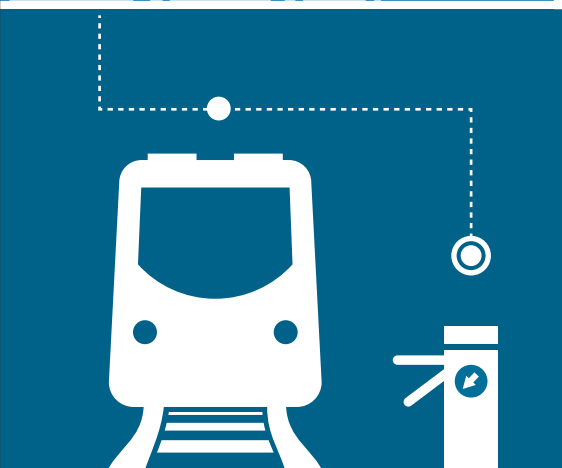


# Ethernet Connectivity

for Transportation

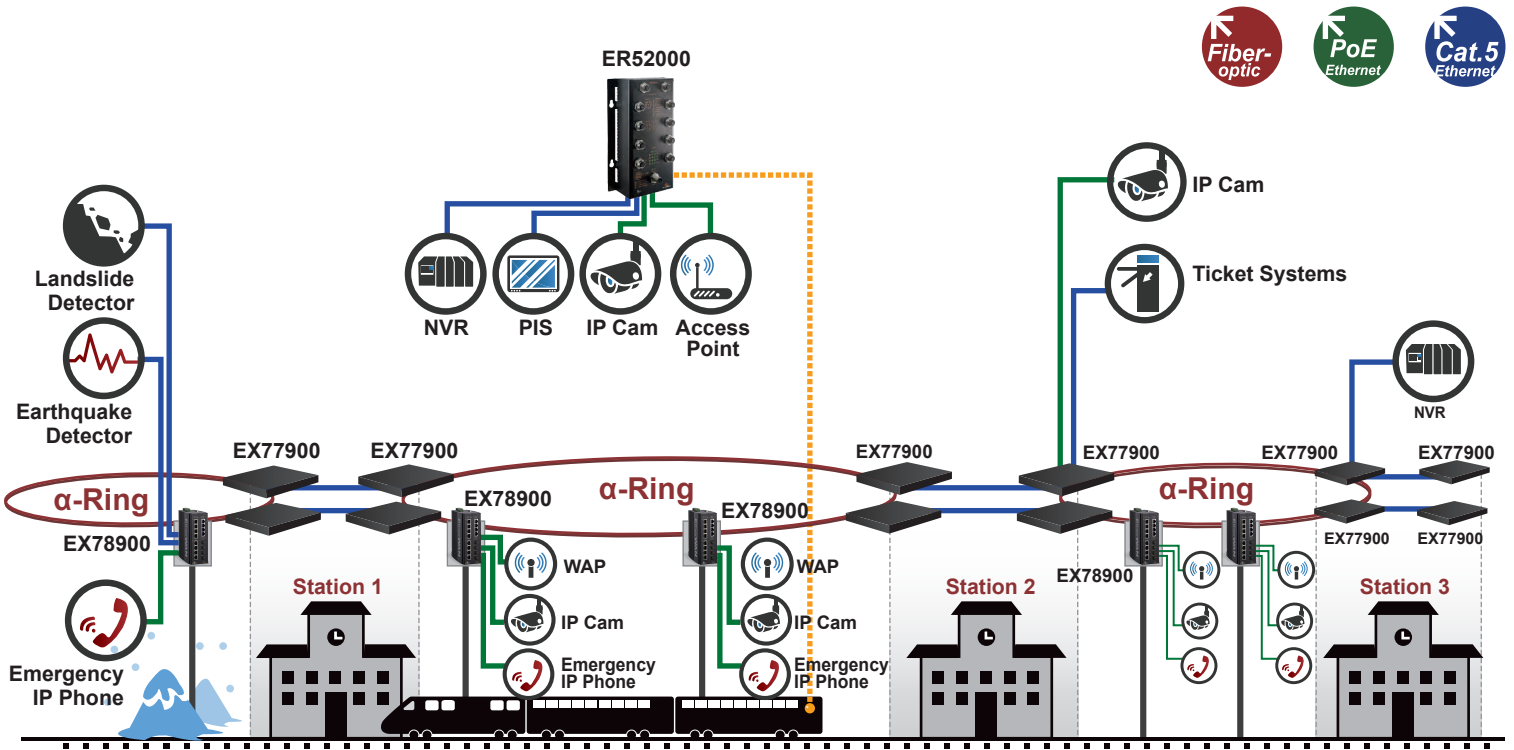
- ◆ Ethernet Switches
- ◆ Media Converters
- ◆ Ethernet Extenders
- ◆ Surge Protectors



- EN50121-4 / EN50155 compliant
- NEMA TS2 compliant

# Signaling Management for Wayside Surveillance

Rolling stock, traffic control, and security surveillance require mobile networks to collect vital information. Real-time data from Passenger Information Systems (PIS) and on board cameras are transmitted by wireless APs (WAP) from the train to wayside station WAPs upon arrival. High-power demanding PTZ speed domes cameras and WAPs along the wayside require greater power demand than non PTZ cameras and indoor WAPs. EtherWAN's EX78900 and EX78602 Series of Hardened Managed 60W PoE Switches provide 240W PoE power budget ideal for these power hungry outdoor devices eliminating the need for a separate power source. Preventing data loss is critical, EtherWAN's proprietary Alpha Ring redundancy protocol provides extremely fast network recovery in less than 15 milliseconds ensuring network communications.



## Selected Products

### EX78900

Hardened Managed 12-16-port (8 x PoE) Gigabit Ethernet Switch

#### Ultra PoE Switch

- » Up to 12 ports with 8 Ports PoE, support 60W / IEEE802.3af / at, and 4 Gigabit SFP ports for high-bandwidth communication

#### Intelligent Management

- » Optimize network performance with QoS, VLAN, and PoE scheduling, etc.

#### Remote Secure Access

- » IEEE802.1x, ACL and RADIUS support

### EX77900

IEC61850-3/IEEE1613 Lite L3 Hardened Managed 24-port Gigabit and 4-port 1G/10G SFP+ Ethernet Switch

#### 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

#### 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)

## Related Products



### EX70900

IEC 61850-3/IEEE 1613 Hardened Managed 8-port Gigabit Ethernet Switch



### EX45900

Hardened Unmanaged 5-port 10/100/1000BASE (4 x PoE) + 1-port 1000BASE-X Gigabit Ethernet Switch



### ER52000

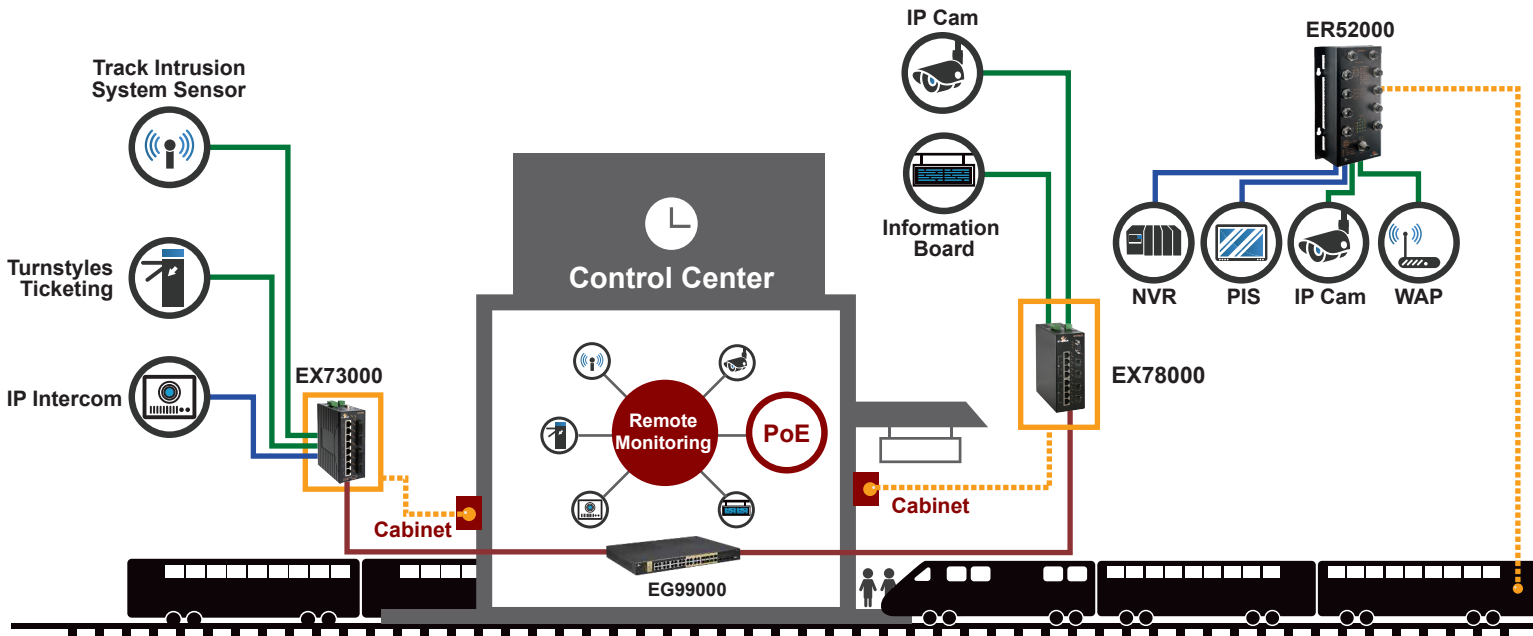
Hardened Unmanaged 8-port 10/100BASE M12 (8 x PoE) and 2-port Gigabit M12 Ethernet Switch

60W



# Passenger Help Points at Subway Transit

To enhance passenger safety and security, a major Metropolitan Subway Transit Bureau in the US decided to replace older Customer Assistance Intercoms (CAI) with new Help Point Terminals using the latest VoIP and Network technology. These new Help Point Terminals are positioned throughout the subway station for easy access and high visibility. Created specifically for the subway environment, the Help Points are designed to be easily recognizable for customers who need to report an emergency or ask for assistance. Travelers on the platform level of subway stations are provided immediate access to the station personnel.



## Selected Products

### EX78000

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

PoE power budget up to 60W/port (Ultra PoE), total 240W  
 » Ports 1 to 8 support IEEE802.3af/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



### EG99000

Hardened Managed 24-port 10/100/1000BASE-T (8-port combo SFP) and 4-port 10G SFP+ Layer 3 Switch

#### L3 Scalability

» Routing protocols such as RIP and OSPF for Layer 3 switching

#### Intelligent Management & Remote Secure Access

» Optimized network performance with QoS, VLAN, ACL and RADIUS support

#### Hardened Grade

» Wide operating temperature range for extreme environments  
 » Robust construction with ruggedized housing  
 » High impact and electrical noise resistance



## Related Products



**NEW**

### EX73900

IEC61850-3/IEEE1613 Lite L3 Hardened Managed 12-16-port Gigabit Ethernet Switch



### EX25611

Managed 24-port 10/100/1000BASE-T (4-port SFP Combo) and 4-port 1G/10G SFP+ Ethernet Switch

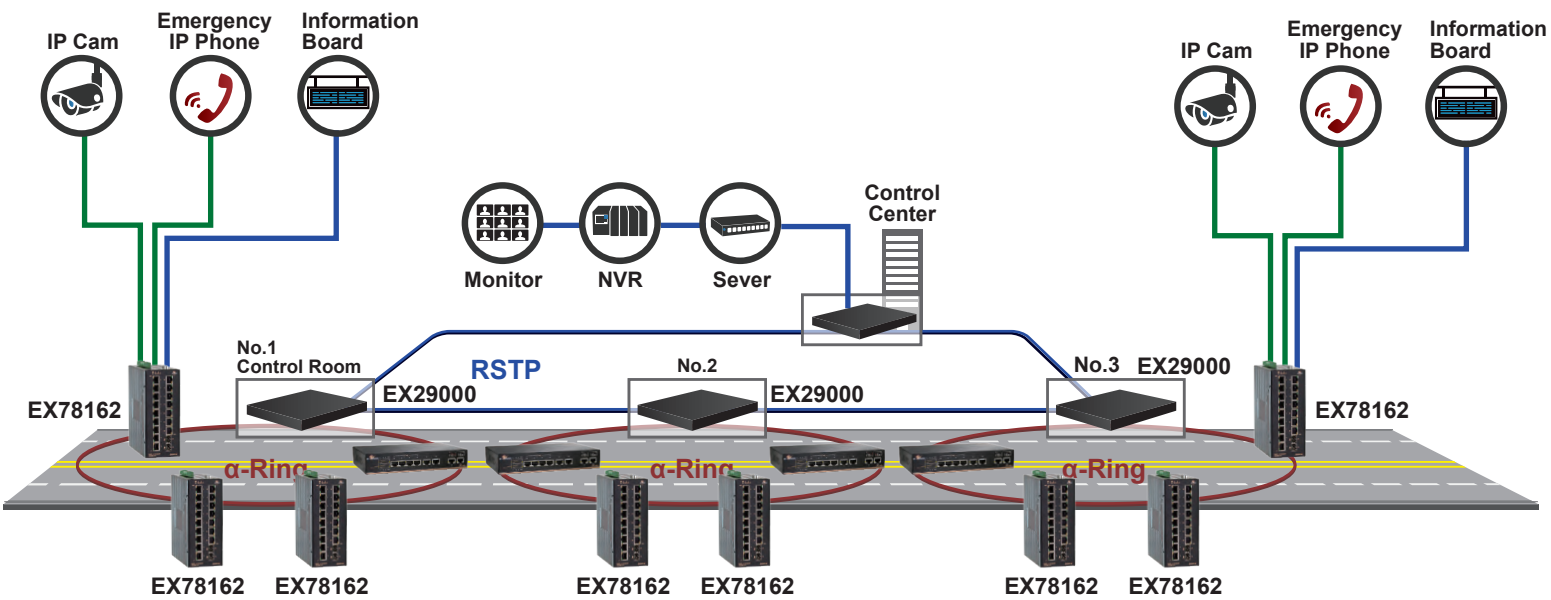


### EX26262F

Managed 24-port Gigabit PoE + 2-port 100/1000 SFP Combo Ethernet Switch

# Advanced Transportation Management Systems

A cross-county expressway in Japan is 60 kilometers in length, deployed with 80 cameras and 60 VoIP emergency phones. 4 Gigabit fiber optic redundant "Alpha Rings" loops are formed using 12 EX78000 Series Hardened PoE switches and 4 EX29000 Series Commercial Managed Ethernet Switches. The Rings interconnect the frontend CCTVs, VoIPs and the backend DVRs. The Alpha Ring redundancy protocol minimizes packet loss and ensures quick network recovery time in just milliseconds, resulting in stable operation of the expressway surveillance system.



## Selected Products

### EX77964

Lite L3 Hardened Managed 24-port Gigabit and 4-port 1G/10G SFP+ Ethernet Switch

#### 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)

#### 10GbE Connectivity

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

#### 19" Short Rack Mount Case

- » Depth of 254mm allows for installation in smaller enclosures



### EX29000

IEC61850-3/IEEE1613 Modularized Managed 4 to 24-port 10/100BASE and 4-port Gigabit Ethernet Switch with SFP options

#### Versatile Connectivity

- » Modularized Ethernet Switch of 24-port 10/100BASE-TX/FX/BX and 4-port Gigabit-TX/SX/LX/BX/SFP

#### Hardened Grade

- » Wide operating temperature range for harsh environments
- » Fanless and ruggedized housing
- » High shock and electric noise immunity



## Related Products



### EX78162

Hardened Managed 16-port 10/100BASE PoE and 2-port Gigabit Ethernet Switch



### EX41922T

Hardened Unmanaged 2-port 10/100/1000BASE PoE+2-port 100/1000 SFP Ethernet Switch

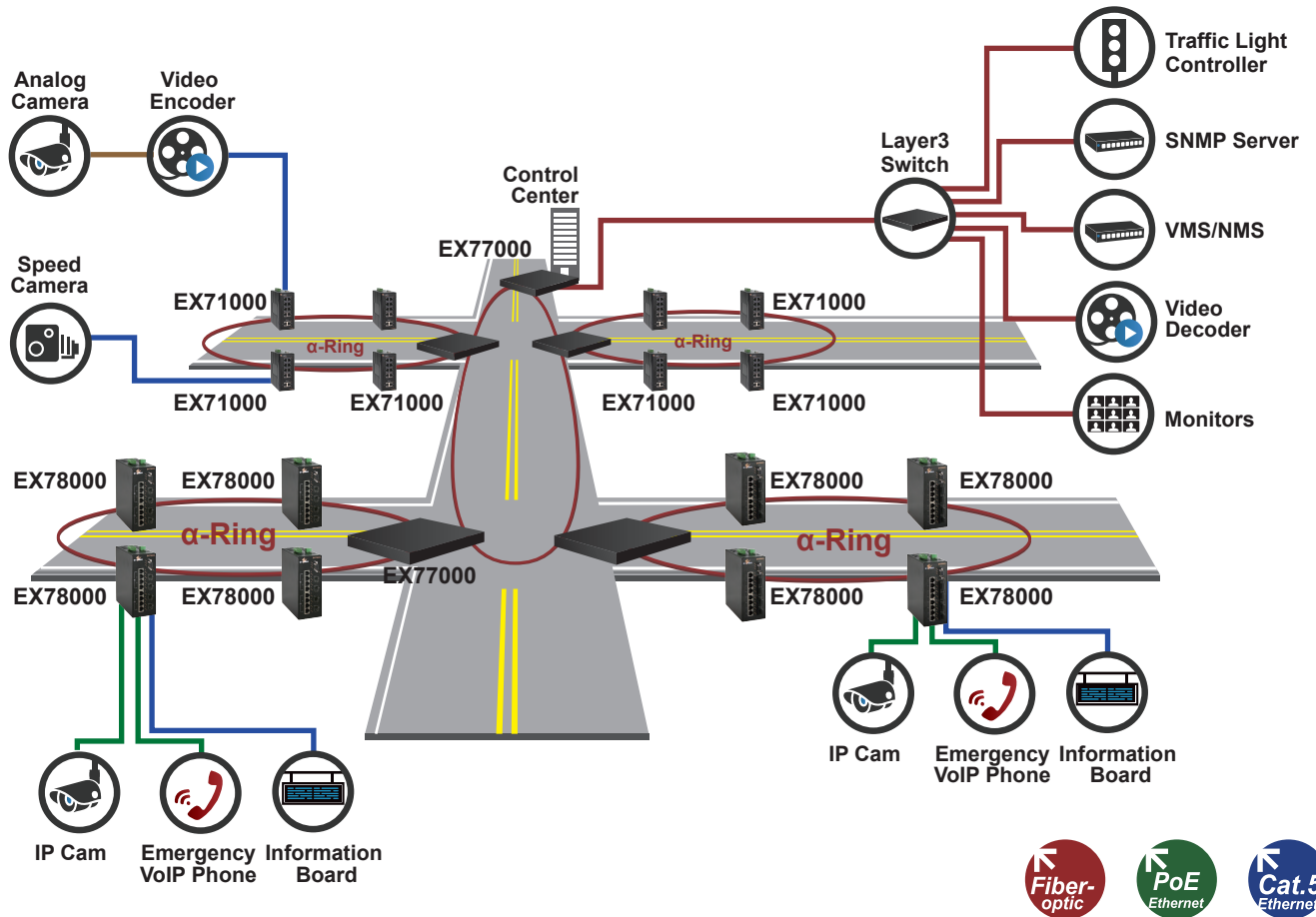


### EX89000

IEC61850-3/IEEE1613 Modularized Hardened Managed 24-port 10/100BASE and 4-port Gigabit Ethernet Switch with

# City Traffic Control

A major Texas city needed to upgrade their traffic intersection surveillance system while retaining many existing analog cameras. This new integrated system combines existing analog cameras, with new digital PoE IP cameras, and VoIP emergency phones, transmitting data via fiber optic infrastructure back to the Traffic Control Center (TCC). The TCC is now able to view, record, and respond to traffic situations and emergencies very quickly resulting in improved traffic flow, less congestion and quicker emergency team response.



## Selected Products



### EX71000

Hardened Managed 8-port 10/100BASE and 2-port Gigabit Ethernet Switch with SFP options

#### Versatile Connectivity

- » Provides 8-port 10/100BASE-TX/FX/BX/SFP plus 2-port Gigabit-SX/LX/BX/SFP

#### Intelligent Management

- » Wide operating temperature range from -40°C to 75°C (-40°F to 167°F) for extreme environments
- » Fanless and ruggedized housing

#### Secure Remote Access

- » IEEE802.1x, RADIUS support

### EX77000

Hardened Managed 24-port 10/100BASE and 4-port Gigabit Ethernet Switch with SFP options

#### Versatile Connectivity

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

#### Intelligent Management

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

#### Secure Remote Access

- » IEEE802.1x, ACL (Access Control List), and RADIUS support

## Related Products



### ED3538

Hardened 10/100BASE-TX PoL/PoE Ethernet Extender over Copper Wires



### EX63000

Industrial Managed 8 to 16-port 10/100BASE with 2-port Gigabit combo Ethernet Switch

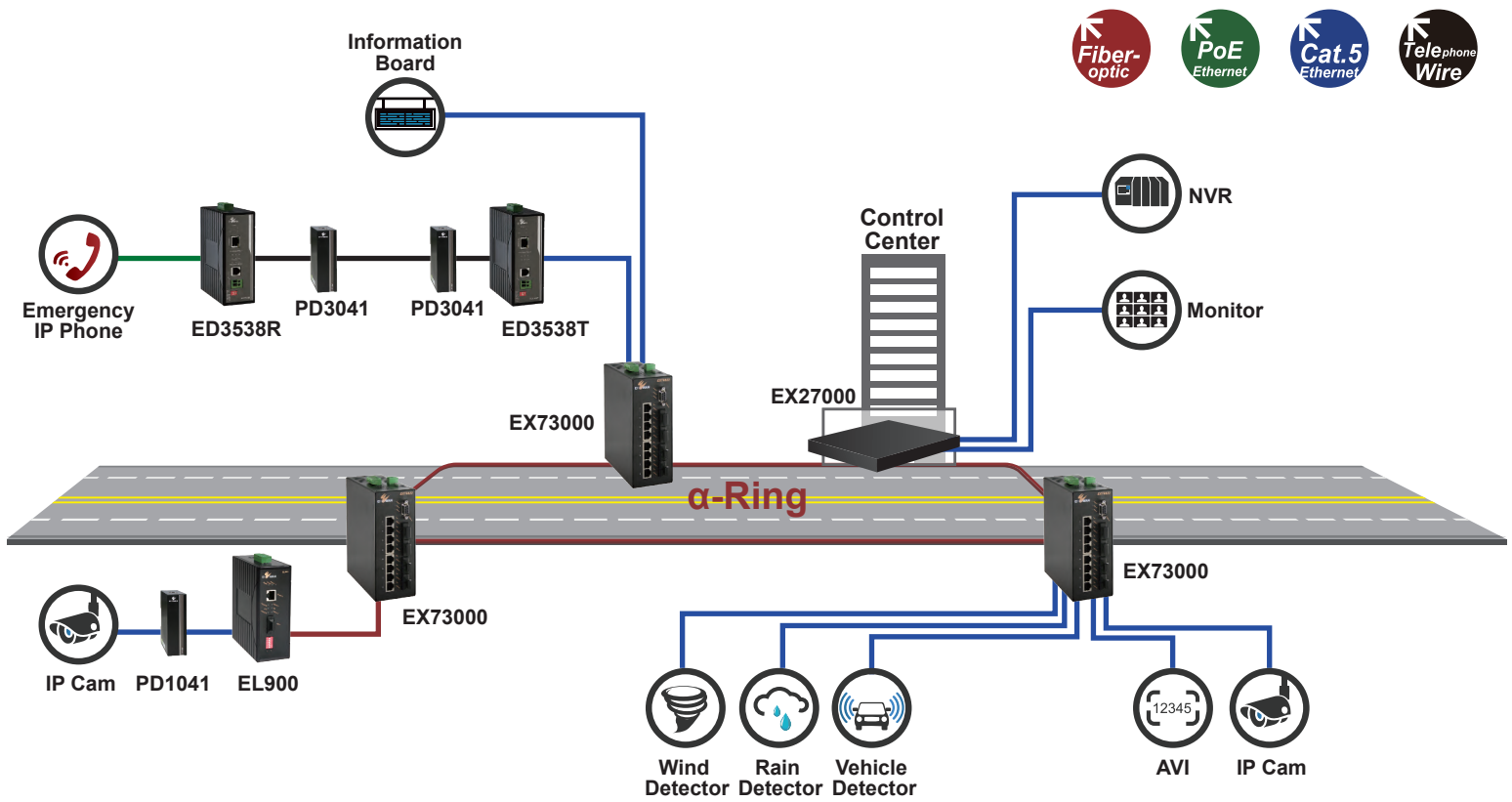


### EX42300

Hardened Unmanaged 4-port 10/100BASE (4 x PoE) + 1-port 10/100/1000BASE-T + 1-port 1000BASE-X Gigabit Ethernet Switch

# Highway Surveillance System

A central Taiwan national highway enhanced their traffic monitoring system by deploying EtherWAN EX27064-V0VT Ethernet switches in their data center. These aggregation switches connecting to outdoor Ethernet switches and Media Converters via fiber optics collect vital traffic and weather input. Data from AVI (Automatic Vehicle Identification), RD (Rain Detector), VI (Visibility Indicator), WD (Wind Detectors) and VD (Vehicle Detectors) provide real-time traffic information and weather conditions. The data is utilized to improve traffic flow and safety on the national highway.



## Selected Products



### EX73000

Hardened Managed 16-port 10/100BASE with 2-port Gigabit combo Ethernet Switch

#### Versatile PoE Connectivity

- » Provides 16-port 10/100BASE-TX plus 2-port Gigabit-SX/LX/BX.
- » Provides 8-port 10/100BASE-TX+4-port 100BASE FX Plus 2-port Gigabit-SX/LX/BX.

#### Hardened Grade

- » Wide operating temperature range from -40°C to 75°C (-40°F to 167°F) for extreme environments

#### Secure Remote Access

- » IEEE802.1x, and RADIUS support for extreme environments

### EX27000

EN50121-4 Managed 24-port 10/100BASE and 4-port Gigabit Ethernet Switch with SFP options

#### Versatile Connectivity

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

#### Intelligent Management

- » Wide operating temperature range for harsh environments
- » Fanless and ruggedized housing
- » High shock and electric noise immunity

#### Secure Remote Access

- » IEEE802.1x, ACL (Access Control List), and RADIUS support



## Related Products



### EL900

Hardened 10/100BASE-TX to 100BASE-FX Media Converter



### PD1041

Hardened Surge Protection Device - RJ45



### PD3041

Hardened Surge Protection Device - RJ11 & Two Wire Terminal Block Type



### ED3575

Hardened Managed 6-port 10/100BASE-TX + 2-port Gigabit combo SFP Switch with 2-port Copper Pair Ethernet Extender



### ED3541

Hardened 10/100BASE-TX Ethernet Extender



### ED3501

Industrial 10/100BASE-TX Ethernet Extender



Model Name	EX71000 / EX73000	EX73900 / EX78900	EX78000	EX78162	NEW EG99000	EX77900	NEW EX77964	EX77000	NEW EX41922T
Interface									
Max. 10/100BASE	8 / 16	-	8	16	-	-	-	24	-
Max. 10/100/1000BASE	2	12 / 12	2	-	24	24	24	4	2
Max. PoE	-	- / 8 (60W)	8 (60W)	16 (30W)	-	-	-	-	-
Max. 100BASE SFP	4 / -	- / -	2	-	-	-	-	-	2
Max. 1000BASE SFP	2 / -	4 / 4	2	2	8	8	8	4	2(100/1000SFP)
Max. 10G SFP+	-	-	-	-	4	4	4	-	-
Mechanical									
Installation*	D, P, R / D, P	D, P	D, P	D	R	R	R	R	D
Power Input									
No. of Power Input	2	2 / 2	2	2	2	2	2	2	2
110 - 240VAC	-	-	-	-	✓	✓	-	✓	-
Terminal Block	12 ~ 48VDC	12 ~ 48VDC / 52 ~ 57VDC	52 ~ 57VDC	52 ~ 57VDC	48VDC	48VDC	48VDC	48VDC	52 ~ 57VDC
DC Jack	-	-	-	-	-	-	-	-	-
Operating Temperature	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C
Network Redundancy									
α-Ring / α-Chain	✓	✓	✓	✓	✓	✓	✓	✓	✓
STP / RSTP / MSTP	✓	✓	✓	✓	✓	✓	✓	✓	✓
Network Mgmt & Ctrl									
	VLAN, QoS, IGMP, GMRP, Bandwidth Rate Control, LACP, Port Trunking, Port Mirroring, Packet Filtering, IEEE802.1x Security, DHCP Server, DHCP Client, SNMP (v1, v2c, v3), RMON, Web Management, Telnet Management, RS-232 Console Management, SSH / SSL								
Static Routing, RIP V1/V2	-	✓	-	-	-	-	-	-	-
Regulatory Approvals									
CE / FCC / VCCI	✓	✓	✓	✓	✓	✓	✓	✓	✓
UL61010 / UL62368	UL 61010	UL 62368	UL 61010	-	UL 62368	UL 62368	UL 62368	-	UL 61010
ISA12.12.01 / UL1604	- / ✓	-	-	-	-	-	-	-	-
IEC61850-3 / IEEE1613	-	✓ / -	-	-	-	-	-	-	-
EN50155	-	-	-	-	-	-	-	-	-
EN50121-4	✓ / -	-	-	-	-	-	-	-	-



Model Name	ER52000	EX42300 EX45900	EX46900A
Interface			
Max. 10/100BASE	8 (M12)	4 (EX42300)	-
Max. 10/100/1000BASE	2 (M12) Bypass	1 (EX42300) 5 (EX45900)	8
Max. PoE	8 (30W)	4 (30W)	8 (30W)
Max. 100BASE SFP	-	-	-
Max. 1000BASE SFP	-	1	2
Mechanical			
Installation*	W	D	D
Power Input			
No. of Power Input	2	2	2
110 - 240VAC	-	-	-
Terminal Block	M12: 72 ~ 110VDC	18 ~ 57VDC	18 ~ 57VDC
DC Jack	-	-	-
Operating Temperature	-40°C ~ 75°C	-40°C ~ 75°C	-40°C ~ 75°C
Network Redundancy			
α-Ring / α-Chain	-	-	-
STP / RSTP / MSTP	-	-	-
Network Mgmt & Ctrl			
	-	-	-
Regulatory Approvals			
CE / FCC / VCCI	✓	✓	✓
UL61010	-	✓	✓
ISA12.12.01 / UL1604	-	-	-
IEC61850-3 / IEEE1613	-	-	-
EN50155	✓	-	-
EN50121-4	-	-	-
EN50121-3-2	✓	-	-
E Marks	-	-	✓

Power over Link	ED3538 / ED3638	ED3501	ED3541	ED3575
Interface				
10/100 BASE-TX	1	1	1	6
Max. PoE Ports	1 (30W)	-	-	-
Extension Interface				
RJ-11	RJ11 (ED3538)	1	1	2
BNC	BNC (ED3638)	-	-	-
Mode of Operations				
Auto-negotiation, Auto-MDI/MDI-X	✓	✓	✓	✓
Store & Forward	✓	✓	✓	✓
Mechanical				
Installation*	D, P, R	C, D, W	D	D
Power Input				
No. of Power Inputs	3	1	2	2
Terminal Block	46 ~ 57VDC	-	12 ~ 48VDC	12 ~ 48VDC
DC Jack	48VDC	12VDC	-	-
AC to DC Adapter	-	✓	-	-
Operating Temperature	-40°C ~ 75°C	-10°C ~ 60°C	-40°C ~ 75°C	-40°C ~ 75°C
Regulatory Approvals				
CE / FCC / VCCI	✓	✓	✓	✓
UL/cUL 60950-1	✓	✓	✓	✓

Data Rate (min. Rate)	ED3538 (Pair of 24AWG copper wire)		ED3638 (RG6 coaxial cable)		ED3501	ED3541	ED3575
	Distance	PoE PWR Out	Distance	PoE PWR Out	Distance	Distance	Distance
100Mbps	300m(984ft.)	30.0W	400m(1312ft.)	30.0W	300m(984ft.)	300m(984ft.)	300m(984ft.)
80Mbps	400m(1312ft.)	15.4W	600m(1968ft.)	15.4W	400m(1312ft.)	400m(1312ft.)	400m(1312ft.)
40Mbps	1000m(3280ft.)	7W	1200m(3937ft.)	8W	800m(2624ft.)	800m(2624ft.)	800m(2624ft.)
20Mbps	1200m(3937ft.)	5W	1600m(5249ft.)	6W	1200m(3937ft.)	1200m(3937ft.)	1000m(3280ft.)
1Mbps	N/A	N/A	N/A	N/A	2600m(8530ft.)	2600m(8530ft.)	2600m(8530ft.)

\* D: DIN-Rail Mounting, P: Panel Mounting, R: Rack Mounting, W: Wall Mounting

\* All speed selections are Symmetrical on the DSL and Full duplex on the Ethernet  
 \* The data rate may vary according to line quality

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