Radiy delivers a digital I&C platform that is robust, flexible, and scalable. It provides state-of-the-art functions, services, and safeguards for both safety and safety-related applications in the nuclear industry. The RadICS product line consists of a Logic Module, basic input/output modules, and specialty modules all housed in a seismically qualified chassis.

The RTD Inputs Module (RIM) will serve as a highdensity analog RTD sensor acquisition module. It will provide 8 independent, highly reliable, and galvanically isolated inputs with built-in filtering and calibration for use by the Logic Module. The RIM will also perform robust and continuous self-diagnostics to ensure the safety and integrity of each input and module function.

Resistance Temperature Detector Inputs Module (RIM)

- High density 8 channel analog inputs with built-in hardware redundancy and self-diagnostics for highly reliable operation, filtering, calibration, and random hardware failure detection.
- Independent FPGA for analog input processing, self-diagnostics, and fail-safe functional behavior.
- Robust self-diagnostics ensure higher reliability and early fault detection with safety-focused fault management.
- Segregation of input processing, self-diagnostics, and watchdog functions assure safety-critical functionality.
- Galvanic isolation for signal inputs with robust and dedicated communication links to Logic Module for secure data transfer.
- Inherent on-board diversity features eliminate common cause failure vulnerabilities.
- FPGA technology ensures resilience to I&C obsolescence.

20 Years of Proven Innovation for the Global Nuclear Industry

Resistance Temperature Detector Inputs Module Technical Specifications

Input Analog Signal Range	5-1500 Ohms (0-1600 Ohms over-range monitoring capabilities) 4 signal sub-ranges: 5-198 Ohms; 5-398 Ohms; 5-795 Ohms; 5-1500 Ohms.
Supported Sensor Types	**1.** 2-, 3- and 4-wire connection schemes support. **2.** Raw resistance (Ohms) measurement (to support any specific sensor type with external conversion into temperature performed in Logic Module). **3.** 5 pre-defined RTD sensor types support with adjustable R0 (up to 350 Ohms) and R -> t conversion performed internally by module. Supported RTD types: - Platinum (α=0.00385 per °C) – corresponds to IEC 751 - Platinum (α=0.00391 per °C) - Copper (α=0.00428 per °C) - Copper (α=0.00426 per °C) - Nickel (α=0.00617 per °C)
A/D Conversion Resolution	18 bits / 400 kilo samples per second (kSPS)
Response Time	100 milliseconds
Common Mode Rejection Ratio	> 86 dB
Overall Accuracy	0.1% of sub-range full scale (@ 25 °C)
Input Channel Isolation	all input channels are galvanic-isolated up to 250 V_{RMS} AC or 250 VDC field-to-Chassis and channel-to-channel
Overvoltage Protection	±60 VAC/VDC continuous (using external protection elements installed in Chassis)
Information Package Exchange Cycle	5 milliseconds
Diagnostic Package Exchange Cycle	5 milliseconds
LVDS Line Speed	100 megabit/second
LVDS Line Protocol	proprietary protocol with integrity checking (CRC), galvanic-isolated Tx / Rx
Self-Diagnostic Functions	diverse watchdog unit, checksum analysis, active diagnostics with internal fault detection, hardware error detection, functionally diverse continuous self-diagnostic tests, power supply fault detection
Power Supply / Consumption	2 independent inputs – 24 (18 – 36) VDC / Maximum consumption: 0.29A(±0.15A) (8 inputs used; 1500 Ohms input value at each input)
Indications	2 status LED indicators (RUN/FAULT) 4-character dot matrix symbol-indicator for providing current operational mode, service information, and error codes
Operating Temperature	4.4 to 60 °C (40 to 140 °F)
Operating Humidity	10 to 90% relative humidity, non-condensing

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For more than 20 years Radiy has provided advanced instrumentation and control (I&C) solutions for nuclear power plant modernization and new build projects in the global market. Radiy's main I&C product, the RadICS I&C Platform, was developed specifically for use in nuclear power plants. It is the only FPGA-based I&C platform with a SIL 3 certification in a single channel configuration. Radics, a wholly owned LLC, provides delivery services for the RadICS I&C Platform for international markets to meet local regulatory requirements. Radiy also offers industrial control systems, electrical equipment, and reverse engineering services.

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