EX77900 Series

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

Overview

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."

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

Software 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

Security

- MAC address filtering
- Enable/disable port
- Storm control (broadcast and multicast types)
- IEEE 802.1x LAN access control
- Remote authentication through RADIUS
- SSH for CLI and Telnet security
- SSL for web security
- ACL

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)

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

Layer 3 Features

- IP Packet Routing
  - Maximum number of routes in hardware: 64 entries
  - Static routing
  - RIP v1/v2
- Routing Redundancy
  - VRRP

Hardware 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

Power

Input
- Power input can be configured as:
  1. ±48VDC (Terminal Block)
  2. 100-240VAC (Terminal Block)
  3. 100-240VAC (AC Inlet)
  4. ±48VDC Redundant (Terminal Block)
  5. 100-240VAC Redundant (Terminal Block)
  6. 100-240VAC Redundant (AC Inlet)

Power Consumption
- 31.08W

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

Interface

Ethernet Ports
- 10/100/1000BASE-TX: 24 or 16 ports
- 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
- Per Port: Link/Activity (Green)

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)

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)

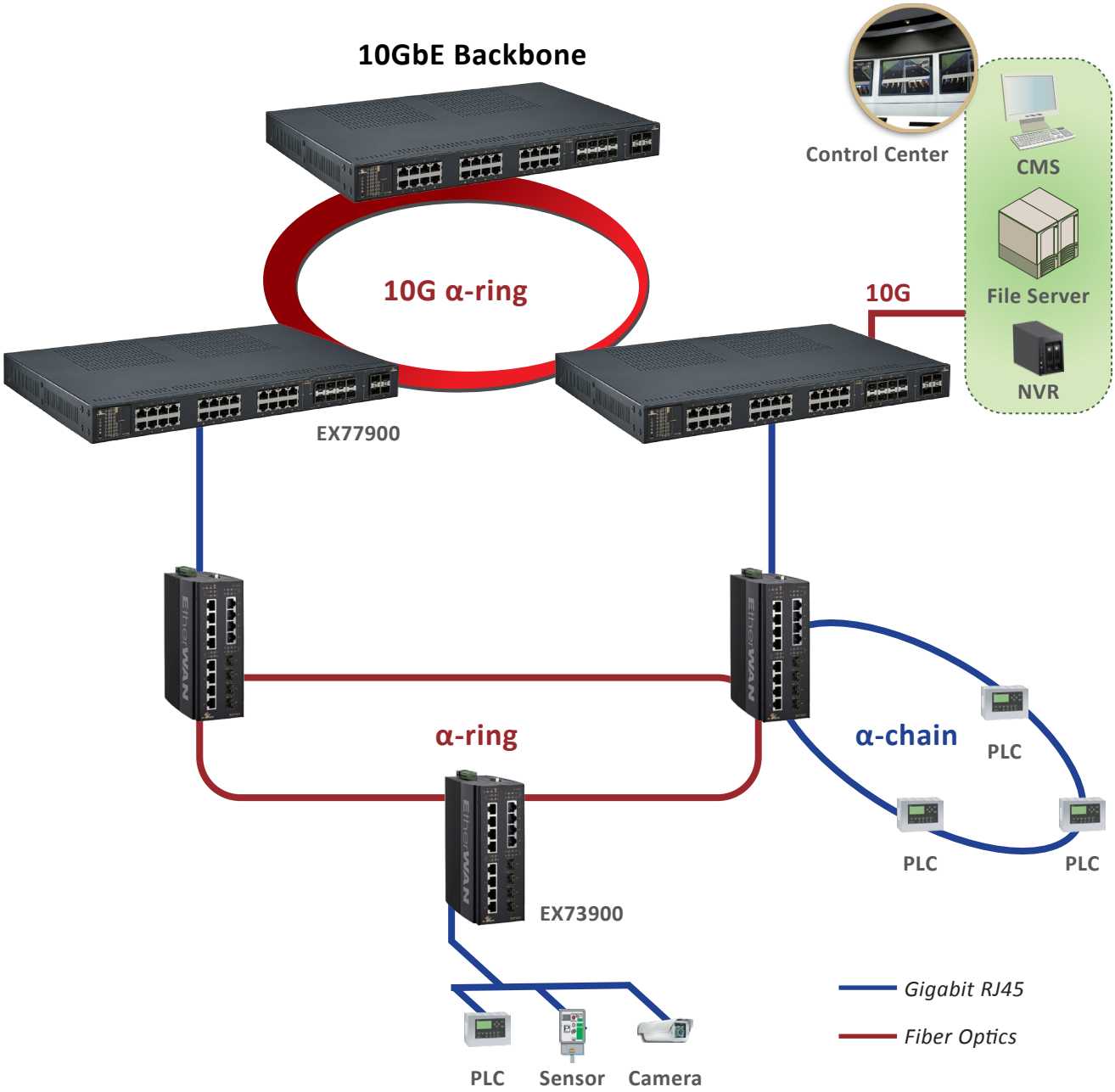
FED STD 101C Method 5007.1 (Free fall w/package)

Industrial Compliance

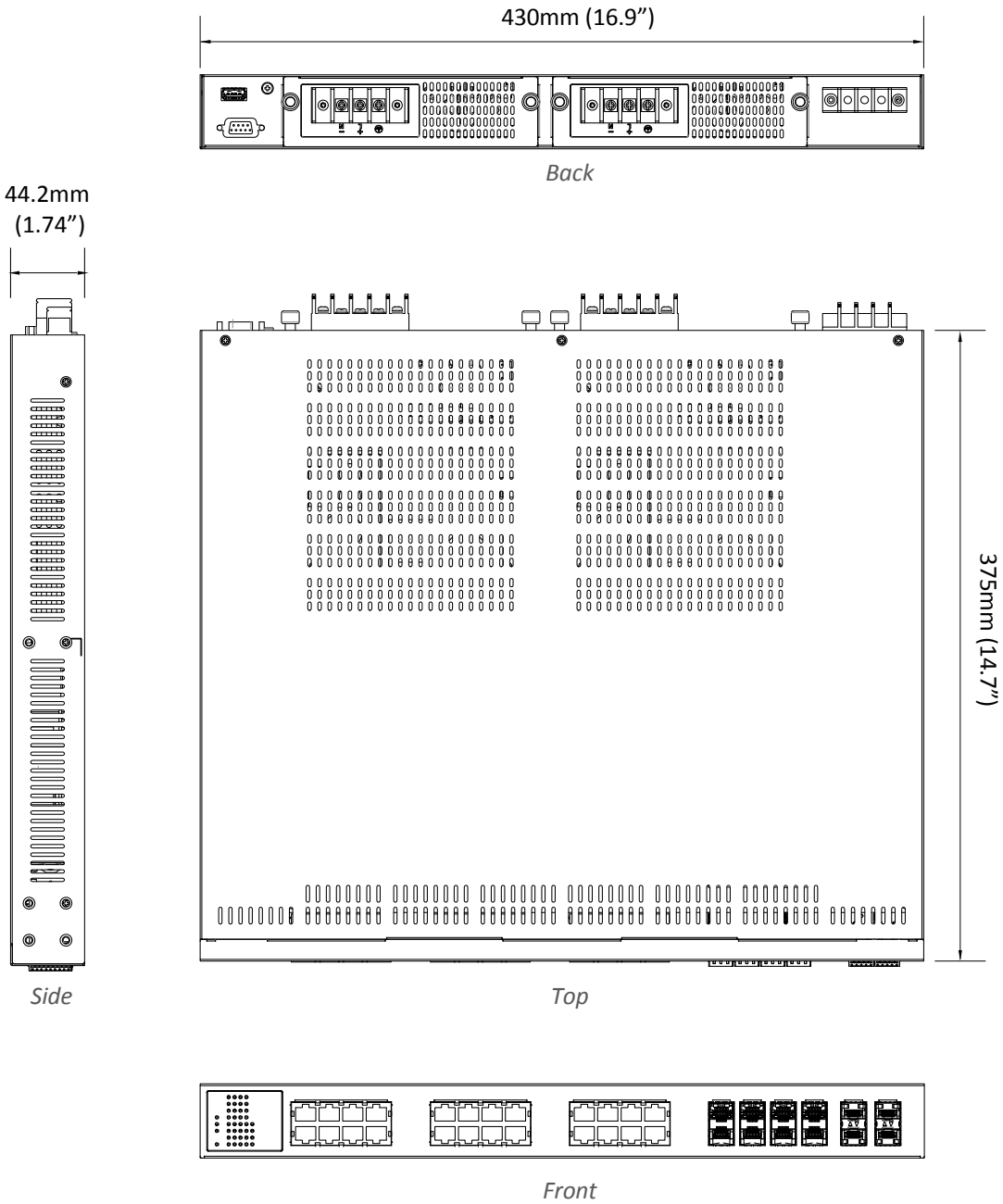
IEC 61850-3/IEEE 1613

NEMA TS2

Application Diagram



Dimensions



Ordering Information

Model

EX77964-8VZ	16-port 10/100/1000BASE-TX +8-port 1000BASE SFP Combo +4-port 1G/10G SFP+ Hardened Managed Ethernet Switch
EX77964-8XZ	16-port 10/100/1000BASE-TX +8-port 1000BASE SX/LX/BX +4-port 1G/10G SFP+ Hardened Managed Ethernet Switch

Gigabit Port Options (X)

3	1000BASE-SX (SC) - 550m
4	1000BASE-SX (SC) - 2Km
5	1000BASE-SX (ST) - 550m
A	1000BASE-LX (SC) - 10Km
B	1000BASE-LX (SC) - 20Km
R	1000BASE-BX (SC) WDM-TX: 1310nm/RX: 1550nm-20Km
S	1000BASE-BX (SC) WDM-TX: 1550nm/RX: 1310nm-20Km

** More Gigabit options are also available upon request.*

Power Input Interface (Z)

T	±48VDC (Terminal Block)
W	100-240VAC (Terminal Block)
C	100-240VAC (AC Inlet)
TR	±48VDC Redundant (Terminal Block)
WR	100-240VAC Redundant (Terminal Block)
CR	100-240VAC Redundant (AC Inlet)

Optional Accessory

EB-232	Configuration Backup and Restoration Tool for EX77900 switch with firmware 2.01.1 or above