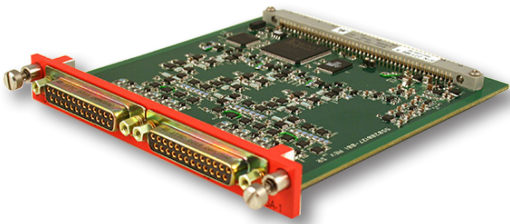


RTD-116A-1

High-Speed 16-Channel RTD Signal Conditioning Card

**CURTISS-
WRIGHT**

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Key Features

- 16-channel RTD conditioner card
- Precision constant current excitation per channel
- Compatible with the EDAU/CDAU/WDAU-20xx system
- 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

Applications

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

Precision Multiplexed Current Excitation and Programmable Digital Moving-Average Filtering

The RTD-116A is a 16-channel, DSP-based RTD conditioning card for use in Curtiss-Wright's EDAU-20xx, CDAU-20xx or WDAU-20xx 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°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 RTD-116A-1 automatically programs channel gain and offset to allow the user to “zoom-in” on a particular temperature (or resistance) range. The module provides continuous gain and parasitic offset error correction and offers an accuracy of ± 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.

Additional Features

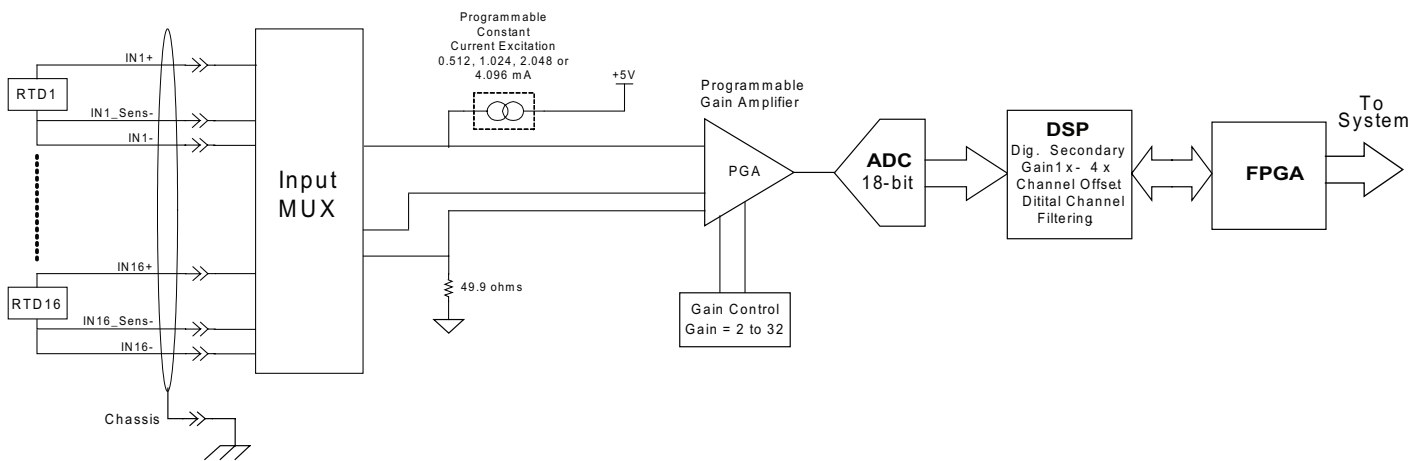
- Programmable digital moving average filters provide a choice of channel filtering options
 - + Choices are 1 sample (no MAV filter), 2, 4, 8, 16, 32, 64 or 128 samples
- High data update rate, 312.5 updates/sec
- Programmed with included Microsoft® Windows® based software

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Compatible



RTD-116A-1 block diagram

Specifications

General

- Supply current: +15V @ 45mA, +5V @ 252mA
- Power consumption: 1.93 watts max
- Operating temperature: -35 to 85°C (box ambient temp)
- Storage temperature: -55 to 100°C
- Compatibility: Operates in any EDAU/CDAU/WDAU-20XX series equipment

Dimensions and Mechanical

- Weight: 4.9 ounces (140 grams) not including the mating connectors
- Unit connectors (2 each): Canon™ DBM25SD
- Mating connectors (2 each): Canon™ DBMA25P
- Backshell (optional): Canon™ DC24659 -Various other styles available

TABLE 1 Supported RTD curve types:	
A ($\Omega/\Omega/^\circ\text{C}$)	RTD TYPES
0.003926	1. PA, PH, PJ, PK, PL
0.003926	2. PB, PP
0.003850	3. PC
0.003851	4. PD, PE, PG, PF, PN, PS (European, IEC 60751)
0.003923	5. PY
0.003750	6. PW
0.003916	7. (American, ASTM E1137)

Electrical

- Input type: 2-Wire or 3-Wire RTD
- Channels per card: 16
- RTD resistance range: 0Ω to 4kΩ
- RTD input voltage: Not to exceed 2.0 volts at maximum RTD resistance
- Analog gain: 2x to 32x. Automatically selected by setup software on a per channel basis
- Digital gain and offset: User enters zero and full-scale temperature or resistance values. The output is then scaled to provide 0 to 65535 counts (when set for 16-bit resolution) within the requested temperature or resistance range.
- Data linearization (Linearized temperature mode only): The temperature data from the RTD-116A-1 card is electronically linearized prior to placement in the PCM output format
- System overall accuracy: $\pm 0.25\%$ of selected RTD upper limit temperature over the operating temp range
- Moving average filter options: Software programmable for 1 sample (no filtering), 2, 4, 8, 16, 32, 64 or 128 samples)
- Channel status indicators: Open sensor/excessive resistance
- Channel data update rate: 312.5 updates per second
- Output data resolution: 16-bits
- Channel sample restrictions: None
- Common mode voltage range: 0 to +2 volts maximum
- Crosstalk: < -60 dB from DC to 1kHz
- Excitation type: Precision multiplexed constant current, duty cycle = 11.1%
- Excitation levels: Programmable on a per channel basis for 0.512, 1.024, 2.048 or 4.096 mA
- Calibration assertion: Automatic. Dynamically carried out in background, transparent to user. May be disabled.
- Calibration reference: On-board, ultra-precision bulk foil resistors: 50Ω, 100Ω, 200Ω, 400Ω, 800Ω and 1600Ω.
- Calibration operation: A two-point calibration dynamically calculates gain and parasitic offset errors in each channel and implements required mathematical corrections. Each channel's correction values are re-calculated and updated over a 2.5 sec. period using the analog gain and excitation current settings at which the channel is operating.

Ordering Information

Contact [Curtiss-Wright](#) for ordering information