



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 Analog Inputs for (Neutron) Flux Measurement Module is designed to receive and process pulse and ultra-low current signals from any kind of neutron detector for use by the Logic Module. The AIFM has three isolated input units that can receive a signal from a neutron flux detector and perform signal processing in pulse, fluctuation, and current modes. The AIFM also performs robust and continuous self-diagnostics to ensure the safety and integrity of each input and module function.



Analog Inputs for (Neutron) Flux Measurement (AIFM)

- ▶ Three high-sensitivity, independent, and galvanically isolated analog input channels (counting, Cambelling, or current mode) with built-in self-calibration, input comparisons, and voltage supervision.
- ▶ 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 output processing, self-diagnostics, and watchdog functions assures 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 for (Neutron) Flux Measurement Module Technical Specifications

Input Analog Signal Range (current)	1.0 picoamps ... 10 milliamps (10 decades) Pulse signal processing up to 2×10^6 counts per second Input impedance less than 1500 ohm
Input Channel Isolation	all input channels are galvanic-isolated 1600 VAC / VDC field-to-Chassis and channel-to-channel
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: 0.8A(\pm 0.15A) (3 inputs used; 10mA 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 Rady has provided advanced instrumentation and control (I&C) solutions for nuclear power plant modernization and new build projects in the global market. Rady'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. Rady also offers industrial control systems, electrical equipment, and reverse engineering services.