

Industrial-grade fiber optic ring network switches



Overview

ICP DAS's switches only choose REAL INDUSTRIAL grade switch chips that are temperature tolerant and highly reliable.

Key Takeaways

Industrial fiber optic ring switches provide high-reliability, self-healing network connectivity with millisecond-level fault recovery for harsh industrial environments. Overview of Fiber Optic Ring Networks

A fiber optic ring network is a topology where switches or nodes are connected in a closed loop using fiber optic cables, allowing data to travel in both directions. This design ensures redundancy, so if one link fails, traffic can be rerouted in the opposite direction, maintaining network uptime. Ring topologies are widely used in industrial automation, power utilities, railway communication systems, and large campus backbones where uninterrupted communication is critical ().

Key Features of Industrial Ring Switches

- Self-Healing and Redundancy Industrial switches implement ring protection protocols such as ERPS (Ethernet Ring Protection Switching) or proprietary solutions like Cyber-Ring, enabling rapid fault detection and recovery. ERPS can restore network topology within 50 milliseconds, while Cyber-Ring networks typically recover in 20-300 milliseconds, depending on the number of switches ().



- **Dual Power Inputs and Environmental Resilience** Industrial switches often feature dual redundant power inputs (e.g., 10–40V wide voltage range) and hot-swappable modules to prevent downtime from power failures. They are designed for harsh conditions, including wide temperature ranges (-40°C to 85°C), vibration resistance, EMI immunity, and IP40+ protection ().
- **Protocol Support and Network Management** These switches support industrial protocols like PROFINET, Modbus TCP, and standard Ethernet features such as VLAN, QoS, rate limiting, and security. Self-healing ring capability ensures continuous operation even during fiber cuts or switch failures ().
- **Fiber and SFP Module Flexibility** Industrial switches support fiber optic SFP modules for scalable deployment and can integrate with armored or rodent-proof cables for mechanical protection in industrial environments ().

Practical Considerations

- **Topology Design:** Proper ring design avoids broadcast storms and ensures efficient failover. Each node connects to two others, forming a loop.
- **Recovery Time:** Faster recovery is critical for real-time systems like SCADA, smart grids, and railway signaling.
- **Scalability:** New devices can be added to the ring without disrupting existing operations.
- **Deployment:** Use armored fiber cables in factories, mines, or oil fields to protect against mechanical damage and environmental hazards ().

Conclusion

Industrial ring network fiber optic switches are engineered for high reliability, rapid fault recovery, and resilience in harsh environments. By combining redundant physical links, intelligent protocols, dual power inputs, and industrial-grade hardware, these switches form the backbone of mission-critical industrial networks, ensuring continuous data transmission and operational safety.

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Cyber-Ring self-healing Ethernet technology is a proprietary developed by ICP DAS that can be used to help establish industrial

Fiber Optic Ring Redundancy Design for Industrial Ethernet Switches

The workshop deploys two independent fiber optic ring networks (Ring A and Ring B), each containing eight USR-ISG-8G industrial

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ICP DAS's switches only choose REAL INDUSTRIAL grade switch chips that are temperature tolerant and highly reliable. They are

Differences Between Industrial Ethernet Fiber Optic Backbone, Ring,

All N-TRON switches offer dual power supply inputs to eliminate the possibility of a single power supply failure bringing

Industrial Network Switches | Industrial Ethernet Switches

What are Industrial Switches? Industrial fiber switches are the intermediate devices that enable the conversion between Ethernet

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Full-Gigabit Industrial Ethernet Switches with 10G Uplink Designed to accommodate diverse networking needs, the switches offer a

Fiber Optic Ring Redundancy Design for Industrial Ethernet Switches

5. Redundancy Design as the "Lifeline" of Industrial Networks Fiber optic ring redundancy design represents not just a technical

Industrial Ethernet Switches | Phoenix Contact

Our Industrial Ethernet Switch portfolio comprises Managed and Unmanaged Switches with Gigabit, PoE, IEC 61850 certification,

Multi-Drop Ethernet Fiber Optic Switch

The TC3720 10/100M 6-Port Self-Healing Ring Ethernet Switch is a low cost solution for linking multiple RTUs & PLCs in industrial

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Using Ethernet a single fiber optic cable can carry multiple protocols. Furthermore, manufacturers are exporting their legacy

Real-time Redundant Ring Switch Industrial Ethernet Switch

Real-time Redundant Ring Switch Cyber-Ring Ethernet Self-healing Technology ernet with high reliability and fault-tolerant capability.

8-Port Managed Ethernet Switch / Redundant-Ring Fiber Optic

The MSW-1208 is a rugged, fan-less, industrial-grade, managed 10/100M Ethernet switch (layer 2) to fiber optic media converter that

Industrial Media Converter

ORing's industrial media converters seamlessly interconnect Ethernet and fiber optic networks, delivering long-distance, interference

Industrial Fiber Optic Switches

Know everything about hardened network switches also known as industrial grade hardened managed switch or hardened Ethernet

Industrial Ethernet Switches

Modernize your operations with Cisco Industrial Ethernet switches: Increase productivity, boost security, and empower industrial AI.

Industrial Ethernet Switches | Industrial Network Switch | Perle

Rugged Industrial Ethernet Switches with PoE, 5–10 ports, 10/100/1000Base-T and fiber support. Built to withstand -40°C to 75°C,

Fiber Optic Ring Redundancy Design for Industrial Ethernet Switches

The fiber optic ring redundancy design for industrial Ethernet switches is precisely engineered to address this pain point—achieving

Ethernet Switches

Moxa provides a wide range of industrial Ethernet switches that feature industrial-grade reliability, network redundancy, strengthened

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