## 6.6. 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<br>TC types J, K, E, T, B, S, R, RP: 10 µV per bit<br>100 □ and 120 □ RTDs: 64 m□ per bit<br>10 □ RTD: 8 m□ per bit<br>Linear mV sensors: 20 µV per bit |
| CMV, dc to 60 Hz | 250 Vac Peak or ±250 Vdc |
| Dielectric Strength | 1500 Vac rms or ±1500 Vdc channel-to-channel (operating), and channel-to-PM/APM/HPM/EHPM common (not operating) |
| Crosstalk, dc to 60 Hz | 120 dB |
| Input Impedance | 2 M□ 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 | ±40 µV, or ± 160 m □<br>23.5□ ±2□C |
| Software (only) Accuracy(1) | ±0.1□C typical, ±0.5□C maximum at 23.5□ ±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 500 □ lead imbalance | | | |
| NMRR, at line frequency (50 or 60 Hz) | 60 dB min. | | | |
| NMRR, at other than line frequency (1-15 mV) | NMRR = $-20 \cdot \log_{10}\left(\frac{\sin(\pi^x f^x t)}{(\pi^x f^x t)}\right) - 20 \cdot \log_{10}\left(\frac{1}{K^x f}\right)$<br>Where:<br>□= 3.14159<br>f= Noise Frequency<br>t= Integration Time (20 ms @ 50 Hz, 16.66ms @ 60 Hz)<br>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<br>Voltage Input, current input, thermocouple input (except reference junction) | <br>20 ppm/□C RSS<br>30 ppm/□C maximum | | | |
| TC Max Length, 250 V Peak/dc Common Mode<br>16 Gauge TC Wire<br>18 Gauge TC Wire<br>20 Gauge TC Wire | <br>3,500 ft.<br>2,250 ft.<br>1,250 ft. | | | |
| CMRR = Common Mode Rejection Ratio.<br>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<br><br>Pt: 100 □ DIN (4376)<br>Pt: 100 □ JIS (C-1604)<br>Ni: 120 □ Ed #7<br>Cu: 10 □ | <br><br>-200 to 850°C<br>-200 to 650°C<br>-45 to 315°C<br>-20 to 250°C |
| CMRR, dc to 60 Hz (0-100 mV) | 10□ RTD: 120 dB min.<br>100□ RTD: 110 dB min. |
| NMRR, at line frequency (50 or 60 Hz) | 10□ RTD: 60 dB min. (for 50/60 Hz noise of 0-15 mV)<br>100□ RTD: 60 dB min. (for 50/60 Hz noise of 0-75 mV) |
| NMRR, at other than line frequency<br>10□ RTD: (0-15 mV)<br>100□ RTD: (0-75 mV) | NMRR = -20 □$\log_{10}\left(\frac{\sin(\pi^{x} f^{x} t)}{(\pi^{x} f^{x} t)}\right)$ Where:<br>□= 3.14159<br>f= Noise Frequency<br>t= Integration Time (20 ms @ 50 Hz, 16.66ms @ 60 Hz) |
| Hardware Reference Junction Accuracy | ±1.0□C maximum at 23.5□ ±2□C (in cabinet) |
| Temperature Stability<br>RTD Input | <br>30 ppm/□C RSS<br>40 ppm/□C maximum |
| RTD Max Lead Resistance | 15 □ |
| CMRR = Common Mode Rejection Ratio.<br>NMRR = Normal Mode Rejection Ratio. | |