

## EX77900 Series

IEC 61850-3/IEEE 1613 Lite L3 Hardened Managed 24-port Gigabit and 4-port 1G/10G SFP+ Ethernet Switch



## Spotlight

### + Hardened Grade

Wide operating temperature range for extreme environments  
Fanless and ruggedized housing  
High shock and electric noise immunity

### + 10GbE Connectivity

Four 10G SFP+ for connecting the switch to the core network

### + Lite Layer 3 Routing Features

Supports static route, RIP v1/v2 and OSPF  
Maximum number of routes in hardware: 64 entries  
Supports Virtual Router Redundancy Protocol (VRRP)

## Overview

### [When should you use an Industrial Layer 3 switch?](#)

EtherWAN's EX77900 Series provides a Hardened Full-Gigabit Managed 28-port switching platform that combines the advantages of Layer 3 routing protocols with robust management features and hardened specifications. With support for static routing, Routing Information Protocol (RIP) V1/V2, and Virtual Router Redundancy Protocol (VRRP), these switches deliver outstanding flexibility and security in a high performance and cost-effective package.

The EX77900 Series is equipped with twenty-eight gigabit ports, or a combination of twenty-four Gigabit copper ports and four 10G SFP+ for connecting the switch to the core network. Mountable on a 1U rack, the switches are equipped with EtherWAN's Alpha-Ring self-healing technology, providing less than 15ms fault recovery time making it ideal for applications intolerant to interruption.

A broad range of management features and options includes port security, IGMP snooping, port-based VLAN, GARP protocols, link aggregation and ACL, via web browser, telnet, SSH, SNMP, RMON, TFTP, and RS-232 console interfaces. With the hardened specifications, the EX77900 Series is designed to operate at -40 to 75°C in harsh environments, and is IEC 61850 & IEEE 1613 compliant, capable of operating under high EMI environments, making it an ideal choice for mission-critical applications.

EtherWAN — **"When Connectivity is Crucial."**

## Features

### Management

- » Interface
    - CLI, Telnet and Web Browser
    - SNMP v1/v2c/v3
  - » Firmware and configuration upgrade and backup via TFTP
  - » Supports DHCP Server/Client
  - » RMON (Remote Monitoring)
  - » Port mirroring: TX/RX and both
  - » NTP (Network Time Protocol) time synchronization
  - » IEEE 802.1ab LLDP (Link Layer Discovery Protocol)
  - » IPv4/IPv6
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### Security

- » MAC address filtering
  - » Enable/Disable port
  - » Storm control (Broadcast and multicast types)
  - » IEEE 802.1x LAN access control
  - » Remote authentication through RADIUS and TACACS+
  - » SSH for CLI and Telnet security
  - » SSL for web security
  - » ACL
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### Quality of Service (QoS)

- » Priority Queues: 4 queues per port
  - » Traffic classification based on IEEE 802.1p CoS, DSCP, WRR (Weighted Round Robin) and strict mode
  - » Rate Limiting (Ingress/Egress)
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### Layer 2 Features

- » Auto-negotiation for port speed and duplex mode
- » Flow Control
- » IEEE 802.3x full duplex mode
  - Back-Pressure half duplex mode
- » Redundant Protocol

- IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
  - EtherWAN's Alpha-Ring network fault recovery (<15ms) and Alpha-Chain
- » VLANs
- IEEE 802.1Q Tag VLANs (128 groups, 4096 VID)
  - GVRP (GARP VLAN Registration Protocol)
  - GMRP (GARP Multicast Registration Protocol)
- » Link Aggregation
- Static Trunk (4 groups, support MAC base)
  - IEEE 802.3ad Link Aggregation Control Protocol
- » IGMP Snooping
- IGMP Snooping v1/v2/v3
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## Layer 3 Features

- » Routing Protocols
- Maximum number of routes in hardware:64 entries
  - Static routing
  - RIP v1/v2
  - OSPF v2
- » Routing Redundancy
- VRRP
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# Specifications

## Technology

### Standards

- IEEE 802.3 10BASE-T
- IEEE 802.3u 100BASE-TX/100BASE-FX
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3z 1000BASE-SX/1000BASE-LX
- IEEE 802.3x Full duplex and flow control
- IEEE 802.1p QoS
- IEEE 802.1Q Tag VLANs
- IEEE 802.1w RSTP
- IEEE 802.1x Port-based Network Access Control

### Forward and Filtering Rate

- 14,880pps for 10Mbps
- 148,810pps for 100Mbps
- 1,488,100pps for 1000Mbps
- 14,880,952pps for 10Gbps

### Packet Buffer Memory

- 12M bits

### Processing Type

- Store-and-Forward
- Auto Negotiation
- Half-duplex back-pressure and IEEE 802.3x full-duplex flow control
- Auto MDI/MDIX

### Address Table Size

- 16K MAC addresses
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## Power

### Input

- Power input can be configured as:

1.  $\pm$ 48VDC (Terminal Block)
2. 88-300VDC or 100-240VAC (Terminal Block)
3. 100–240VAC (AC Inlet)
4.  $\pm$ 48VDC Redundant (Terminal Block)
5. 88-300VDC or 100-240VAC Redundant (Terminal Block)
6. 100–240VAC Redundant (AC Inlet)

### **Power Consumption**

- 31.08W
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## Mechanical

### **Casing**

- Metal Case
- IP30

### **Dimensions**

- 430 x 375 x 44.2mm (W x D x H)  
(16.9" x 14.7" x 1.74")

### **Weight**

- 5.27kg

### **Installation**

- Rack mounting
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## Interface

### **Ethernet Port**

- 10/100/1000BASE-TX: 16 or 24 ports
- 100/1000BASE-SX/LX/BX/SFP: 8 ports
- 10G SFP+: 4 ports

### **Console Port**

- One DB9 RS-232 port

### **USB Port**

- One USB Port (Type A connector)

### **Alarm Contact**

- One relay output with current 0.6A/30VDC

### **LED Indicators**

- Per Unit: Power 1, Power 2, Alarm
  - Per Port: Link/Activity (Green)
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## **Environment**

### **Operating Temperature**

- -40 to 75°C (-40 to 167°F)

### **Storage Temperature**

- -45 to 85°C (-49 to 185°F)

### **Ambient Relative Humidity**

- 5% to 95% (non-condensing)
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## **Regulatory Approvals**

### **ISO**

- Manufactured in an ISO 9001 facility

### **Safety**

UL 62368

### **EMI**

FCC Part 15B Class A

VCCI Class A

EN 61000-6-4

EN 61000-3-2

EN 61000-3-3

### **EMS**

EN 61000-6-2

- EN 61000-4-2 (ESD Standards)
- EN 61000-4-3 (Radiated RFI Standards)

- EN 61000-4-4 (Burst Standards)
- EN 61000-4-5 (Surge Standards)
- EN 61000-4-6 (Induced RFI Standards)
- EN 61000-4-8 (Magnetic Field Standards)

### **Environmental Test Compliance**

IEC 60068-2-6 Fc (Vibration Resistance)

IEC 60068-2-27 Ea (Shock)

FED STD 101C Method 5007.1 (Free fall w/package)

### **Industrial Compliance**

IEC 61850-3/IEEE 1613

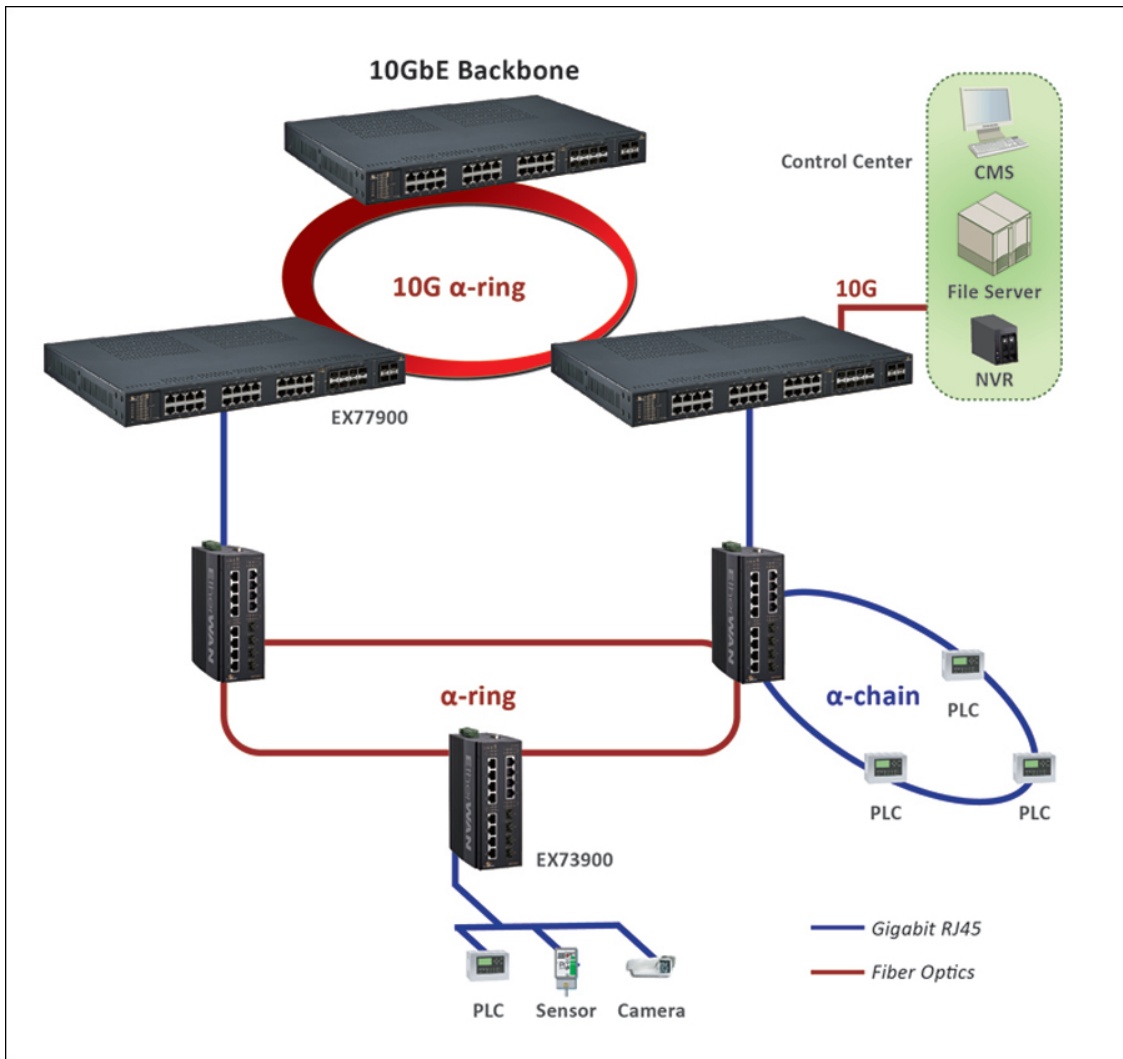
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NEMA TS2

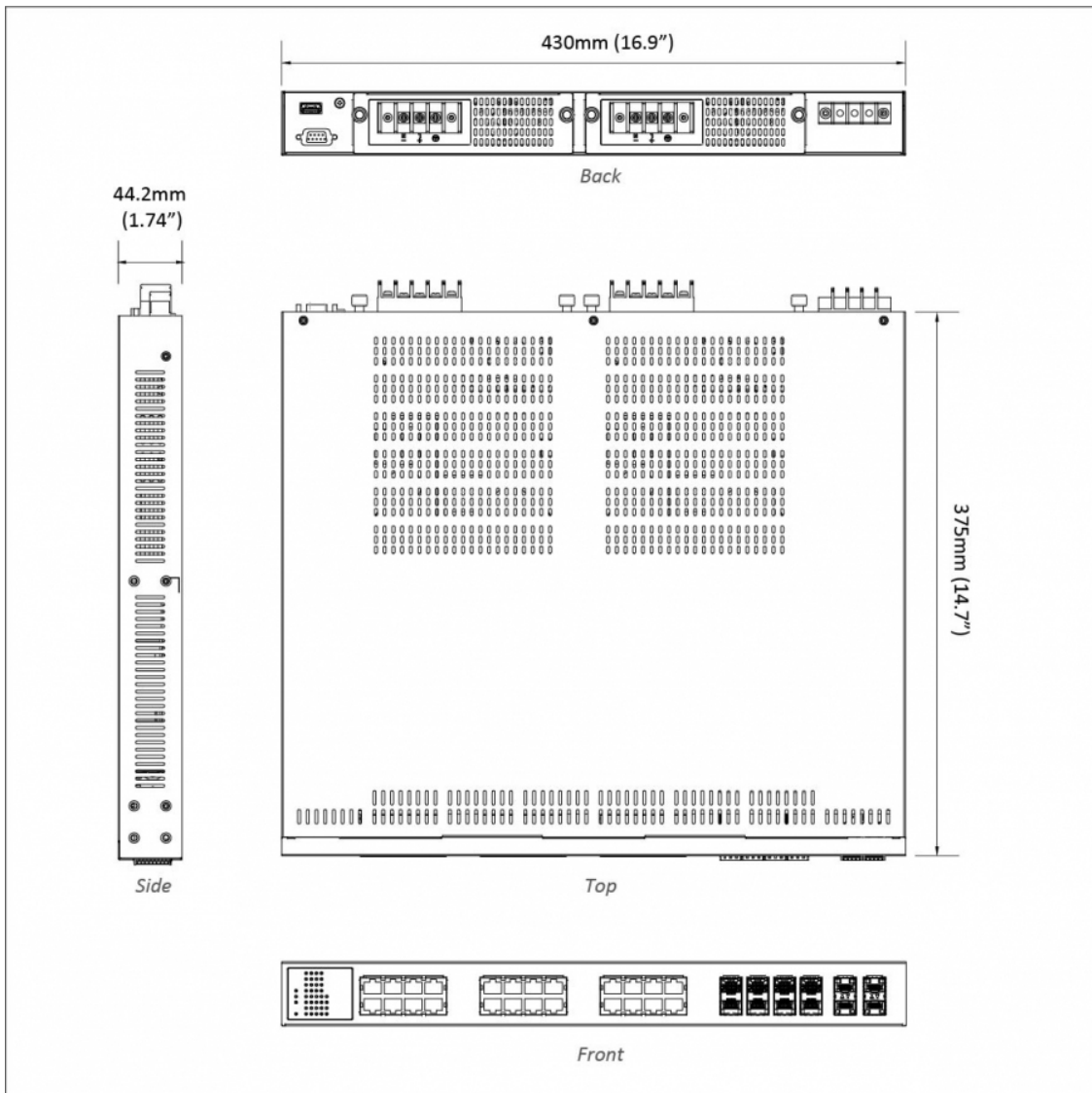
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# Application



# Dimensions



## Ordering Info

### Model

<b>EX77964-8VZ</b>	16-port 10/100/1000BASE-TX +8-port 100/1000BASE SFP Combo +4-port 1G/10G SFP+ Hardened Managed Ethernet Switch
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### Power Input Interface (Z)

<b>T</b>	±48VDC (Terminal Block)
<b>W</b>	88-300VDC or 100-240VAC (Terminal Block)
<b>C</b>	100-240VAC (AC Inlet)
<b>TR</b>	±48VDC Redundant (Terminal Block)
<b>WR</b>	88-300VDC or 100-240VAC Redundant (Terminal Block)
<b>CR</b>	100-240VAC Redundant (AC Inlet)

### Optional Accessory

<b>EB-232</b>	Configuration Backup and Restoration Tool for EtherWAN switch with firmware 2.01.1 or above
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