



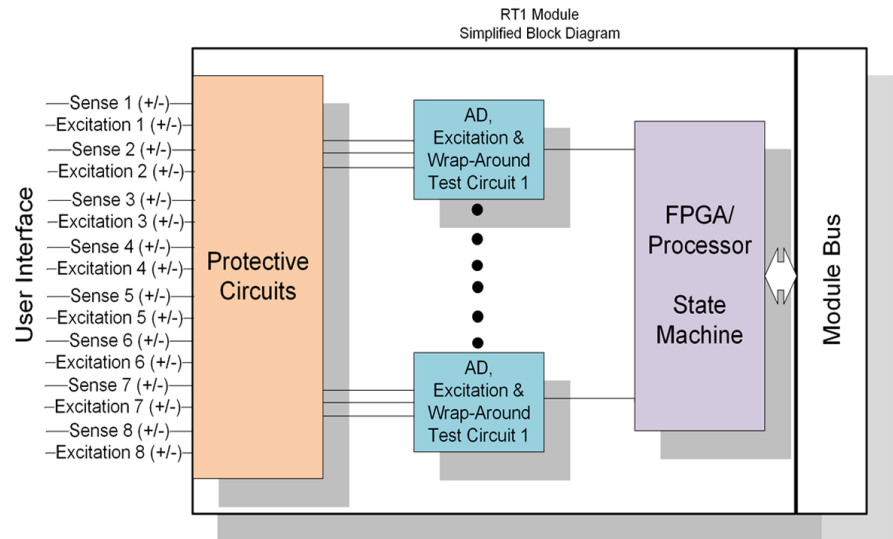
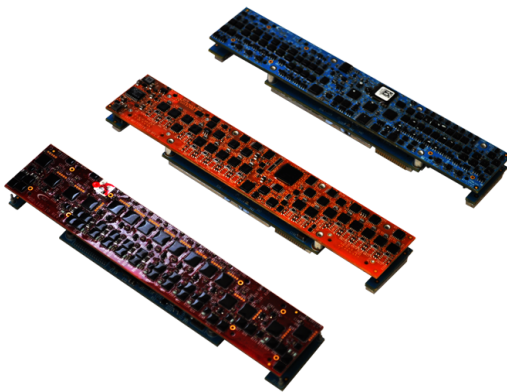
# RT1 Measurement & Simulation Modules Thermocouple and RTD Measurement Function Modules

## 8 Channels, RTD Measurement

The module provides 8 measurement channels, and can be programmed for interfacing to 2, 3, and 4-wire platinum RTD sensor configurations. The 4-wire mode is the most accurate, providing excellent stability and repeatability. The RTD channels feature individual A/D converters and precision excitation/current drive. Programmable lead-wire compensation is provided for inherently less accurate 2 and 3-wire configurations. All RTD channels are self-aligning because each channel is automatically "aligned" on a rotating basis to eliminate offset and gain errors throughout the operating envelope. Programmability for expected resistance range and wire modes allows for optimization of scaling/resolution, as well as flexibility in reading many RTD types.

The RT1 is used to measure temperature by providing the measured resistance of the RTD element. By correlating the characteristic resistance with the temperature algorithm of the specific RTD utilized, the temperature can be resolved. Most RTD elements consist of a length of fine coiled wire wrapped around a ceramic or glass core. The element is usually quite fragile, so it is often placed inside a sheathed probe to protect it. The RTD element is made from a pure material, typically platinum, nickel, or copper. The material has a predictable change in resistance as the temperature changes; it is this predictable change that is used to determine temperature.

Due to higher accuracy and repeatability, RTDs are increasing in use as compared with thermocouples in many industrial/embedded and test applications below 600° C.



### Features

- **RTD Measurement**
  - Higher accuracy and repeatability as compared with thermocouples in applications below 600 °C
  - Two, three or four-wire mode
  - Channels are calibrated at the factory for Pt100, Pt500, Pt1000 and Pt2000 RTDs
  - Single Precision Floating Point Value (IEEE-754) format
  - Open sensor connections are detected and reported
  - 1 mA, 500 µA, 250 µA & 100 µA excitation sources for Pt100, Pt500, Pt1000 and Pt2000 ranges
- **Independently Programmable**
  - Up to 8 RTD channels
- **Programmable Sample Rate**
  - Sets the sampling rate of the A/D
- **Offset Temperature**
  - Provides ability to null for any system induced measurement errors

**Specifications**

Number of Channels	8 Channels
Analog Input Resolution	24-bits per channel
RTD Interface	4, 3, or 2-wire RTD interface capability. Specifically designed for use with 100Ω, 500Ω, 1000Ω and 2000Ω RTDs, or any RTD whose maximum operating resistance is less than 8000Ω.
Open Line Detection	Ability to detect an open in any line or RTD in all wire modes.
Excitation	1mA (Pt100), 500μA (Pt500), 250μA (Pt1000) or 100μA (Pt2000) for 2- & 4-wire mode; 500μA (Pt100), 250μA (Pt500), 125μA (P1000) or 50μA (Pt2000) for 3-wire mode
Accuracy	±0.1% of full-scale value @ 5 samples per second (4-wire mode only), ±0.2% of full-scale value @ 5 samples per second (3-wire mode only), ±1.2% of full-scale value @ 5 samples per second (2-wire mode only)
Sample Rate	Programmable between 3 - 4800 Hz
Output Format	Resistance/Temperature
ESD Protection	Designed to meet the testing requirements of IEC 801-2 Level 2. (4 KV transient with a peak current of 7.5 A and a Tc of approximately 60 ns.)
Power	5 VDC @ 450 mA typical
Ground	All channel grounds are common and are isolated from system ground.
Weight	1.5 oz. (42 g)

**Architected for Versatility**

NAI's Configurable Open Systems Architecture™ (COSA®) offers a choice of over 100 smart I/O, communications, or Ethernet switch functions, providing the highest packaging density and greatest flexibility of ruggedized embedded product solutions in the industry. Preexisting, fully-tested functions can be combined in an unlimited number of ways quickly and easily.

**One-Source Efficiencies**

Eliminate man-months of integration with a configured, field-proven system from NAI. Specification to deployment is a seamless experience as all design, state-of-the-art manufacturing, assembly and test are performed - by one trusted source. All facilities are located within the U.S. and optimized for high-mix/low volume production runs and extended lifecycle support.

**Product Lifecycle Management**

From design to production and beyond, NAI's product lifecycle management strategy ensures the long-term availability of COTS products through configuration management, technology refresh and obsolescence component purchase and storage.

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