



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 Outputs Module (AOM) serves as a high-density output conditioning module providing for 32 independent, highly reliable, and galvanically isolated analog outputs. The Logic Module uses the AOM to drive field devices, indicators, and other functions. The AOM also performs robust and continuous self-diagnostics to ensure the safety and integrity of each output and module function. In the event of critical failures, the AOM de-energizes to a safe-state.



Analog Outputs Module (AOM)

- High density 32 channel analog outputs designed to detect conditioned output signals that exceed accuracy and response time diagnostic tolerances.
- Independent FPGA for analog output 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 outputs 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.



Analog Outputs Module Technical Specifications

| | |
|---|---|
| Output Range | 0 to +5 V / 4 to 20 milliamp / ± 10 V / 0 to 5 milliamps |
| D/A Conversion Resolution | 16 bits |
| Output Signal Value Accuracy | 0.04% of full scale (at 25 °C) |
| Maximum Output Load | up to 1.2 kilo ohm (k Ω) for current output Minimum of 1 k Ω for voltage output |
| Internal Power Supply On Each Output Channel | ± 15 V / ± 35 milliamp |
| Output Analog Channel Isolation | all output 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) |
| Output Signal Update 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: 1.42A(± 0.15 A) (32 outputs in 4-20mA mode used; 20mA at each output) |
| 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 |

Research & Production
Corporation Radiy
29 Akademika Tamma Street,
Kropyvnytskyi 25009, Ukraine
inter.project@radiy.com
www.radiy.com

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.