EX87000 Series

IEC 61850-3/IEEE 1613 Hardened Managed 24-port 10/100BASE and 4-port Gigabit Ethernet Switch with SFP options

Overview

EtherWAN's EX87000 Series provides a hardened fully managed 28-port switching platform combining high performance switching backbone with robust and secure management features required for mission critical and harsh environments where sustained connectivity is crucial.

The EX87000 Series is equipped with 24 fast Ethernet ports, in combination with up to 4 Gigabit, fixed fiber, or SFP combo port options. Mountable on a 1U rack, the EX87000 Series is equipped with EtherWAN's Alpha-Ring self-healing technology, providing less than 15ms fault recovery time making it ideal for applications intolerant to interruption.

Users are able to access management features such as port security, IGMP snooping, VLANs, GARP protocols, and LACP via web browser, Telnet, SNMP, RMON, TFTP, and RS-232 console interfaces. The EX87000 allows GOOSE messages to be passed through without modifying the frame contents.

With its IEC 61850-3 and IEEE 1613 certified for power substations, EN 50121-4 certified for railway applications, and NEMA-TS2 certification for traffic applications, the EX87000 Series is capable of operating under high EMI environments at the temperatures ranging from -40 to 75°C (-40 to 167°F), making it an ideal choice for harsh environment applications.

EtherWAN - "When Connectivity is Crucial."

Spotlight

- **Versatile Connectivity**
  - Provides flexibility of 24-port 10/100BASE-TX/FX/BX/SFP plus 4-port Gigabit-TX/SX/LX/BX/SFP

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

- **KEMA-Certified**
  - IEC 61850-3 and IEEE 1613 performance tests conducted by KEMA

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 and TACAS+
- SSH for CLI and Telnet security
- SSL for web security
- ACL
- Multi-level user account/password against unauthorized configuration

Quality of Service (QoS)

- Priority Queues: 8 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 (8 groups, support MAC base)
  - IEEE 802.3ad Link Aggregation Control Protocol
- IGMP Snooping
  - IGMP Snooping v1/v2/v3

Performance

- Switching Capability: 12.8Gbps
- Jumbo Frame: 9K bytes

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

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
- (T): ±48VDC Internal Universal PSU
- (W): 88-300VDC or 100-240VAC Internal Universal PSU
- (C): 100-240VAC, 50-60Hz Internal Universal PSU

Power Consumption
- For models with all copper ports:
  EX87604 Series: 21.9W@230VAC
- For models with all fiber ports:
  EX87064 Series: 40.6W@230VAC

Mechanical

Casing
- Metal Case
- IP30

Dimensions
- 442 x 375 x 44mm (W x D x H)
  (17.4" x 14.7" x 1.73")

Weight
- 5Kg (11lbs.)

Installation
- Rack mounting

Interface

Ethernet Port
- 10/100BASE-TX: 0, 8, 16 or 24 ports
- 100BASE-FX: 0, 8, 16 or 24 ports
- Gigabit: 4 ports

Console Port
- Port: One DB9 RS-232 port

Alarm Contact
- One relay output with current 0.6A/30VDC

LED Indicators
- Per Unit: Power, Alarm
- Per Port: Link/Activity (Green)
- Per SFP Slot: Selected (Green)

Environment

Operating Temperature
- -40 to 75°C (-40 to 167°F)
  Tested @ -40 to 85°C (-40 to 185°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

EN 61000-6-4

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)
- IEC 61000-4-10 (Oscillatory wave magnetic field test)
- IEC 61000-4-16 (Power frequency immunity test)

Environmental Test Compliance

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

IEC 60068-2-6 Fc (Vibration Resistance)

IEC 60068-2-27 Ea (Shock)

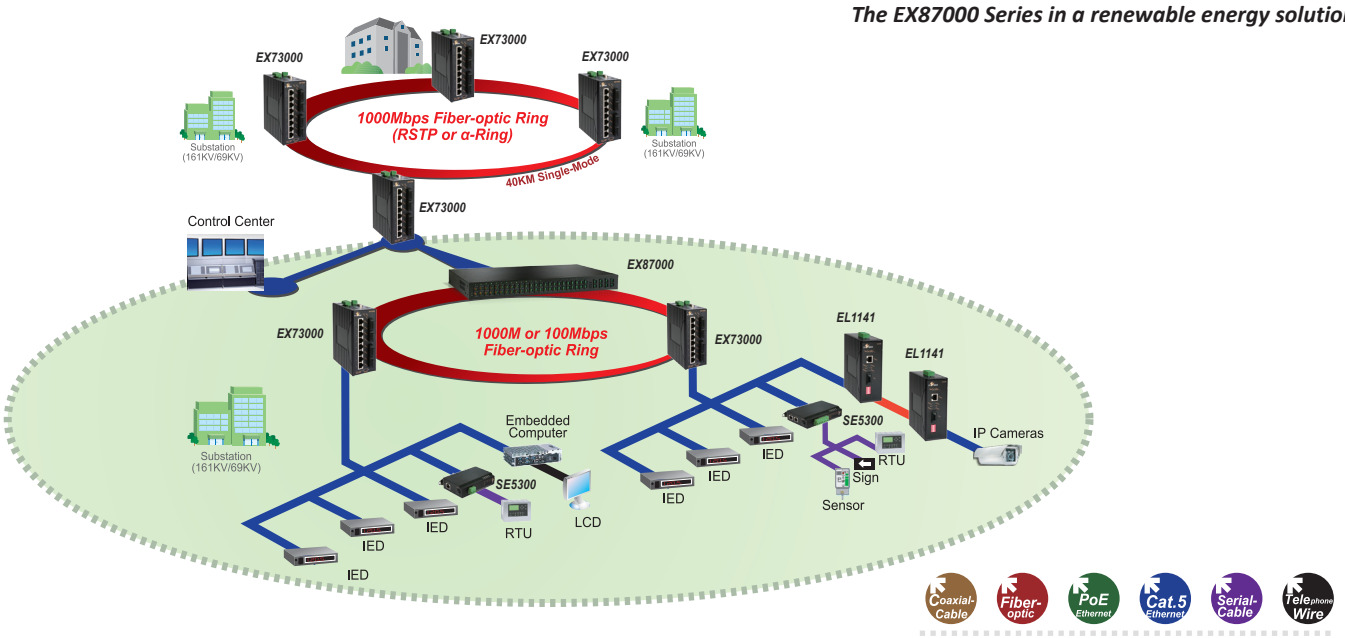
Industrial Compliance

IEC 61850-3/IEEE 1613

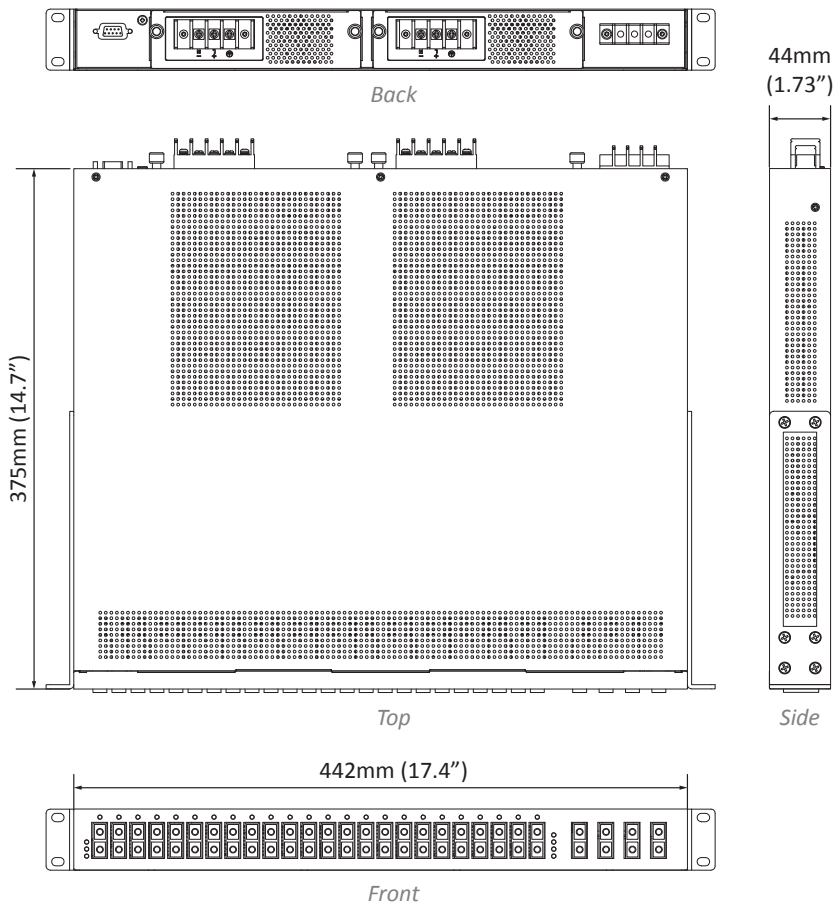
EN 50121-4

NEMA TS2

Application Diagram



Dimension



Ordering Information

Model

EX87604-0XYZ	24-port 10/100BASE-TX +4-port Gigabit Hardened Managed Ethernet Switch
EX87424-WXYZ	16-port 10/100BASE-TX +8-port 100BASE-FX +4-port Gigabit Hardened Managed Ethernet Switch
EX87244-WXYZ	8-port 10/100BASE-TX +16-port 100BASE-FX +4-port Gigabit Hardened Managed Ethernet Switch
EX87064-W4YZ	24-port 100BASE-FX +4-port Gigabit Hardened Managed Ethernet Switch
EX87064-V0VZ	24-port 100BASE-SFP +4-port Gigabit SFP Combo Hardened Managed Ethernet Switch

** Rack mounting kit included.*

100FX Fiber Options (W)

1	Multi Mode (SC) - 2Km
2	Multi Mode (ST) - 2Km
A	Single Mode (SC) - 20Km
H	Single Mode (ST) - 20Km
P	Single Mode (SC) WDM-TX: 1310nm/RX: 1550nm-20Km
Q	Single Mode (SC) WDM-TX: 1550nm/RX: 1310nm-20Km
V	100BASE SFP

** More 100FX Fiber options also available upon request.*

Numbers of Fixed Gigabit Fiber (X)

0	None
4	Four Gigabit Fiber ports

Gigabit Port Options (Y)

3	1000BASE-SX (SC) - 550m
4	1000BASE-SX (SC) - 2Km
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
V	4-port 100/1000BASE SFP Combo with 10/100/1000BASE-TX

** More Gigabit options also available upon request.*

Power Input Interface (Z)

TR	±48VDC Redundant (Terminal Block)
WR	88-300VDC or 100-240VAC Redundant (Terminal Block)
CR	100-240VAC Redundant (AC Inlet)