

RTD Sensor Board

Features

- Simulate 2-, 3-, and 4-wire Resistance Temperature Devices (RTDs)
- Controlled via IEEE-1394 serial interface
- Eight channels per board

Description

The RTD Board is controlled via an IEEE-1394 serial interface. It is used in ADI's Distributed I/O System (DIOS). The RTD board is a complete I/O device which simulates an RTD which is driven by an external constant current source.

The control of this board uses an IEEE-1394 serial link to communicate with model software running in an ADI real-time system (rtX or RTS).

Examples of sensors that are readily and accurately simulated with this board are 2-, 3-, and 4-wire Resistance Temperature Devices (RTDs). The RTD board is a standard DIOS board size, 6U by 280 mm.

Each of the eight RTD circuits is optically isolated from every other resistor circuit as well as from the IEEE 1394 interface. The IEEE 1394 interface receives data and control packets from the ADI real-time system (rtX or RTS) and drives the RTD circuit to produce the desired output.

The RTD circuit includes a voltage-controlled current source driven by a DAC. The excitation current is monitored by an ADC. The embedded PowerPC-based microprocessor reads the ADC and adjusts the DAC as necessary to allow the circuit to modify its operating point in direct proportion to the excitation current just like a physical resistor. The RTD circuit covers a range from 30 to 1024 Ohms.

The IEEE 1394 cable plugs into the RBT/RTD board at the front panel. I/O signals connect to the board at the rear panel connectors provided by the DIOS chassis. Standard connectors are 0.050 series 96-pin D-shell connectors, but other connectors can be accommodated with a custom cable interface board.

Specifications

IEEE-1394 Interface

- IEEE 1394a-2000 Compliant
- 100/200/400 Mb/s
- OHCI Compliant

Embedded Processor

- PowerPC-based
- On-chip PCI & Local Bus Interfaces
- 4MB On-board Flash Memory
- 8MB On-board SDRAM

Variable Resistor Circuit

- 8 channels
- Each channel optically isolated and independently powered
- Emulates 2-, 3-, or 4-wire resistive sensor
- Pins provided for Kelvin 3- or 4-wire connection
- Excitation current: 5/10 mA nominal
- Simulated resistance range: 30 - 1024 Ohms
- Resolution: 16 bits
- Accuracy (calibrated): ± 0.5 Ohms max
- Temperature drift: ± 0.01 Ohms/ $^{\circ}$ C max