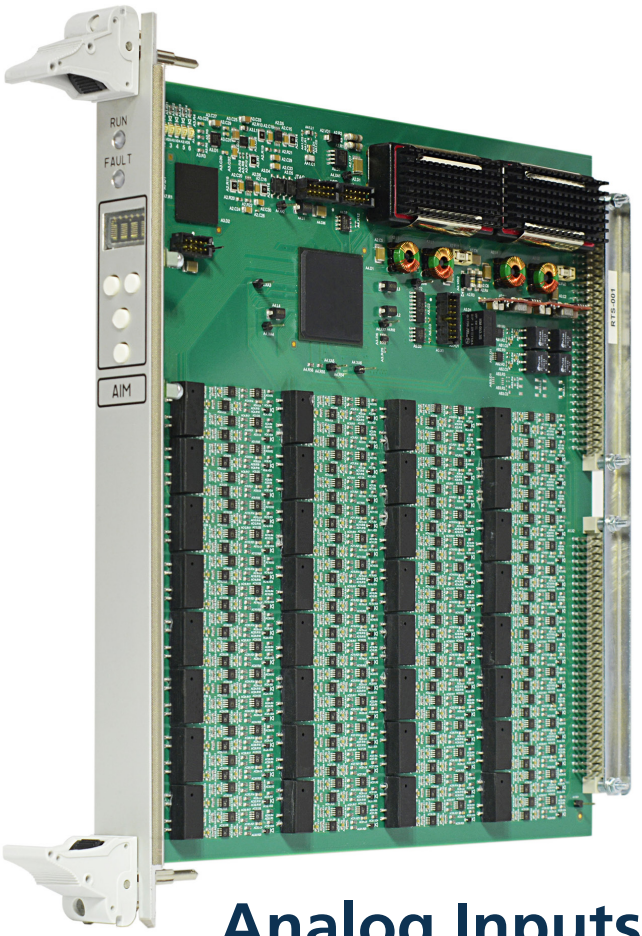

Analog Inputs Module (AIM)

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 non-safety 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 Analog Inputs Module (AIM) serves as a high-density analog field sensor acquisition module. It provides for 32 independent, highly reliable, and galvanically isolated inputs with built-in filtering and calibration to be used by the Logic Module. The AIM also performs robust and continuous self-diagnostics to ensure the safety and integrity of each input and module function.

- High density 32 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.
- IEC 61508 SIL 3 certification in single and multiple channel configurations.
- 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

Analog Inputs Module Technical Specifications

Input Analog Signal Range	0 to +5.1 V (0 to 20 milliamps using external 250 ohm resistor installed in connection/junction box) Differential input impedance: not less than 1 megohm
A/D Conversion Resolution	18 bits / 400 kilo samples per second (kSPS)
Common Mode Rejection Ratio	> 86 dB
Overall Accuracy	0.04% of full scale for 0 to +5.1 V (at 25 °C) 0.04% of full scale for 4 to 20 milliamps using external resistor with 0.05% tolerance (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: 0.85A(±0.15A) (32 inputs used; 5V 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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