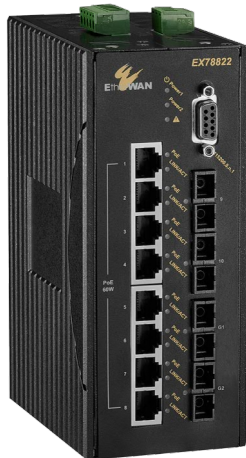


# EX78000 Series

Hardened Managed 4 to 10-port 10/100BASE (8 x PoE) and 2-port Gigabit Ethernet Switch



## Overview

EtherWAN's EX78000 Series provides a hardened 12-port switching platform supporting 60W 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 100/1000BASE SFP options. The Ultra PoE ports provide up to 60 Watts per port with a total power budget of 240 Watts. This ensures maximum versatility when used in conjunction with powered devices having different bandwidth and power consumption requirements. Applications include outdoor PTZ (Pan-tilt-zoom) dome cameras, wireless access points, and way-side communication devices.

With support for EtherWAN's Alpha-Ring protocol, fault recovery times are guaranteed to be under 15 milliseconds, making these switches ideal for applications that are intolerant to interruption. Robust management features include IPV4/IPV6 protocols, port security, IGMP snooping, port-based VLANs, GARP protocols, and link aggregation. Management is via web browser, Telnet, SSH, SNMP, TFTP, and RS-232 console interfaces.

With the hardened specifications, the EX78000 can operate in ambient temperatures from -40 to 75°C (-40 to 167°F), and in locations where high electrostatic discharge, shock, and vibration may be present.

EtherWAN — "When Connectivity is Crucial."

## Spotlight

- **PoE power budget up to 60W/port (Ultra PoE), total 240W**
  - Ports 1 to 8 support IEEE 802.3af/at/60W Power over Ethernet
- **Available with either copper, SC, ST ,WDM or SFP interface**
  - 2-port 10/100BASE-FX/BX/SFP plus 2-port Gigabit-TX/SX/LX/SFP
- **Dual firmware image support**
  - Dual flash images provide independent primary and secondary operating system files for backup

# Software Features

## Management

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- 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
- IEEE 802.1ab LLDP (Link Layer Discovery Protocol)
- IPV4/IPV6\*

\* Available in Q2,2018

## Security

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- 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
- Multi-level user account/password against unauthorized configuration
- System log (remote/local)
- ACL

## Quality of Service (QoS)

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- 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

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- 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)
- VLANs
  - IEEE 802.1Q 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)
  - IEEE 802.3ad Link Aggregation Control Protocol
- IGMP Snooping
  - IGMP snooping v1/v2/v3

# Hardware Specifications

## Technology

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### 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
- IEEE 802.3af/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

- 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

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### Input

- Redundant power input:  
Terminal Block: 52-57VDC

### Power Consumption

- Device: Max. 10.4W (without PoE)
- PoE power budget: 240W Max.

### PoE Technology

- Alternative A & B  
Pins 1/2(+), 3/6(-), Pins 7/8(+), 4/5(-)

### PoE Power Output

- Port 1 to 8 support PoE+ (15.4W/30W/60W)  
IEEE 802.3af: up to 15.4W/port, 47-57VDC  
IEEE 802.3at: up to 30W/port, 52-57VDC  
60W/port, 52-57VDC

### Protection

- Reverse polarity protection

## Mechanical

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### Casing

- Metal Case
- IP30

### Dimensions

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

### Weight

- 1.7Kg (3.74lbs.)

### Installation

- Din-Rail

## Interface

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### Ethernet Port

- 10/100BASE-TX (PoE): 8 or 4 ports
- 100BASE-FX: 0, 2 or 4 ports
- 100/1000 Base SFP slot: 2 ports
- Gigabit: 2 ports

### Console Port

- Port: One DB9 RS-232 port

### Alarm Contact

- One relay output with current 0.5A@48VDC (UL 61010)

### LED Indicators

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

## Environment

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### 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

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### ISO

- Manufactured in an ISO 9001 facility

### Safety

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#### UL 61010

### EMI

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#### FCC Part 15B Class A

#### EN 61000-6-4

### EMS

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#### 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

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#### IEC 60068-2-6 Fc (Vibration)

#### IEC 60068-2-27 Ea (Shock)

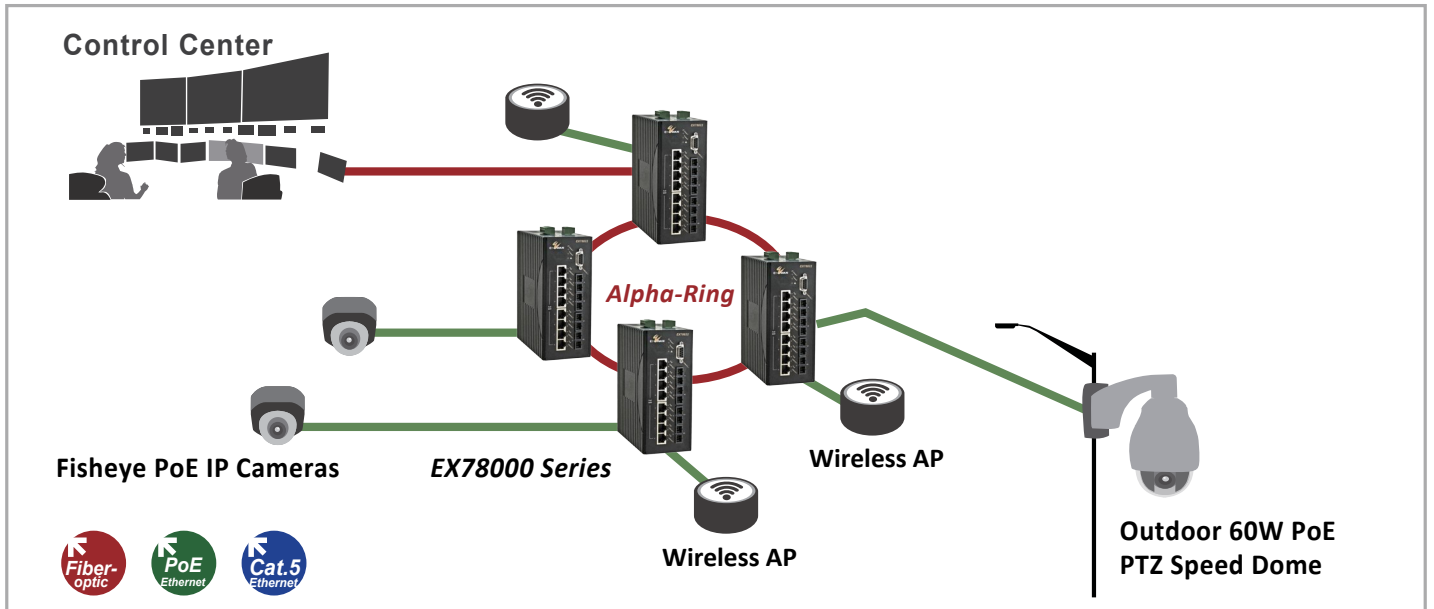
#### FED STD 101C Method 5007.1 (Free fall w/package)

### Industrial Compliance

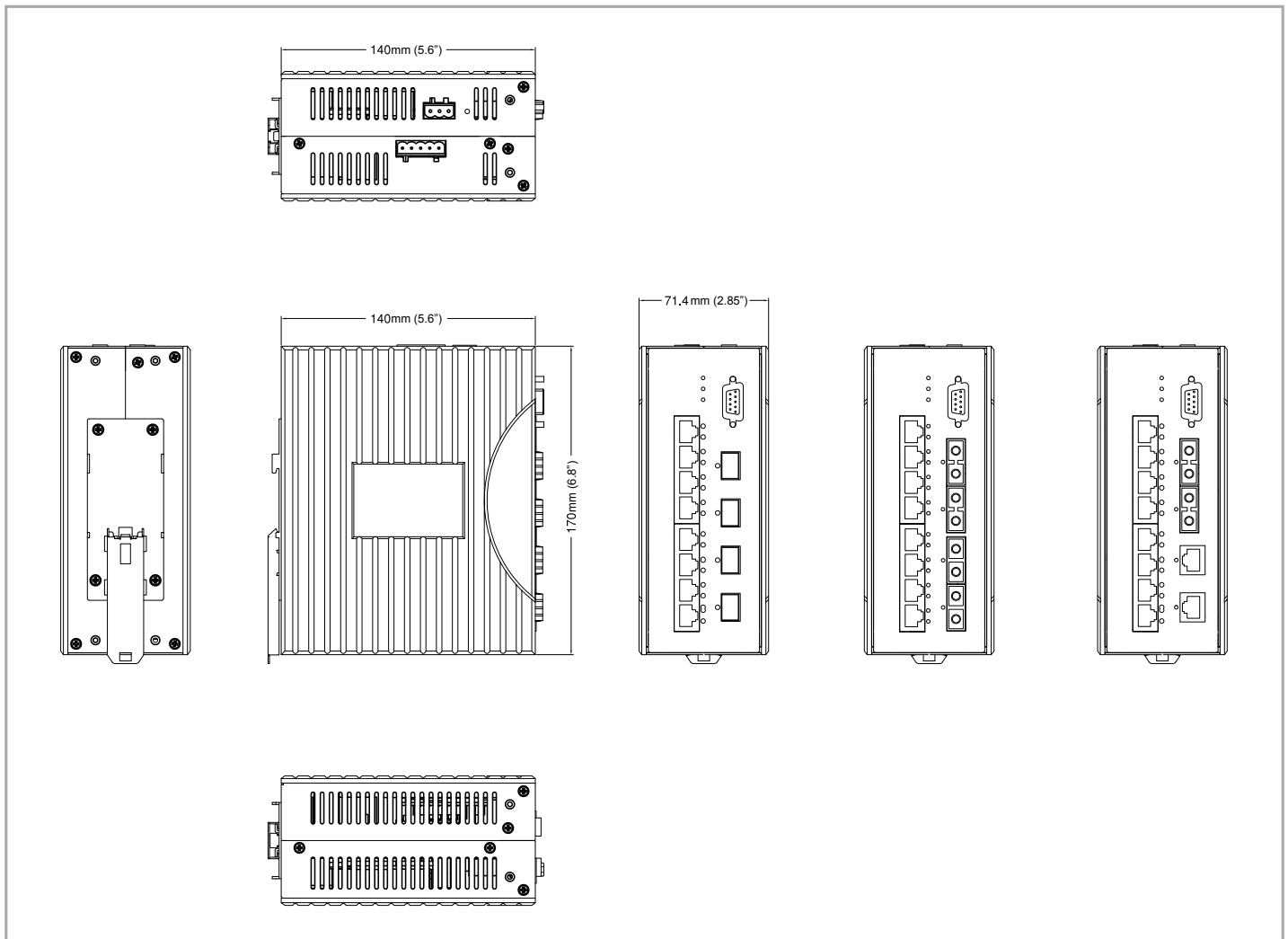
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#### NEMA TS2

# Application Diagram



# Dimensions



## Ordering Information

### Model

<b>EX78402-0YBT</b>	4-port 10/100BASE-TX PoE +2-port Gigabit Hardened Managed Ethernet Switch
<b>EX78802-0YBT</b>	8-port 10/100BASE-TX PoE +2-port Gigabit Hardened Managed Ethernet Switch
<b>EX78822-XYBT</b>	8-port 10/100BASE-TX PoE +2-port 100BASE-FX +2-port Gigabit Hardened Managed Ethernet Switch

\* DIN Rail mount included.

### 100FX Fiber Options (X)

<b>1</b>	Multi Mode (SC) - 2Km
<b>2</b>	Multi Mode (ST) - 2Km
<b>A</b>	Single Mode (SC) - 20Km
<b>V</b>	Support 2-port 100BASE SFP (DDM)

\* More 100FX fiber options also available upon request.

### Gigabit Port Options (Y)

<b>1</b>	10/100/1000BASE-TX
<b>3</b>	1000BASE-SX (SC) - 550m
<b>4</b>	1000BASE-SX (SC) - 2Km
<b>5</b>	1000BASE-SX (ST) - 550m
<b>A</b>	1000BASE-LX (SC) - 10Km
<b>R</b>	1000BASE-BX (SC) WDM-TX: 1310nm/RX: 1550nm-20Km
<b>S</b>	1000BASE-BX (SC) WDM-TX: 1550nm/RX: 1310nm-20Km
<b>V</b>	Support 2-port 100/1000BASE SFP (DDM)

\* More Gigabit options also available upon request.

### Optional Accessories

<b>NDR-120-48</b>	120W/2.5A DIN-Rail 48VDC Industrial Power Supply
<b>NDR-240-48</b>	240W/5A DIN-Rail 48VDC Industrial Power Supply
<b>SDR-480-48</b>	480W/10A DIN-Rail 48VDC Industrial Power Supply
<b>EB-232</b>	Configuration Backup and Restoration Tool