

PLC and Industrial-Grade Switches



Overview

Managed switch selection guide for industrial PLC applications. Compare consumer vs industrial switches with specific product recommendations.

Key Takeaways

PLCs control industrial processes while industrial-grade switches ensure reliable, high-speed network communication between devices, enabling efficient and secure automation systems.

Overview of PLC

PLCs and Industrial Switches Programmable Logic Controllers (PLCs) are specialized hardware devices designed for automation control. They execute pre-programmed logic to manage machinery, sensors, and actuators, forming the backbone of industrial control systems.

PL

PLCs operate at the control layer, ensuring precise and real-time operation of industrial processes. Industrial-grade switches are network devices built to withstand harsh industrial environments. They provide stable and high-speed data transmission, connecting PLCs, sensors, HMIs, and other devices across the network.



These switches often feature anti-interference, dustproof, waterproof, and temperature-resistant designs to maintain reliable communication in challenging conditions. Advantages of Using Industrial Switches with PLCs

Real-time Data Exchange: Industrial switches support high-speed communication protocols, allowing PLCs to receive and transmit data promptly for real-time monitoring and control.

Network Reliability: Features like surge protection, ESD protection, and redundant power inputs ensure continuous operation even under unstable power conditions.

Distributed Control: Multiple PLCs can be connected via industrial switches to implement distributed control systems, improving collaboration and flexibility across production lines.

Network Segmentation and Qo

S: Managed switches allow segmentation, priority management, and VLAN support, optimizing network performance and ensuring critical data from PLCs is prioritized.

Scalability: Industrial switches, such as Siemens SCALANCE X-300 to X-500 series or Cisco Industrial Ethernet switches, offer modular designs, multiple ports, and high transmission rates to support growing network demands.

Types of Industrial Switches

Unmanaged Switches: Simple plug-and-play devices for small networks, providing basic connectivity with robust industrial protection.

Lite-

Managed Switches: Offer limited configuration and monitoring capabilities, suitable for medium-sized networks requiring some control over traffic and performance.

Fully Managed Switches: Provide comprehensive network management, including VLANs, QoS, redundancy protocols, and topology mapping, ideal for large, complex industrial networks.

Layer 3 Switches: Support routing between subnets, high port density, and high-speed connections, enabling large-scale industrial network structuring.

Examples of Industrial-

Grade Switches

Siemens SCALANCE Series: Includes compact X-000 switches for machine-level networking, X-100 unmanaged switches, X-300 rackmount switches, and X-400/X-500 Layer 3 switches for high-performance networks.

Cisco Industrial Ethernet Switches: Rugged switches with PoE options, high-speed uplinks, low-jitter performance, and advanced security features for AI-ready industrial networks.

Maple Systems Switches: Offer unmanaged, lite-managed, and fully managed options with industrial-grade components, EMI/EMS immunity, and advanced network monitoring tools.

Integration in Industrial Automation

By combining PLCs with industrial-grade switches, manufacturers achieve efficient, flexible, and secure automation systems. Switches ensure that PLCs can communicate reliably with other devices, enabling real-time monitoring, distributed control, and rapid response to faults. This integration forms the foundation for smart manufacturing and industrial IoT applications, supporting both operational technology (OT) and IT convergence.

In summary, PLCs provide control logic while industrial-grade switches provide the network infrastructure, and together they enable robust, scalable, and intelligent industrial automation systems.

Article Content

Industrial Managed Switch Guide: Best Picks for PLC Use – Industrial ...

Managed switch selection guide for industrial PLC applications. Compare consumer vs industrial switches with specific product recommendations.

Application of Industrial Switches with PLC

In the field of industrial IoT, the application of industrial switches and programmable logic controllers (PLC) is the key to achieving efficient and reliable industrial automation systems.

SCALANCE

Find the perfect connection for every industrial application – from the automotive and chemical industries to the manufacturing and process industries. These solutions

Industrial Unmanaged Switches Explained: Reliability, Scale, and ...

Unmanaged switches play a critical role in OT networks. Learn how they affect reliability, scalability, troubleshooting, and cybersecurity on the plant floor.

Industrial Ethernet Switches

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

Industrial Ethernet Switches | Phoenix Contact

Our Industrial Ethernet Switch portfolio comprises Managed and Unmanaged Switches with Gigabit, PoE, IEC 61850 certification, and for DIN rail mounting.

Industrial Network Switches

Our network switches are built with industrial grade components, tested in-house, and certified for reliable operation in harsh environmental conditions by

Industrial Grade Managed and Unmanaged Switches

These switches help connect and manage devices like PLCs (Programmable Logic Controllers), sensors, cameras, and other industrial IoT (Internet of Things) devices in a factory or automation

How to Pick the Right Industrial Ethernet Switch: Managed vs.

When choosing a switch for an industrial environment, one of the most important decisions to make is whether to use a managed or unmanaged industrial Ethernet switch.

Application of Industrial Switches in Smart Factories

In the welding workshop of an auto parts factory, over 200 robots and PLC controllers form a real-time control network via industrial switches, transmitting over 100,000 control instructions and status data

Industrial Ethernet Switches | WAGO

Industrial Switches WAGO's switch portfolio provides scalable Ethernet network infrastructure with excellent electrical and mechanical performance. These

In industrial Ethernet, what are the differences between hubs, switches ...

As integral components of Ethernet, switches, routers, and hubs play crucial roles in industrial networks. Among them, industrial switches are the most widely used.

Industrial Switch: Understanding Industrial Ethernet Switch ...

An industrial Ethernet switch is a type of network switch designed to operate in harsh industrial environments. Oil rigs, railways, manufacturing plants, and similar applications require industrial

Guide to implementing Industrial Grade Switches

However, implementing industrial grade switches is a complex process that requires careful consideration and planning. With detailed analysis

Industrial Managed Switch Guide: Best Picks for PLC Use - Industrial ...

Industrial switches typically cost 10-20x more than consumer equivalents. An 8-port consumer switch costs \$30-50; the same port count in industrial grade runs \$300-800, depending on

Why Use Industrial Ethernet Switches?

In our discussions with customers utilizing this alternative, it was only implemented because they were not aware that industrial grade equipment was available. They are very open to

Industrial Grade Ethernet Switches -

Discover what industrial grade Ethernet switches are, their unique features, real-world applications, key differences from regular switches, and where to buy.

Industrial Ethernet Switches

Westermo industrial Ethernet switches are designed to deliver reliable and secure communication in harsh and demanding environments. Our industrial Ethernet switches enable the creation of cost

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

