



Radics delivers digital I&C Platform RadICS that is robust, flexible, and scalable. The Company 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 specialized modules, all housed in a seismically qualified chassis.

Developing equipment for automatic neutron flux detection, Radics designed AIFM 2.0. The specialized module is made as a remote device, located near an ionization chamber.

AIFM 2.0 receives pulse and current signals from the ionization chamber, digitizes them, and transfers data to Logic Module via RS-485 for further processing. All kinds of testing signals ensure design properties and safety operation of AIFM 2.0.



Analog Input for (Neutron) Flux Measurement 2.0 (AIFM 2.0)

AIFM 2.0 is a built-in power module to supply ionization chamber with stabilized 100-750 VDC.

PRODUCT HIGHLIGHTS:

- > Power turn off via “dry contact” input signal;
- > Pulse signal counter;
- > Current signal measuring;
- > True RMS current fluctuation measuring;
- > Data transfer via RS-485 protocol;
- > Sensor power voltage control;
- > Inner units power and temperature monitoring;
- > Discrimination level of pulse signal control;
- > Pulse, current, and fluctuation testing signals, conducted on command;
- > 2-channel 24 VDC power.



Analog Input for (Neutron) Flux Measurement (AIFM 2.0)

Technical Specifications Measurement of neutron flux density in the range 1.0 to 1.0E+11 nv using signals from out-of-reactor detectors

Detector type	1. Fission chamber 2. Compensated ionization chamber 3. Neutron counter
Ionization pulse repetition frequency from the sensor (ionization chamber, counter)	5.0E-2 to 1.0E+6 Hz
The variable component of the current of the Sensor (ionization chamber) in the Campbell measurement mode	2.4E-25 to 2.4E-21 A/c ⁻¹
The constant component of the current of the ionization sensor (ionization chamber)	4.0E-8 to 4.0E-3 A
Measurement time constant	50-0.05c (automatic range change)
Output analog signal range	0-5 mA (4-20 mA), 0-5 VDC
Accuracy of current measurement channels	±0.1% (in the signal current range 0.5 mA - 0.5 mA) ±0.05% (in the signal current range 0.5 mA - 1 mA)
Frequency measurement channel accuracy	±0.05%
Input isolation	All input is galvanic-isolated 500 V AC RMS or 500 V DC field chassis and channel-to-channel
Data transfer protocol to/from LM	RS-485
Data transfer rate	115, 200 bit/sec
Information package exchange cycle	5 ms
Self-diagnostic functions	Power monitor; sensor power control; temperature monitor; data transfer control; pulse, fluctuation, and current testing signals (by operator commands from the RadICS Platform)
Power supply/consumption	2 independent inputs - 24 (18 - 36) VDC / Maximum consumption: 1 A
Output voltage for non-reactor sensor (from built-in source) at current up to 1.0mA	1. from 0 to +800 VDC 2. from 0 to -400 VDC
Dimensions WxHxD	220x55x255 mm (8.6x2.2x10.0 inch)
Weight	3.5 kg (7.7 pound)
Operating temperature	4.4 to 60 °C (40 to 140 °F)
Operating humidity	10 to 90% relative humidity, noncondensing
Input cable length from the neutron detector	Up to 25 m
RS-485 output cable length to LM module	Up to 250 m
Enclosure protection version	IP67
Connector type	Bayonet
Power calculation function (formation of a "wide range" of measurement)	External (in LM RadICS module)
Function for calculating the acceleration period (the rate of change in the neutron flux density) and reactivity	External (in LM RadICS module)
Formation of protection signals by the period of acceleration and power	External (in LM and RadICS Platform)
Formation of signaling signals for control room and archiving	External (in LM and RadICS Platform)

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RadICS Platform is the only FPGA-based I&C platform with a SIL 3 certification in a single channel configuration. The Platform is reviewed and approved by U.S. NRC. Radics LLC provides engineering, testing and commercial grade dedication services for nuclear power clients on international markets to meet local nuclear regulatory requirements and ensure safety and reliability at nuclear power generation sites.