

### High-Speed 14-Channel RTD Signal Conditioning Module w/Precision Multiplexed Current Excitation and Programmable Digital Moving-Average Filtering



#### Applications

- Flight test instrumentation
- Factory automation and process control
- Research measurements and experiments

#### Features

- 14-channel RTD conditioner module
- Precision constant current excitation per channel
- Compatible with the MEDAU/MCDAU/MWDAU-20xx and MnDAU/MnWDAU/MnACQ-2000 systems
- Both 2-wire and more accurate, 3-wire RTD measurements are supported
- No external reference resistors are required
- Continuous 2-point gain and offset error correction performed “on-the-fly” in background
- Linearized temperature output provided for most common RTD types including the American ( $\alpha = 0.00392 \Omega/\Omega/^\circ\text{C}$ ) and European ( $\alpha = 0.00385\Omega/\Omega/^\circ\text{C}$ ) curves
- Resistance mode provides output proportional to resistance
- $\pm 0.25\%$  system accuracy
- Programmable digital moving average filters provide a choice of channel filtering options
  - Choices are 1 sample (no MAV filter), 2, 4, 8, 16, 32, 64 or 128 samples
- High data update rate, 312.5 updates/sec
- Programmed with included Microsoft Windows based software

#### Description

The MRTD-114A-1 is a 14-channel, DSP-based RTD conditioning module for use in TTC’s MEDAU/MCDAU/MWDAU-20xx and MnDAU/MnWDAU/MnACQ-2000 series products. Multiplexed constant current excitation is provided to reduce sensor self-heating and total power dissipation of the system. The constant current value is software programmable to 0.512, 1.024, 2.048 and 4.096 mA. Both 2-wire and more accurate, 3-wire RTD measurements are supported for Platinum RTDs having a  $0^\circ\text{C}$  resistance of up to 1,000 Ohms. Linearized output proportional to the measured temperature is provided for most common RTD types including the American ( $\alpha = 0.00392$ ) and European ( $\alpha = 0.00385$ ) curves. Other RTD types may be used without linearization support providing an output proportional to the input resistance. The interface is configured to allow for sensor wire resistance compensation when used in the 3-wire mode. No external reference resistors are required. The MRTD-114A-1 automatically programs channel gain and offset to allow the user to “zoom-in” on a particular temperature range. The module provides continuous gain and parasitic offset error correction and offers an accuracy of  $\pm 0.25$  percent over the operating temperature range. Programmable digital moving average filters provide a choice of channel filtering options. Each channel is sampled at a fixed rate of 312.5 SPS per channel and the result is stored in a Current Value Table at 16-bit resolution. The system can sample this data at any rate.

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#### MRTD-114A-1 Datasheet

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Specifications subject to change without notice.

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