Optical Communications Module (OCM)

Fully Qualified Safety-Related Digital Platform

CURTISS-WRIGHT

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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 Optical Communication Module (OCM) receives and transmits data via up to five independent safety qualified point to point fiber optic interfaces that are used to extend the RadICS Platform to additional chassis (OCM to OCM or OCM to LM). The OCM also performs robust and continuous self-diagnostics to ensure the safety and integrity of data transfer and module function.

Optical Communications Module (OCM)

- Five independent fiber optic communication ports for full-duplex communications between channels or expansion racks.
- Five RS-232/RS-485 interfaces for one-way communication with peripheral devices.
- Independent FPGA for data communication, self-diagnostics, and fail-safe functional behavior.
- Robust self-diagnostics give early fault detection for safety-focused fault management.
- Segregation of communications processing, self-diagnostics, and watchdog functions assures safety critical functionality.
- Galvanic isolation for external communication lines 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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Optical Communications Module Technical Specifications

Function	Specifications
Fiber Optic Lines Type	optical full duplex
Fiber Optic Lines Speed	100 megabit/second
LVDS lines speed	100 megabit/second
RS-232 Interfaces Speed	up to 115,200 bauds/second
RS-485 Interfaces Speed	up to 921,600 bauds/second
RS-232/RS-485 Interfaces Protection	up to 28 VRMS (line to line) up to 120 VRMS (line to ground) power cross condition
Information Package Exchange Cycle	5 milliseconds
Diagnostic Package Exchange Cycle	5 milliseconds
Diagnostic Data Exchange Cycle	up to 5 milliseconds
Fiber Optic Line Protocol	proprietary protocol with integrity checking (CRC), galvanic-isolated Tx / Rx
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: 0.5A (±0.15A) (5 optical ports used)
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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