

Discrete Input Module (DIM)

Fully Qualified Safety-Related Digital Platform

**CURTISS-
WRIGHT**



About

Curtiss-Wright Nuclear has partnered with Radics, LLC to supply integrated FPGA-based instrumentation and control (I&C) systems for nuclear power plants and research reactors. RadICS is a digital I&C platform that is robust, flexible, and scalable. It provides state-of-the-art functions, services, and safeguards for 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 Discrete Input Module (DIM) serves as a high-density discrete dry contact module providing 32 independent, highly reliable, and optically isolated inputs for use by the Logic Module. The DIM also performs robust and continuous self-diagnostics to ensure the safety and integrity of each input and module function.

Discrete Input Module (DIM)

- High density 32 channel discrete dry-contact inputs with built-in hardware redundancy and line integrity checks for hardware failure detection.
- Independent FPGA for discrete 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 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 cyber security and resilience to obsolescence.



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Discrete Input Module Technical Specifications

Function	Specifications
Internal Power Supply For Each Independent Discrete Input	24 VDC / 10 milliamps maximum (Form A “dry” contacts)
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
Input Channel Isolation Method	optic relay
Overvoltage Protection	150 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: 0.77A (±0.15A) (32 inputs used; all inputs closed)
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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