

Analog input module

AI

M1-33D

2 thermocouple inputs / ± 100 mVDC

- ▶ Two 16-bit ± 100 mVDC analog inputs
- ▶ Optically and electrically isolated
 - Each channel has an electrically isolated analog ground
 - Each channel is individually optically isolated
- ▶ Two differential-ended inputs for use with both grounded or ungrounded tip thermocouples
- ▶ Thermocouple linearization algorithms: E, K, J, R, S, T
- ▶ Each channel has individually configurable digital filtering

General specifications

Inputs per module	2 differential-ended
Input type	Thermocouple (E, K, J, R, S, T) / ± 100 mVDC
Connector	Removable
Connection type	Screw terminal
Terminal wire size	14 – 22 AWG
Test point	All connections
Module size	1 controller bay

Bus power required (5 VDC)	0.26 mA
Isolation rating	500 VDC
Operating temperature	
Horizontal installation ¹	0 – 50°C
Vertical installation ¹	0 – 45°C
Storage temperature	-25 – 85°C
Humidity	5 – 95% non-condensing
5100 equivalent part number	I

1. Refer to the applicable controller datasheet for proper mounting instructions.

Performance specifications

Parameter	Value
Input range	Thermocouple (E, K, J, R, S, T) / ± 100 mVDC
Input resolution	16-bit
Input resistance	
+Ain to –Ain	$10^{12} \Omega$
+Ain to ACOM	$10^{12} \Omega$
–Ain to ACOM	1.5 M Ω
Max input voltage	± 40 VDC
Full range calibration error ^{1,2}	0.013% $\pm 1^\circ\text{C}$
Offset calibration error at 0 V ^{1,2}	0.013% $\pm 1^\circ\text{C}$

Parameter	Value
Linearity error (full range) ^{1,2}	0.037% $\pm 2^\circ\text{C}$
Digital input filter size (settable)	1 – 255 samples
Digital input filter rate	5 msec

1. Errors are at 25°C.

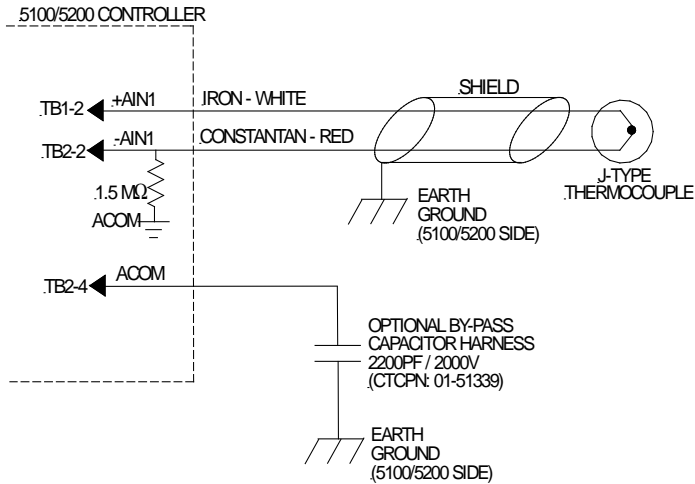
2. Errors are double across full ambient temperature range of 0 – 50°C.

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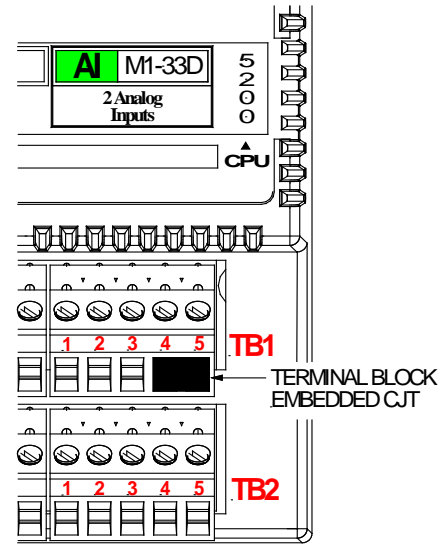
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Typical Application



Connections



Thermocouple Specifications

TYPE	+ AIN		- AIN		RANGE (°C)	
E	WHITE	CHROMEL	RED	CONSTANTAN	-250	980
J	WHITE	IRON	RED	CONSTANTAN	-190	1180
K	YELLOW	CHROMEL	RED	ALUMEL	-200	1360
R	BLACK	PLATINUM ^(13%) RHODIUM	RED	PLATINUM	-40	1740
S	BLACK	PLATINUM ^(10%) RHODIUM	RED	PLATINUM	-40	1750
T	BLUE	COPPER	RED	CONSTANTAN	-180	390

I/O Terminations

TB1-1	VS_OUT
TB1-2	+Ain #1
TB1-3	+Ain #2
TB1-4	Internal CJT device
TB1-5	Internal CJT device
TB2-1	VS_RTN
TB2-2	-Ain #1
TB2-3	-Ain #2
TB2-4	ACOM
TB2-5	N/C

	5100	5200
Minimum hardware revision	A	A
Minimum firmware revision	1.01	1.01
Minimum operating system revision	4.04.12	5.06
Document number: 950-513308-0003		

Notes

- Shield grounds must be terminated on the controller side of the cable.
- For register and programming information, refer to the appropriate controller Applications Guide.
- The information and illustrations contained herein are the property of Control Technology Corporation and are subject to change without notice. Data based on VS = 24VDC @ 25°C unless otherwise noted. For additional information and/or updates visit www.ctc-control.com.
- For other thermocouple types, please contact Control Technology Corp.
- VS refers to the voltage supply of the controller. CJT refers to cold junction thermistor.