EX78000 Series

Hardened Managed 10-port 10/100BASE (8 x PoE) and 2-port Gigabit Ethernet Switch

EtherWAN

Overview

EtherWAN's EX78000 Series provides a hardened 12-port switching platform supporting IEEE802.3at Power over Ethernet, high performance switching with robust management features required for mission-critical and harsh environments where sustained connectivity is crucial.

The EX78000 Series is equipped with 8 10/100BASE-TX PoE ports, in combination with two Gigabit SX/LX/BX/WDM Fiber ports with SFP options. The IEEE802.3at PoE ports provide up to 30W/port with a total power budget of 180W, making the switch truly versatile for connecting with PoE Powered Devices (PD) with different bandwidth and power consumption requirements such as outdoor PTZ dome cameras, wireless access points, and way-side communication devices.

Din rail mountable, the EX78000 Series is equipped with EtherWAN's Alpha-Ring self-healing ring technology providing less than 15ms fault recovery time. Users are able to access management features such as port security, IGMP snooping, port-based VLAN, GARP protocols, link aggregation, via web browser, telnet, SSH, SNMP, RMON, TFTP, and RS-232 console interfaces. With the hardened specifications, the EX78000 Series is designed to operate at -40°C to 75°C in harsh environments, where high ESD, shock, and vibration may be present.

EtherWAN — "When Connectivity is Crucial."

Spotlight

- **Versatile PoE Connectivity**
  - 10-port 10/100BASE-TX/FX/BX/SFP plus 2-port Gigabit-TX/SX/LX/SFP
  - Port 1 to 8 supports IEEE802.3af or IEEE802.3at Power over Ethernet

- **Hardened Grade**
  - Wide operating temperature range from -40°C to 75°C (-40°F to 167°F) for extreme environments
  - Fanless and ruggedized housing
  - High shock and electric noise immunity
  - Complies with NEMA TS2 for traffic control equipment

- **Secure Remote Access**
  - IEEE802.1x and RADIUS support

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): group 1, 2, 3, 9
- Port mirroring: TX/RX and both
- SFP transceivers support Digital Diagnostics Monitoring (DDM)
- NTP (Network Time Protocol) time synchronization
- IEEE802.1ab LLDP (Link Layer Discovery Protocol)

Security

- MAC address filtering
- Enable/disable port
- Storm control (broadcast and multicast types)
- IEEE802.1x LAN access control
- Remote authentication through RADIUS
- SSH for CLI and Telnet security
- SSL for web security
- Multi-level user account/password against unauthorized configuration
- System log (remote/local)

Quality of Service (QoS)

- Priority Queues: 4 queues per port
- Traffic classification based on IEEE802.1p 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
  - IEEE802.3x full duplex mode
  - Back-Pressure half duplex mode
- Redundant Protocol
  - IEEE802.1D Spanning Tree Protocol (STP)
  - IEEE802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE802.1s Multiple Spanning Tree Protocol (MSTP)
  - EtherWAN's Alpha-Ring network fault recovery (<15ms)
- VLANs
  - Port-based VLANs
  - IEEE802.1Q Tag VLANs (128 groups, 4096 VID)
  - GVRP (GARP VLAN Registration Protocol)
  - GMRP (GARP Multicast Registration Protocol)
- Link Aggregation
  - Static Trunk (2 groups, support MAC base)
  - IEEE802.3ad Link Aggregation Control Protocol
- IGMP Snooping
  - IGMP snooping v1/v2/v3

Performance

- Switching Capability: 6Gbps
- Packet Buffer Size: 2M
- MAC Address Table: 8K

Hardware Specifications

Technology

Standards
- IEEE802.3 10BASE-T
- IEEE802.3u 100BASE-TX/100BASE-FX
- IEEE802.3ab 1000BASE-T
- IEEE802.3z 1000BASE-SX/1000BASE-LX
- IEEE802.3x Full duplex and flow control
- IEEE802.1p QoS
- IEEE802.1Q Tag VLANs
- IEEE802.1w RSTP
- IEEE802.1x Port-based Network Access Control
- IEEE802.3af/at Power over Ethernet (PoE)

Forward and Filtering Rate
- 14,880pps for 10Mbps
- 148,810pps for 100Mbps
- 1,488,100pps for 1000Mbps

Packet Buffer Memory
- 2M bits

Processing Type
- Store-and-Forward
- Auto Negotiation
- Half-duplex back-pressure and IEEE802.3x full-duplex flow control
- Auto MDI/MDIX

Address Table Size
- 8192 MAC addresses

Power

Input
- Redundant power input:
  Terminal Block: 47 - 57VDC
  DC Jack: 47 - 57VDC

Power Consumption
- Device: Max. 15W (without PoE)
- PoE power budget (depends on power input):
  181.6W Max.

PoE Power Output
- Port 1 to 8 support PoE
  IEEE802.3af: up to 15.4W/port, 47 - 55VDC, 350mA Max.
  IEEE802.3at: up to 30W/port, 52 - 57VDC, 600mA Max

Protection
- Reverse polarity protection

Mechanical

Casing
- Metal Case
- IP30

Dimensions
- 71.4mm (W) x 140mm (D) x 170mm (H)
  (2.85" (W) x 5.6" (D) x 6.8" (H))

Weight
- 1.7Kg (3.74lbs.)

Installation
- Din-Rail (Top hat type 35mm) or Wall mounting

Interface

Ethernet Port
- 10/100BASE-TX (PoE): 8 or 4 ports
- 100BASE-FX: 0, 2 or 4 ports
- Gigabit: 0, 1 or 2 ports

Console Port
- Port: One DB9 RS-232 port

Alarm Contact
- One relay output with current 1A @ 24VDC

LED Indicators
- Per Unit: Power 1, Power 2, Power 3
- Per Port: Link/Activity (Green)
- Per PoE Port: PoE (Orange)

Environment

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

Storage Temperature
- -45°C to 85°C (-49°F to 185°F)

Ambient Relative Humidity
- 5% to 95% (non-condensing)

Regulatory Approvals

ISO
- Manufactured in an ISO9001 facility

Safety

UL508

EMI

FCC Part 15B, Class A

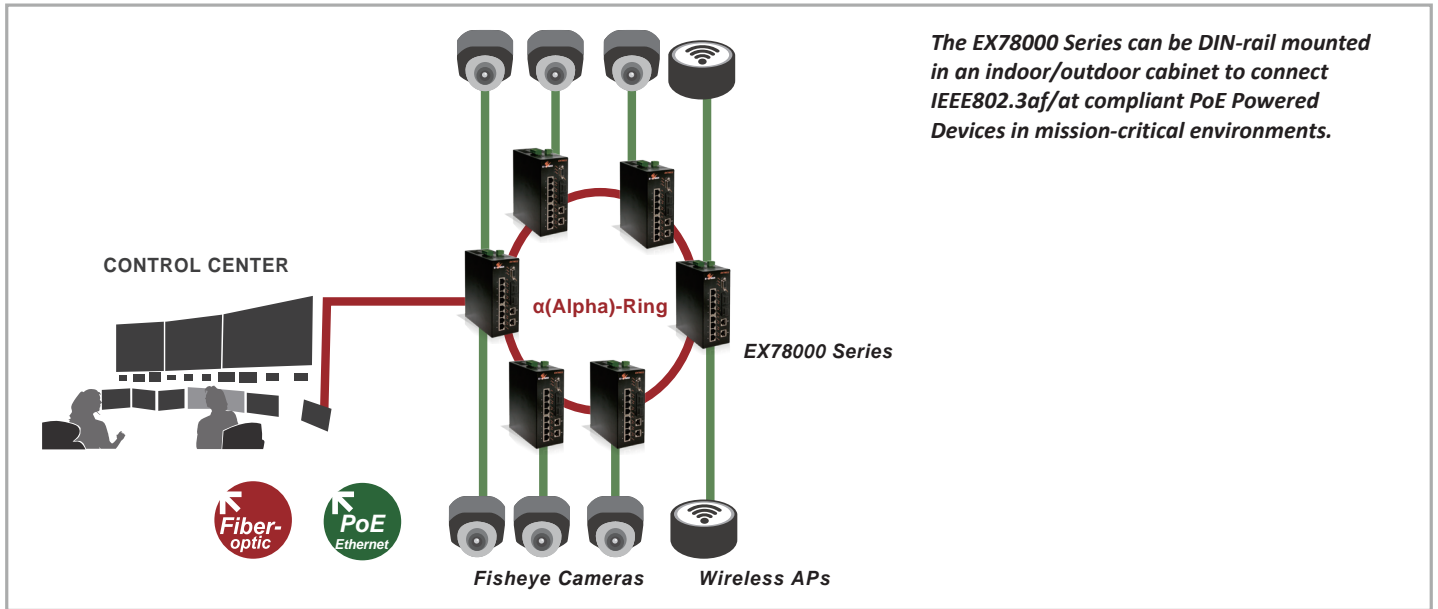EN61000-6-4

EN55022

EN61000-3-2

EN61000-3-3

EMS

EN61000-6-2
- EN61000-4-2 (ESD Standards)
- EN61000-4-3 (Radiated RFI Standards)
- EN61000-4-4 (Burst Standards)
- EN61000-4-5 (Surge Standards)
- EN61000-4-6 (Induced RFI Standards)
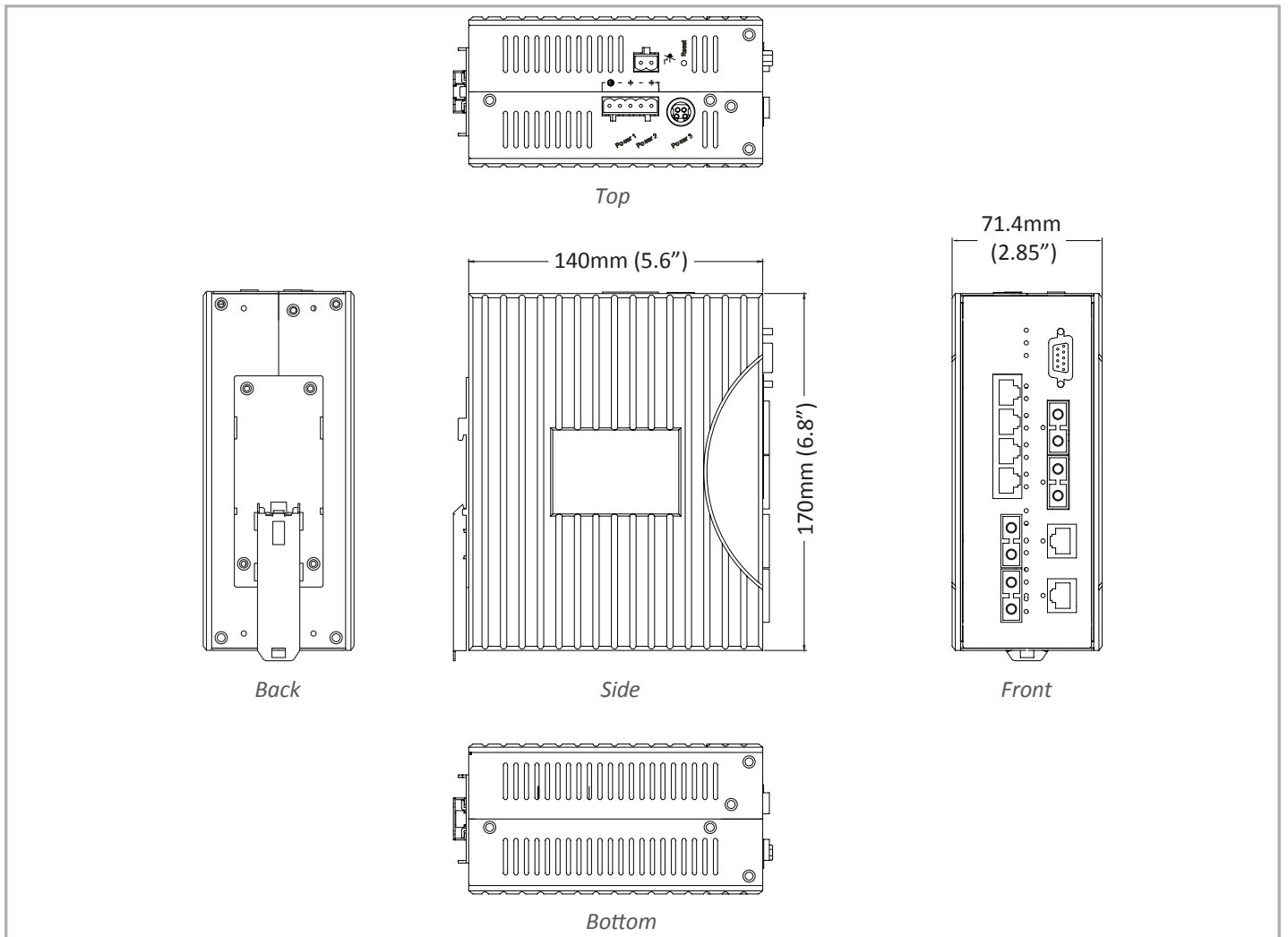- EN61000-4-8 (Magnetic Field Standards)

Environmental Test Compliance

IEC60068-2-6 Fc (Vibration)

Application Diagram

The EX78000 Series can be DIN-rail mounted in an indoor/outdoor cabinet to connect IEEE802.3af/at compliant PoE Powered Devices in mission-critical environments.

CONTROL CENTER

α(Alpha)-Ring

EX78000 Series

Fiber-optic

PoE Ethernet

Fisheye Cameras

Wireless APs

Dimensions

Top

140mm (5.6")

170mm (6.8")

71.4mm (2.85")

Back

Side

Front

Bottom

Ordering Information

Model

EX78400-00B-P	4-port 10/100BASE-TX PoE Hardened Managed Ethernet Switch
EX78401-0YB-P	4-port 10/100BASE-TX PoE + 1-port Gigabit Hardened Managed Ethernet Switch
EX78402-0YB-P	4-port 10/100BASE-TX PoE + 2-port Gigabit Hardened Managed Ethernet Switch
EX78420-X0B-P	4-port 10/100BASE-TX PoE + 2-port 100BASE-FX Hardened Managed Ethernet Switch
EX78440-X0B-P	4-port 10/100BASE-TX PoE + 4-port 100BASE-FX Hardened Managed Ethernet Switch
EX78441-XYB-P	4-port 10/100BASE-TX PoE + 4-port 100BASE-FX + 1-port Gigabit Hardened Managed Ethernet Switch
EX78442-XYB-P	4-port 10/100BASE-TX PoE + 4-port 100BASE-FX + 2-port Gigabit Hardened Managed Ethernet Switch
EX78800-00B-P	8-port 10/100BASE-TX PoE Hardened Managed Ethernet Switch
EX78801-0YB-P	8-port 10/100BASE-TX PoE + 1-port Gigabit Hardened Managed Ethernet Switch
EX78802-0YB-P	8-port 10/100BASE-TX PoE + 2-port Gigabit Hardened Managed Ethernet Switch
EX78820-X0B-P	8-port 10/100BASE-TX PoE + 2-port 100BASE-FX Hardened Managed Ethernet Switch
EX78821-XYB-P	8-port 10/100BASE-TX PoE + 2-port 100BASE-FX + 1-port Gigabit SX/LX/BX/SFP Hardened Managed Ethernet Switch
EX78822-XYB-P	8-port 10/100BASE-TX PoE + 2-port 100BASE-FX + 2-port Gigabit SX/LX/BX/SFP Hardened Managed Ethernet Switch

* Rack mounting kit included

100FX Fiber Options (X)

1	Multi Mode (SC) - 2Km
2	Multi Mode (ST) - 2Km
6	Multi Mode (SC) WDM-TX:1310nm/RX:1550nm - 2Km
7	Multi Mode (SC) WDM-TX:1550nm/RX:1310nm - 2Km
8	Multi Mode (SC) WDM-TX:1310nm/RX:1550nm - 5Km
9	Multi Mode (SC) WDM-TX:1550nm/RX:1310nm - 5Km
A	Single Mode (SC) - 20Km
B	Single Mode (SC) - 40Km
F	Single Mode (FC) - 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
R	Single Mode (SC) WDM-TX:1310nm/RX:1550nm - 40Km
V	Support 2-port 100BASE SFP (DDM)

*More 100FX fiber options also available upon request.

Gigabit Port Options (Y)

1	10/100/1000BASE-TX
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
V	Support 2-port 1000BASE SFP (DDM)

* More Gigabit options also available upon request.

Ordering Information - continued

PoE Type (P)

T	8 ports IEEE802.3at

Optional Accessories

DR-120-48	120W/2.5A DIN-Rail 48VDC Industrial Power Supply (for terminal block)
SDR-240-48	240W/5A DIN-Rail 48VDC Industrial Power Supply