VLAN Industrial-Grade Switch



Overview

In-Depth Analysis of VLAN Routing Configuration for Industrial This article will systematically analyze the VLAN routing configuration methods for industri.

Key Takeaways

Industrial-grade VLAN switches are robust Ethernet switches designed for harsh environments, offering VLAN support, network redundancy, PoE options, and advanced management for secure and reliable industrial networking.

Key Features

Environmental Resilience: Industrial VLAN switches are built to withstand extreme temperatures, humidity, vibration, and electrical interference. Many models support wide operating temperatures (e.g., -40°C to 85°C), IP40/IP67 protection, surge protection, and lightning resistance up to 6000V, ensuring stable operation in factories, transportation systems, and power substations (Maple Systems, Cisco, Moxa, Advantech).

VLA

N Support and Routing: VLANs (Virtual Local Area Networks) allow logical segmentation of networks to isolate traffic, enhance security, and reduce broadcast storms. Industrial switches support VLAN routing through methods such as router-on-a-stick, Layer 3 switching, or VLANIF interfaces, enabling communication between VLANs while maintaining isolation for sensitive industrial data (USR-ISG series example). Management Options: Industrial switches come in unmanaged, lite-managed, and fully managed variants.

© 2026 METRA FIBER MARKET - All rights reserved

Managed switches provide full control over VLAN configuration, QoS, STP/RSTP/MSTP, ERPS ring networks, and monitoring via Web, CLI, or SNMP interfaces. Lite-managed switches offer simplified configuration and monitoring, while unmanaged switches provide plug-and-play operation with basic traffic optimization (Maple Systems, Moxa, Advantech). Power over Ethernet (PoE): Many industrial switches include PoE/PoE+/PoE++ support, delivering power to devices such as IP cameras, sensors, and wireless access points over Ethernet cables.

Output can range from 30W to 90W per port, simplifying deployment and reducing the need for additional power infrastructure (Moxa, Advantech). Network Redundancy and Security: Industrial switches often feature dual redundant power inputs, ring network protocols, and high MTBF ratings (≥300,000 hours). Security features include microsegmentation, zero-trust access, and compliance with IEC 62443 standards, protecting critical industrial operations from cyber threats (Cisco, Moxa).

Applications

Manufacturing Plants: VLANs isolate production lines, machinery, and control systems to prevent broadcast storms and secure sensitive data. Transportation and Rail Systems: EN 50155-certified switches provide reliable connectivity for signaling, monitoring, and control systems. Energy and Utilities: IEC 61850-3 switches support substation automation and grid monitoring with high reliability.

Industrial Io

T: Managed VLAN switches enable seamless integration of sensors, PLCs, and SCADA systems for real-time monitoring and automation.

Vendor Examples

Maple Systems: Offers unmanaged, lite-managed, and fully managed industrial switches with VLAN support, dual power redundancy, and EMI/ESD protection. Cisco Industrial Ethernet: Provides modular and compact switches with PoE, 10-GE uplinks, ultra-low jitter, and advanced security for industrial AI and automation. Moxa: Features Layer 2 and Layer 3 managed switches, PoE options, EN 50155/IEC 61850-3 certifications, and support for industrial protocols like PROFINET, Modbus, and EtherNet/IP.

Advantech: Offers managed and unmanaged switches, PoE, protocol switches, and DIN-rail/rackmount options for mission-critical industrial networks. ConclusionIndustrial-grade VLAN switches are essential for secure, reliable, and high-performance networking in harsh industrial environments. They provide VLAN segmentation, PoE support, redundancy, and advanced management features to ensure uninterrupted operation, protect sensitive data, and enable scalable industrial IoT and automation deployments.

Selecting the right switch depends on environmental requirements, network complexity, PoE needs, and protocol compatibility.

© 2026 METRA FIBER MARKET - All rights reserved

Article Content

In-Depth Analysis of VLAN Routing Configuration for Industrial

This article will systematically analyze the VLAN routing configuration methods for industrial Ethernet switches from four dimensions: the basic principles of VLANs, three implementation methods for

Industrial Ethernet Switches

Built for diverse industrial applications, these switches feature all-gigabit, high-density, all-copper or mixed copper and fiber ports, PoE options, and resiliency

Industrial Network Switches

Our network switches read the source and destination of VLAN tagged data packets and delivers VLAN packets without changing or dropping them, assuring operational data in industrial fields is delivered

Industrial Ethernet Switches | Industrial Network Switch | Perle

Industrial-grade Ethernet Switches are specifically designed to connect devices in network environments that are subject to extreme operating temperatures of -40°C to 75°C, vibrations, and shocks. They

Ethernet Switches

Moxa provides a wide range of industrial Ethernet switches that feature industrial-grade reliability, network redundancy, strengthened security, easy management, and competitive price-to

Industrial Ethernet Switches | Phoenix Contact

Das Portfolio unserer Industrial Ethernet Switches umfasst Managed und Unmanaged Switches mit Gigabit, PoE, Zertifizierung nach IEC 61850 und zur Tragschienenmontage.

Types of Industrial Grade Network Switches

Learn about L2 and L3 Industrial Grade Network Switches, PoE vs non-PoE types, and how to choose the right rugged switch for your industrial setup.

VLANs in Industrial Networks — Segmenting Traffic for Performance ...

Each VLAN operates independently, and routing between them is controlled by a Layer 3 switch or industrial router with strict firewall rules. This design keeps time-sensitive control data

Industrial Switches for Rugged Conditions | Omada by TP-Link

© 2026 METRA FIBER MARKET - All rights reserved

Omada industrial switches are Easy Managed models, which are designed for daily operation without enterprise-level complexity. They support VLAN, QoS, STP/RSTP, and PoE management, and are

Cisco Industrial Ethernet 1000 Series Switches Data Sheet

Through a user-friendly web device manager, the IE 1000 provides easy out-of-the-box configuration and simplified operational manageability to

VLAN Segmentation and Network Isolation Functions of Industrial ...

VLAN Segmentation and Network Isolation Functions of Industrial Ethernet Switches: An In-Depth Analysis from Practical Applications to Value In the wave of the Industrial Internet of Things (IIoT),

4port Managed Industrial Gigabit Ethernet Switch L2 Smart ...

4port Managed Industrial Gigabit Ethernet Switch L2 Smart Fiber Optic Switch Support VLAN ERPS QoS with 2 SFP Fiber Ports Hardend Casing IP40 Protection Grade Brand: mtxneo 2.8 (2)

How should I choose an industrial grade Ethernet switch?

In modern industrial automation, Industrial Ethernet Switches (IES) have become a key component. Correctly selecting the right industrial grade switch is crucial to ensure the stability and

Layer 3 Managed Switches

Moxa''s Layer 3 managed switches feature industrial-grade reliability, multicast availability, and security enhancements based on the IEC 62443 standard. We offer toughened industry-specific products with

How to Configure VLAN on Industrial Managed Switches (Step-by

How to log in to your managed switch and access VLAN settings Assigning VLAN IDs and port roles (Access, Trunk) Network engineers IT professionals in industrial automation Plant managers and ...

Managed Industrial Ethernet Switches | Rugged DIN

Managed Industrial Ethernet Switches Compact DIN Rail Switches Specifically designed to connect devices in network environments that are subject to extreme

Segmenting a Network Using VLANs

s are assigned to a switch port. However, when a network is separated using VLANs, the devices are logically separated by Switches with VLAN capability can assign the tagged frames to specific

© 2026 METRA FIBER MARKET - All rights reserved

Goalake 24-Port Gigabit Easy Managed Switch – Plug & Play

Goalake 24-Port Gigabit Easy Managed Switch – Plug & Play Managed Network, VLAN & QoS Bandwidth Control, Industrial Grade Fan Design, Desktop/Rackmount, No Subscription Fee

Contact Us

Continue your research online:

Website: https://metramarket.es
Technical inquiry: https://metramarket.es/contact.html

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

© 2026 METRA FIBER MARKET - All rights reserved