuracy and resolution

Table 2. Voltage measurements

Gain	Range	Accuracy (Worst Case)	Resolution		
			@ 50 Hz	@ 60 Hz	@ 400 Hz
1	–2.5 to 10 V	±0.01% of reading ±2.5 mV	312.5 µV	375 µV	2.5 mV
125	–20 to 80 mV	±0.01% of reading ±20 µV	2.5 µV	3.0 µV	20.0 µV
166.7	–15 to 60 mV	±0.01% of reading ±15 µV	1.88 µV	2.25 µV	15.0 µV
400	–6.25 to 25 mV	±0.02% of reading ±6.25 µV	0.781 µV	0.938 µV	6.25 µV

Table 3. Thermocouple measurements (not including CJC errors)

TC Type	Range	Accuracy (Worst Case)	Resolution		
			@ 50 Hz	@ 60 Hz	@ 400 Hz
J	0 to 750 °C	±0.5 °C	0.05 °C	0.05 °C	0.40 °C
K	–200 to 1250 °C	±1.4 °C	0.04 °C	0.05 °C	0.40°C
E	–200 to 900 °C	±1.1 °C	0.03 °C	0.04 °C	0.25 °C
T	–200 to 350 °C	±0.9 °C	0.03 °C	0.04 °C	0.25 °C
R	0 to 1450 °C	±2.3 °C	0.06 °C	0.07 °C	0.44 °C
S	0 to 1450 °C	±2.3 °C	0.06 °C	0.08 °C	0.52 °C
B	0 to 1700 °C	±3.0 °C	0.07 °C	0.08 °C	0.54 °C

Miscellaneous

Table 4. Miscellaneous specifications

Averaging	Moving average, 1 to 16 samples, software-selectable
Calibration	Calibration is performed with each channel scan to remove offset and gain error. CJC channel is also measured with each calibration.
Processor reset	On power-up, watchdog timeout, or software command. Processor boots within one second of reset. Active low.
Watchdog timer	1.6 seconds nominal. Processor generates watchdog disable signal after boot-up.
Temperature units	Programmable for conversion to °C or °F
Interrupts	INTA# mapped to IRQn by PCIBIOS at boot time
Interrupt enable	Programmable
Interrupt sources	Dual port RAM when the processor mailbox has data.

Crystal oscillator

Table 5. Crystal oscillator specifications

Frequency	*32 MHz*
Frequency accuracy	*100 ppm*

CIO-STA-TC adapter

Table 6. CIO-STA-TC adapter specifications

CJC type	AD592CN
Configuration	CJC centered in an isothermal block on which the screw terminals have been mounted.
Channels	16 (plus CJC output)

Calibration error

Table 7. Calibration error specifications

@ 25 °C	0.3 °C typical, 0.5 °C maximum
25 °C to +105 °C	0.5 °C typical, 1.0 °C maximum

Linearity error

Table 8. Linearity error specifications

–25 °C to +105 °C	0.1 °C typical, 0.35 °C maximum
Temperature coefficient	*1 µA/°C typical*
Long term stability	0.1 °C / month
Open thermocouple detect	On/off switch selectable for each channel, full scale reading

Power consumption

Table 9. Power consumption specifications

+5 V operating	887 mA typical, 1441 mA maximum

Environmental

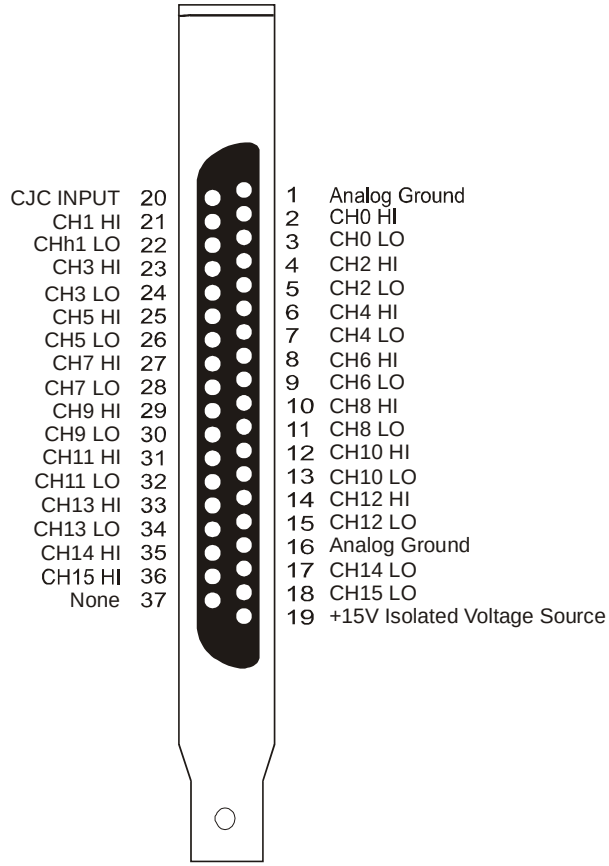
Table 10. Environmental specifications

Operating temperature range	0 to 50 °C
Storage temperature range	–20 to 70 °C
Humidity	0 to 90% non-condensing

Main connector and pin-out

Table 11. Main connector specifications

Connector type	37-pin D-type
Compatible cable	C37FFS-*x*
Compatible accessory product (with C37FFS-x cable)	CIO-STA-TC screw terminal adapter board


CJC INPUT 20
CH1 HI 21
CHh1 LO 22
CH3 HI 23
CH3 LO 24
CH5 HI 25
CH5 LO 26
CH7 HI 27
CH7 LO 28
CH9 HI 29
CH9 LO 30
CH11 HI 31
CH11 LO 32
CH13 HI 33
CH13 LO 34
CH14 HI 35
CH15 HI 36
None 37
1 Analog Ground
2 CH0 HI
3 CH0 LO
4 CH2 HI
5 CH2 LO
6 CH4 HI
7 CH4 LO
8 CH6 HI
9 CH6 LO
10 CH8 HI
11 CH8 LO
12 CH10 HI
13 CH10 LO
14 CH12 HI
15 CH12 LO
16 Analog Ground
17 CH14 LO
18 CH15 LO
19 +15V Isolated Voltage Source

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