

Low Level Analog Input Multiplexer Processor - 32 Inputs

MU-PLAM02

Data Conversion Performance (General Specifications)	
Parameter	Specification
FTA Models	MU-TAMR03, TAMT03, TAMT13
Input Type	Thermocouple, RTD, and linear millivolts
Input Channels	32 galvanically isolated
A/D Converter Resolution	14 bits TC types J, K, E, T, B, S, R, RP: 10 μ V per bit 100 Ω and 120 Ω RTDs: 64 m Ω per bit 10 Ω RTD: 8 m Ω per bit Linear mV sensors: 20 μ V per bit
CMV, dc to 60 Hz	250 Vac Peak or $\pm$ 250 Vdc
Dielectric Strength	1500 Vac rms or $\pm$ 1500 Vdc channel-to-channel (operating), and channel-to-PM/APM/HPM common (not operating)
Crosstalk, dc to 60 Hz	120 dB
Input Impedance	2 M Ω min. @ 100 mV
Maximum Normal Mode Continuous Input (No damage)	-1 V to 10 V
Input Scan Rate	32 samples per second (each channel once per second)
Line Frequency Synchronization	Configurable to 50 or 60 Hz
Hardware (only) Accuracy	$\pm$ 40 μ V, or $\pm$ 160 m Ω 23.5° $\pm$ 2°C
Software (only) Accuracy ⁽¹⁾	$\pm$ 0.1°C typical, $\pm$ 0.5°C maximum at 23.5° $\pm$ 2°C
Surge withstand capability (common mode)	ANSI/IEEE C37.90.1-1978
(1) Software EU conversion error including software reference junction compensation, at reference temperature. The temperature conversion by software meets or exceeds the accuracy tolerances for fifth order polynomials as specified in the National Institute of Standards and Technology (NIST) Monograph 125 (IPTS-68).	
NOTE: Mercury-Wetted Relays are used in this product.	

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Low Level Analog Input Multiplexer Processor - 32 Inputs (continued)

MU-PLAM02

Data Conversion Performance --Thermocouple (TC) and Voltage Input			
Parameter	Specification		
Thermocouple Device Range	Normal Signal Range		Extended Signal Range
ANSI J	-100 to	750° C	-200 to 1200° C
ANSI K	0 to	1100° C	-200 to 1370° C
ANSI E	-150 to	500° C	-200 to 1000° C
ANSI T	-200 to	300° C	-230 to 400° C
ANSI B	+600 to	1650° C	+100 to 1820° C
ANSI S	+550 to	1500° C	0 to 1700° C
ANSI R	+550 to	1500° C	0 to 1700° C
JAPAN Type R	+550 to	1500° C	0 to 1700° C
Voltage Input Signal Range	0 to 100 mV		
CMRR, dc to 60 Hz (0-100 mV)	120 dB min. with 500Ω lead imbalance		
NMRR, at line frequency (50 or 60 Hz)	60 dB min.		
NMRR, at other than line frequency (1-15 mV)	NMRR = $-20 \times \log_{10} \left(\frac{\sin(\pi^x f^x t)}{(\pi^x f^x t)} \right) - 20 \times \log_{10} \left(\frac{1}{K^x f} \right)$ Where: π= 3.14159 f= Noise Frequency t= Integration Time (20 ms @ 50 Hz, 16.66ms @ 60 Hz) K= 0.20878 (a constant)		
Normal Mode Filter Response (TC & mV)	-3 dB point: Typical 5.1 Hz; min. 4.3 Hz; max. 6.4 Hz		
Hardware Reference Junction Accuracy	±1.0°C maximum at 23.5° ±2°C (in cabinet)		
Temperature Stability Voltage Input, current input, thermocouple input (except reference junction)	20 ppm/°C RSS 30 ppm/°C maximum		
TC Max Length, 250 V Peak/dc Common Mode 16 Gauge TC Wire 18 Gauge TC Wire 20 Gauge TC Wire	3,500 ft. 2,250 ft. 1,250 ft.		
CMRR = Common Mode Rejection Ratio. NMRR = Normal Mode Rejection Ratio.			

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Low Level Analog Input Multiplexer Processor - 32 Inputs (continued)

MU-PLAM02

Data Conversion Performance--Resistive Temperature Device (RTD)	
Parameter	Specification
RTD (3 Wire) Input Signal Range Pt: 100 Ω DIN (4376) Pt: 100 Ω JIS (C-1604) Ni: 120 Ω Ed #7 Cu: 10 Ω	-200 to 850°C -200 to 650°C -45 to 315°C -20 to 250°C
CMRR, dc to 60 Hz (0-100 mV)	10 Ω RTD: 120 dB min. 100 Ω RTD: 110 dB min.
NMRR, at line frequency (50 or 60 Hz)	10 Ω RTD: 60 dB min. (for 50/60 Hz noise of 0-15 mV) 100 Ω RTD: 60 dB min. (for 50/60 Hz noise of 0-75 mV)
NMRR, at other than line frequency 10 Ω RTD: (0-15 mV) 100 Ω RTD: (0-75 mV)	$\text{NMRR} = -20 \times \log_{10} \left(\frac{\sin(\pi \times f \times t)}{(\pi \times f \times t)} \right) \text{ Where:}$ $\pi = 3.14159$ $f = \text{Noise Frequency}$ $t = \text{Integration Time (20 ms @ 50 Hz, 16.66ms @ 60 Hz)}$
Hardware Reference Junction Accuracy	$\pm 1.0^\circ\text{C}$ maximum at $23.5^\circ \pm 2^\circ\text{C}$ (in cabinet)
Temperature Stability RTD Input	30 ppm/ $^\circ\text{C}$ RSS 40 ppm/ $^\circ\text{C}$ maximum
RTD Max Lead Resistance	15 Ω
CMRR = Common Mode Rejection Ratio. NMRR = Normal Mode Rejection Ratio.	

Remote Hardened Multiplexer Processor - 32 Inputs

MU-PRHM01

Data Conversion Performance (General Specifications)	
Parameter	Specification
FTA Model	MC-GRMT01
Input Type	Thermocouple and linear millivolts
Input Channels	32 galvanically isolated (16 per remote FTA)
A/D Converter resolution	15 bits 100 mV range: LSB = 8 μ V Type J, K, or E thermocouples: LSB = 8 μ V Type T, B, S, R, or R' thermocouples: LSB = 2 μ V
Common Mode Voltage, dc to 60 Hz	$\pm$ 30 VRMS Continuous (max, no damage) $\pm$ 200 V Intermittent (max, no damage)
Crosstalk, dc to 60 Hz	120 dB min
Input Impedance	10 Megohms Min
Maximum Normal Mode Continuous Input (no damage)	$\pm$ 30 VRMS Continuous, one channel at a time
Input Scan Rate	Each channel once per 4 seconds
Line Frequency Noise Cancellation	Configurable to 50 or 60 Hz
Hardware (only) accuracy	0.075% of Full Scale (mV or T/C range)
Software (only) accuracy ⁽¹⁾	0.1°C typical, 0.5°C maximum at 20°C
Surge withstand capability	ANSI/IEEE C37.90.1-1978
Data Conversion Performance (Thermocouple and Voltage Input)	
Parameter	Specification
Thermocouple Device Range	
ANSI J	-200 to + 1200°C
ANSI K	-100 to + 1370°C
ANSI E	-200 to + 1000°C
ANSI T	-230 to + 400°C
ANSI B	+100 to + 1820°C
ANSI S	0 to + 1700°C
ANSI R	0 to + 1700°C
Japan Type R	0 to + 1700°C

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